

Madrona Elementary Walking Audit



Highline School District



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Overview of Program

Communities Putting Prevention to Work: Madrona Elementary School, Highline School District

Safe Routes to School (SRTS) is a growing movement to encourage and support “active commuting” by school children and families. At the intersection of public health, public safety, education, and transportation, SRTS helps communities create a balanced alternative to an automobile-centered culture. Safe Routes to School programs break barriers and solutions into their “5 E” components: Education, Encouragement, Enforcement, Engineering, and Evaluation. In short, the goal of Safe Routes to School program is to encourage kids to walk and bike safely to school, where it is safe. And where it’s not safe, to make it safe.

Why Encourage Kids to Walk and Bike to School?

Increasing kids’ physical activity lowers obesity rates, improves lung-related health, and enhances readiness to learn by lowering stress levels. However, over the past generation activity levels have dropped and obesity rates have risen; the share of students who walk or bike to school has fallen from 48% to 13%, while childhood obesity rates have tripled. This change has serious consequences; obesity’s role in diabetes and heart disease make it one of the two leading causes of preventable death in King County.

What is the Communities Putting Prevention to Work Grant?

The Communities Putting Prevention to Work Grant (CPPW) is a national initiative to prevent chronic disease and promote health through policy, systems and environment changes. King County was awarded grant funding through the Centers for Disease Control & Prevention (CDC) to promote healthy eating, active living, and tobacco cessation.

Under the CPPW Safe Routes to School program, Madrona Elementary (and 17 other schools throughout South King County) will:

- identify safe and unsafe areas for biking and walking
- identify safety improvements
- prioritize desired improvements to acquire future funding
- train PE teachers to deliver a safe walking and biking curriculum
- educate students on safe walking and biking practices
- hold events to encourage children to walk and bike

Who is involved in the Safe Routes to Schools Program?

Safe Routes to Schools programs rely on a diverse group of participants. Under the CPPW program, the primary participants are:

- The Bicycle Alliance of Washington: The Bicycle Alliance is a non-profit state leader in SRTS. It is coordinating the CPPW countywide SRTS efforts, designing the teacher training and student curriculum, providing bikes for kids to use in PE, and providing technical advising.
- Feet First: Feet First is a non-profit which promotes walkable communities throughout Washington. It is leading walking audits and developing maps for the CPPW schools.
- Highline School District: The district applied for CPPW SRTS funding in conjunction with other CPPW funding for healthy eating and active living efforts.

- City of SeaTac: The City is pursuing its own CPPW projects on citywide pedestrian and bicycle transportation, and participated in the walking audits.
- Parents and students: Parents and students are key to sharing their knowledge of their community's assets and barriers.

What is a walking audit?

A walking audit is an opportunity for community members to gain firsthand experience of students' walking environment and to jointly develop improvement strategies. Parents, students, school staff, district transportation and health staff, city staff, and other community members walk commonly used routes and take notes on the experience. The recommendations can often be incorporated into other schools in the district.

What is in this report?

This report includes the following sections:

- Methodology – information on how the audit was conducted, to help repeat the process at other schools
- List of Participants
- Overview of the School
- Brief Notes On School Parking Lots And Bicycling – the focus of this audit is on walking trips, not car or bike trips. Instead, brief observations are recorded here; future projects could look in more depth at these travel modes.
- Top Observations & Recommendations – because of the large number of participant's observations, Feet First has identified the key observations and recommendations. These observations are highlighted and illustrated in the full list of Field Notes.
- Walk Route and Field Notes – All observations and photographs are provided here.
- Appendix I – Crime Prevention Through Environmental Design – A more detailed level of discussion has been included regarding the dead end at 202nd Street, due to the level of discussion generated during the walk.
- Appendix II – Bike Parking Guidelines – a brief overview on improving bike parking.

Methodology

- 1) *Information gathering*: Feet First and the Bicycle Alliance met with district and school staff to gain an understanding of where students live, where they go after school, and the biggest challenges facing walkers and bikers. The list of interview questions is attached in the appendix.
- 2) *“Ground-truthing”*: Feet First visited each neighborhood and compared map data and in-person observations. Notes and photographs were taken on pedestrian infrastructure-related assets and issues. Based on these observations, points of interest were chosen and maps were prepared for the community walking audits.
- 3) *Scheduling*: Dates were set for the audit based on availability of the Highline School District participants, community partners, and primary school contacts. The audit was conducted at the end of the school day on February 15, 2011 to observe the dismissal process, and lasted one and one-half hours.
- 4) *Outreach*: The school and district invited parents, city staff, and other community to participate. The Bicycle Alliance and Feet First provided fliers and newsletter copy for outreach.
- 5) *Group participation*: Audit participants were given maps, clipboards, and digital cameras. They recorded their observations by writing on the maps and taking photographs.
- 6) *Reporting*: Feet First collected the comments and cameras, then compiled the findings into this report. The report was circulated among the city, district, and school staff for review.

List of Participants

In order to gather participants for the community walking audits, the community schools collaboration project manager, Melissa Morin, worked diligently with principals, faculty, and staff at Madrona to gather parents, neighbors, city staff, and concerned citizens. The Bicycle Alliance of Washington and Feet First created and e-mailed fliers to the school’s main contacts, city planners, engineers, transportation specialist, and the police department. They also met in person with city staff.

Madrona Elementary Community Walking Audit participants included:

Gisella Del Rosario	Parent	Shelley Dean	Student
Larry Ellis	City of SeaTac Assistant Parks & Recreation Director	Kaya Nieves	Student
Katie Kaehny	City of SeaTac - Associate Planner	Bella Jacobson	Student
Anne Antonini	City of SeaTac – CPPW Program Coordinator	Sadie Olson	Student
Bernie Dorsey	Highline School District	Samantha Yee	Student
Paul Cooke	Rotary Club	Elizabeth Platn	Student
Valerie Allan	Highline School District	Claire Ingalls	Student
Lauren Donlin	Highline School District		
Derek Byrne	Highline School District		
Kathy Allen	Highline School District		
Scott Logan	Highline School District		
Emily Baker	Student		
Carsyn Willams	Student		
Brooke Auvil	Student		

Bicycle Alliance of Washington, Communities Putting Prevention to Work:
Safe Routes to School Program Manager – John VanderSluis
Feet First Executive Safe Routes to School Coordinator – Jen Cole
Feet First Active Communities Mapping Specialist – Gia Clark

Overview of Madrona Elementary School

Madrona Elementary serves approximately six hundred pre-school/kindergarten-6th grade students from the City of SeaTac. The school has a rich cultural diversity: over half of the students are of Hispanic origin, a fifth are African American, an eighth are Asian, and a tenth are Caucasian. Half of the students are English language learners, and over nine-tenths qualify for free or subsidized school lunches. The school is located at 20301 32nd Avenue South, SeaTac, Washington. Some of the great assets available to Madrona Elementary are the school's active and dedicated staff, and its relationships with community service groups and the city. While the surrounding neighborhood can be challenging for walkers and bikers, on-campus physical activity is promoted through a grant-funded running track, participation in Cascade Bicycle Club's bike training program, and well-designed sidewalks at the school's perimeter.

Notes on School Parking Lots

School drop-off and Pick-up areas often pose particular difficulty for students getting to school. The combination of high numbers of family vehicles, yellow bus service, pedestrians, and bicycle traffic can make the final approach to the school difficult for students and adults alike.

A general rule of thumb is to make a clear separation between different travel modes by having discrete areas dedicated to bus loading, family vehicles, and bicycle & pedestrian access. Signage and curb striping should be unambiguous, schools should distribute information that clearly states the school procedures, and adequate staffing should be provided to supervise each area.

It is outside of the scope of this walking audit to do an in-depth analysis of student drop-off and pick-up procedures for each school. However, some general observations about the school ground and drop-off & pick-up routines are noted here.

Notes on Bicycling in the Area

During the audit, participants identified three main barriers to cycling: risk of theft, families' inability to purchase bikes, and lack of riding space away from traffic. Several positive aspects were also identified, including the relatively flat topography, the high economic need for non-automotive transportation, the presence of a cycling club for older youth (Cascade's Major Taylor program), and a strong desire to ride (several students bring their bikes to school even though they are only allowed to ride a block before dismounting at campus).

Several measures could be taken to address the barriers to biking. These include:

Improving the bike parking facilities: Madrona provides better bike parking than many other schools; the rack is solid, can be locked to bike frames, and is anchored firmly in the ground. However, the rack is located far from the school and watched by security cameras rather than human eyes, which is a disincentive to ride when theft is high. Consider creating bike storage space in a locked room inside the school, or in the gated area attached to the west side of the school. This would have the added benefit of protecting the bikes from the rain, which extends the life of the bike. Consider asking the new apartment owners to develop secure space for bike storage.

Increase opportunities for bicycle and helmet purchase: The school could work with local rotary groups to donate bikes and helmets directly or through an earn-a-bike program, and to connect parents to subsidized helmet programs. Other programs have found a wealth of bikes in their communities that just needed minor repairs to be rideable.

Creating dedicated space for cycling: Marking painted bike lanes benefits all road users by slowing traffic. The school could work with the city to designate bike lanes around the school. Additionally, working with property owners to allow north-south travel through private property would allow kids to walk or bike without traveling along high speed SR 99.

Madrona Elementary Walking Audit

Walking Audit route: see attached map route.

Walking Audit Top Observations

Crime stemming from SR 99 is very much a reality for the neighborhood and should be constantly considered when addressing student safety. Organized Safe Routes to School programs can provide a safe way for students and adults to walk or cycle together and reclaim enjoyable use of their community.

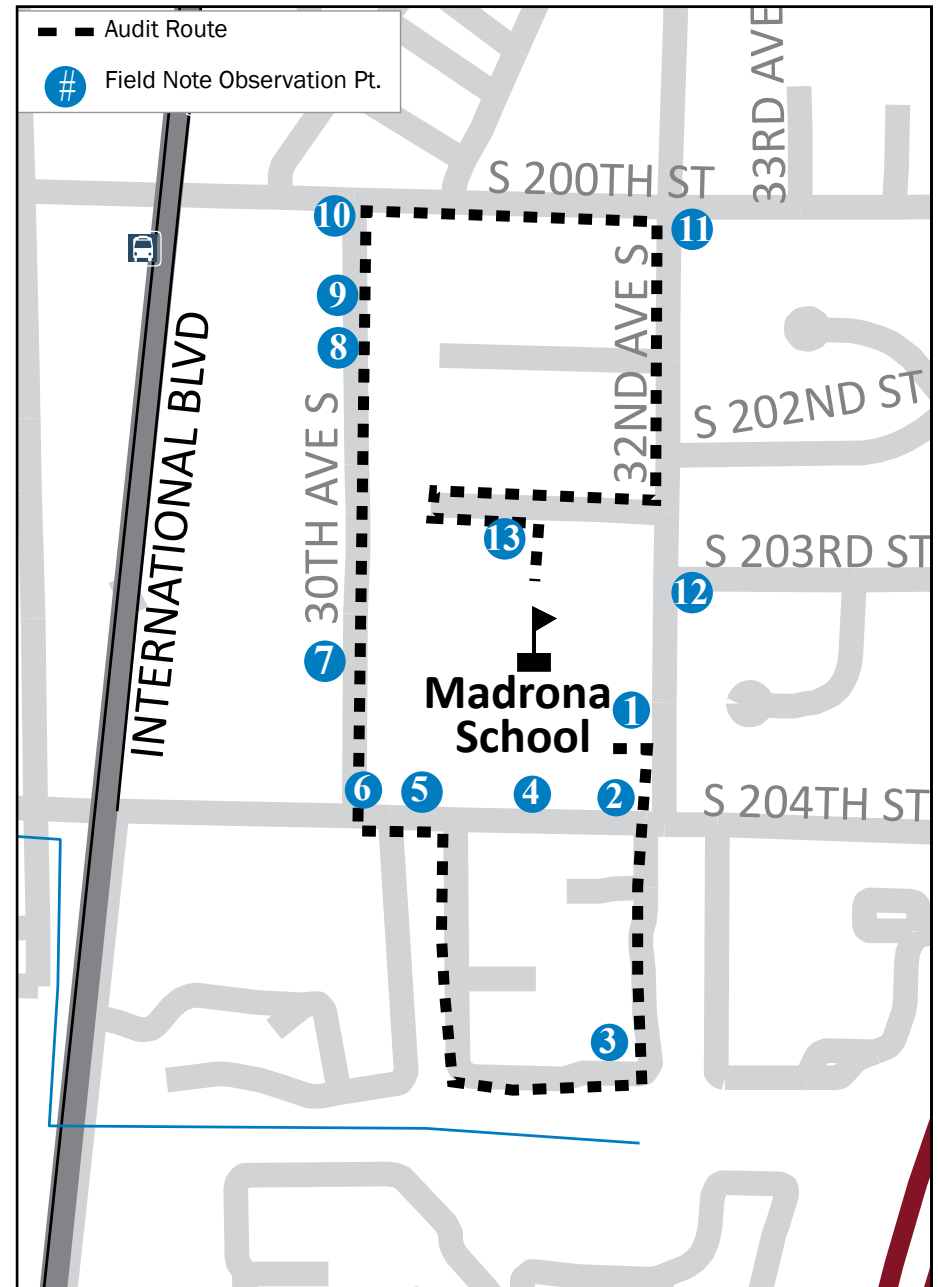
While it is very easy to drive to and around this area, the lack of sidewalks, crosswalks, and other pedestrian facilities make it much more difficult to travel safely by foot. The school campus itself has clearly designated paths and entries for pedestrians, but by and large those options end at the edge of the school grounds.

The apartment complexes to the south of the school are designed primarily for access by car, and are divided by fences and other barriers that prevent pedestrian access between properties. Several persistent footpaths created through and under fences demonstrate the clear desire by residents to walk through and between these sizable properties.

Walking Audit Top Recommendations

1. Apartment Connector Path: Host a community forum with apartment owners to address the need for pedestrian pathways between apartment properties. Students continue to use this cut-through despite the efforts of property owners to keep students out. Work with apartment owners to allow walking in this area, making the effort to create a safe walking area for students. (see field note observation pt. #3)
2. South 204th Street at the bus exit from school grounds: Participants, students and school staff on the walking audit voiced significant concern regarding this location. Students cross in large numbers to enter the

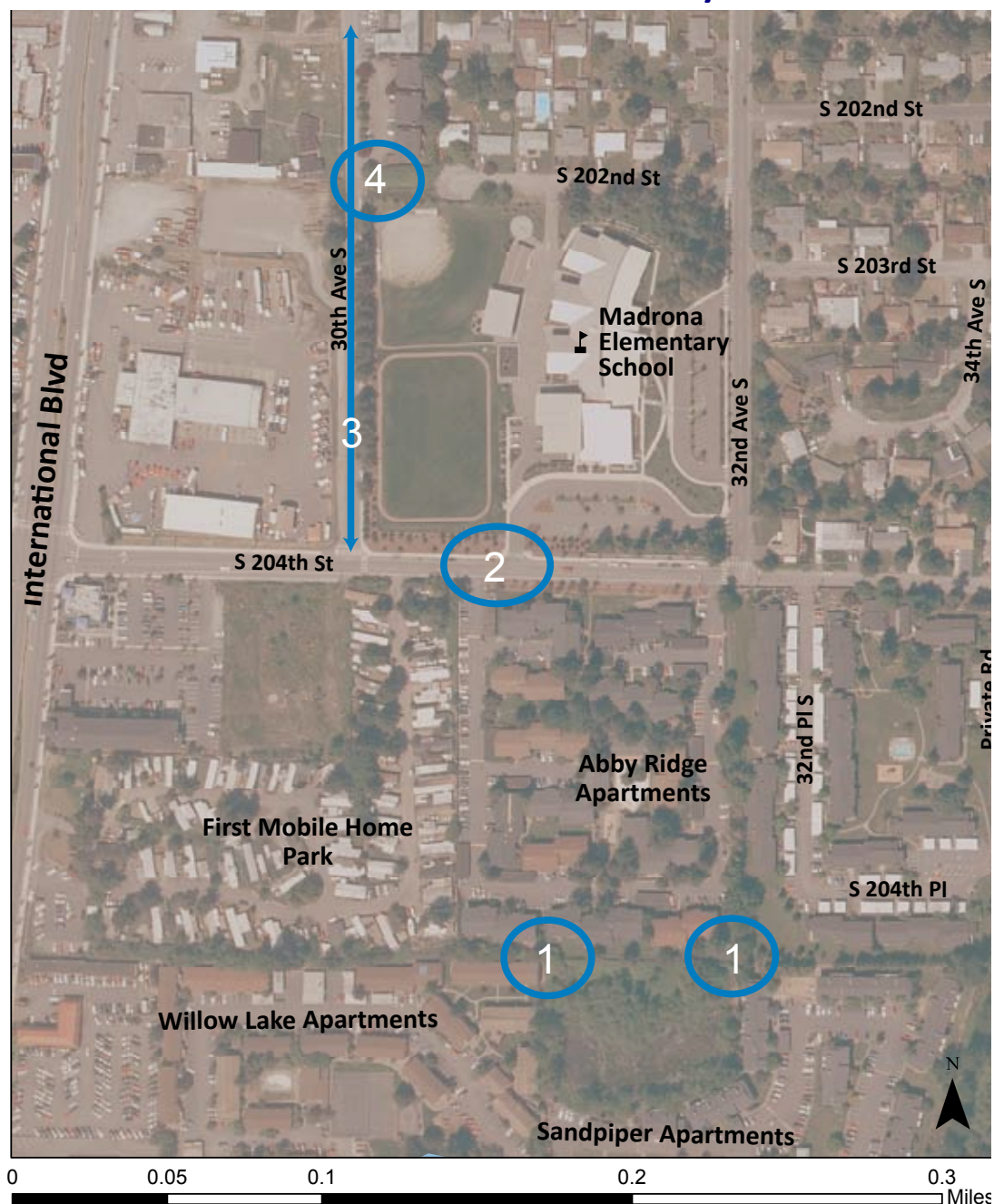
Field Observation Points - The numbers on the map below correspond to the field observations made by participants on the walking audit route. See the Walking Audit Field Notes (page 6) for detailed information about each location point.






Recommendations for Madrona Elementary School





apartment complex across the street. Work with city officials to determine if this is a suitable place to install a mid-block crossing, and enforce the no parking restrictions along South 204th Street. An adult crossing guard at this location is critical. (see field note observation pt. #5)




3. 30th Avenue South: Work with city officials to determine if this area can be designated with lower speed zones, and reduce traffic speeds with possible traffic calming measures such as a flashing beacon. (see field note observation pt. #7)
4. 30th Avenue South dirt cut path/berm: As it stands, the path neither encourages walking, nor meets Crime Prevention Through Environmental Design standards (CPTED). Instead, commit to one of two strategies: 1.) reclaim the space to allow pedestrian & bike passage, or 2.) eliminate all public access. Please see the CPTED findings at the end of this report. (see field note observation pt. #8)






Madrona Elementary Walking Audit Field Notes

Observation Pt.	Intersection	Community Asset	Engineering	Enforcement	Education	Encouragement	Policy	Field Observations	Recommendation	Image
School 1	grounds					x		The school campus is designed with clear and separate areas for bus loading, personal vehicles and bicycle/pedestrian pathways. Because of the high volume of drivers, there is often a line up of cars at the drop-off/pick-up location, with students often walking through lanes of idling vehicles to reach their family cars. Many middle school students walk younger students home and wait outside the elementary school outside the front door.	Encourage people to walk more to alleviate volumes of cars in the lot. If not already in place, the school safety committee should determine desired drop-off/pick-up routes for drivers and pedestrians and communicate those to parents each school year. This can be done in the fall newsletter. Indicate to drivers the appropriate pick-up locations by creating a sign and placing it in a prominent position to assist drivers. It may be beneficial to use the area on 30th Ave S. as an alternate pick-up/drop-off zone for students. However, that should only be done in the context of a comprehensive analysis with school transportation and safety experts.	
32nd Ave S and S 204th St			x					Both crosswalks at this location lead pedestrians from the school campus to areas without sidewalks. The marked crosswalk across 204th St leads pedestrians to a conflict point with the driveway for the apartment complex. The stop sign is placed far back from the crosswalk with the driveway in between.	Station an one to two adult crossing guards at this location on either side of the road..	
Abbey Ridge Apartment complex	parking							The apartment complexes to the south of the school are not designed for pedestrian safety or comfort. The apartment layout and parking design instead prioritizes car access. This is not an inviting or safe place for kids to walk or bike.	Work with the school district and the apartment owners to collaborate on ways to improve the walking environment.	
Abbey Ridge Apartment complex	parking							The presence of several shopping carts near a garage indicates that people walk to and from the grocery store, which participants explain is quite far away. This is evidence of a need for improved pedestrian facilities		

Observation Pt.	Intersection	Community Asset	Engineering	Enforcement	Education	Encouragement	Policy	Field Observations	Recommendation	Image
3 Top Recommendation	Abbey Ridge Apartment Complex connection to south (a)		x		x		x	There are several cuts in the chain link fence between two apartment complexes where kids cut through to get from home to school and back. By cutting through here, students reduce their walk to school by over a half-mile, avoiding traffic hazards along the way. Currently, apartment maintenance discourages students from using these routes by creating barriers and obstacles. Despite the time, effort and financial investment of the apartment maintenance department, students continue to make their way through the paths, often cutting holes in fences as well as digging holes underneath fence posts.	Host a community forum for apartment owners, residents, schools and city planners. The community should decide if there is a better solution to the apparent desires to both walk through these areas and deter crime.	 
3	Abbey Ridge Apartment Complex connection to south (b)		X		x		x	Walking audit participants scaled this retaining wall and exited into the muddy parking area -- impressive! One of the first rules-of-thumb in Safe Routes to School is to find the safest route to your destination. If a sanctioned pathway were to be opened between apartment complexes, this area would either need to be avoided or improved.		
3	Apartment complex parking/connection to south		x		x		x	The Abbey Ridge apartment complex hopes to modify sidewalks this summer. The new owners have been working to fix the mold problem and seem like they could be potential partners in creating safe routes for the students that live in their complexes.	Work with apartment owners and managers to create walkways for students through apartment complex.	

Observation Pt.	Intersection	Community Asset	Engineering	Enforcement	Education	Encouragement	Policy	Field Observations	Recommendation	Image
4	S 204th St - all along between 30th Ave and 32nd				x	x	x	Parents, in an effort to avoid entering the school grounds and the chaotic drop-off/pick-up area, drop off students along 204th St. The students then cut up through the school grounds and through the bus area. Often they walk through and between the buses.	A short term suggestion would be to block off the area with cones so that students do not cut through the bus parking area. A more sustainable solution may come from working with district transportation and safety experts to conduct a comprehensive drop-off/pick-up plan and communicate it clearly to school families.	
5 Top Recommendation	S 204th Bus exit from school		x				x	The crossing between the school grounds and the apartment complex just across the street is not marked. There is an adult crossing guard here to help students cross the street.	Work with city officials to determine if this is an appropriate place to install a mid-block crosswalk, which would provide direct access to the pedestrian pathway to school. In addition to installing a cross walk city officials can work to install a sidewalk along the south side of S 204th Street. An adult crossing guard at this location is critical.	
6	S 204th St at west entrance to apartment complex							Cars that are parked along S 204th St can block visibility of the crossing of point into the west apartment complex entrance.	With a marked crosswalk at this location, parking would not be allowed within 20 feet.	
7 Top Recommendation	30th Ave between S 204th St and S 200th St							Cars travel at high speeds on this stretch of road, which is often used as an alternative to International Blvd. (SR99). The road is wide and has no traffic-calming signage or infrastructure. The sidewalk on the east side does not extend beyond the school property, and there is no sidewalk on the west side of the road.	Work with city officials to determine if this area can be designated with lower speed zones as well as reducing speed threshold with possible infrastructure additions such as flashing beacon or other speed reducing measures such as speed zone lights.	

Observation Pt.	Intersection	Community Asset	Engineering	Enforcement	Education	Encouragement	Policy	Field Observations	Recommendation	Image
8 Top Recommendation	30th Ave S dirt cut path/berm							<p>This area at the northeast corner of the school campus has long been a concern to residents as a magnet for crime from nearby International Blvd. (SR99). In an effort to block access, dirt berms were built and the area was planted with blackberry bushes. However, this is also a desired route for children seeking the nearest entry to the school, as the worn path indicates. The berms currently do not block access, but do block visibility, making the crime deterrent less effective. Neighbor participants on the walking audit are strongly opposed to berm removal for fear that without the berm the conditions will get worse.</p>	<p>As it stands, the path neither encourages walking, nor meets Crime Prevention Through Environmental Design standards (CPTED). Instead, we recommend committing to one of two strategies: reclaiming the space for active uses and pedestrian/bike passage, or improve the path design to eliminate all public usage. Please see the CPTED discussion at the end of this report. It is also advisable to conduct another public forum to discuss the complexity of the situation.</p>	
9	30th Ave S in front of the Abby Ridge apartment complex							<p>There is no good walking option here for children. Multiple driveways intersect the walk route and eventually the area opens into a large parking lot. Participants explain that eventually this location will house a new fire station (on the West side of 30th Ave S near S 200th St..)</p>	<p>The fire station is slated to be remodeled in the next few years and would be a prime time to improve this stretch of infrastructure. Communicate with the city department in charge of the planning to ensure that the needs of child pedestrians are considered in the building and parking lot design. Provide safety education for students in the school.</p>	
10	S 200th St and 30th Ave S							<p>The intersection of 30th Ave S and S 200th S is poorly designed with a utility pole directly in the flow of walking. This forces pedestrians out or very near to the fast moving oncoming traffic along 200th.</p>	<p>The fire station is slated to be remodeled in the next few years and would be a prime time to improve this stretch of infrastructure. If the Fire Department owns the gravel lot a short term inexpensive option for this area may be to add gravel to reduce the mud as well as place low barriers to limit the points of auto ingress/egress. Begin inquiring about the design plans for the fire station and make these suggestions early on in the process.</p>	

Appendix I: Crime Prevention Through Environmental Design

Review of the Berm on 30th Ave

The northwestern corner of the school grounds are bordered by an undeveloped right of way connecting 30th to the dead end of 202nd. The northern half of the path is covered with blackberry bushes, and a walking path has been worn down the center of the path.

As evidenced by the worn dirt track, the pathway is currently being used by pedestrians. However, the path does not create a positive environment for walkers or bikers. The blackberry bushes along the north side of the path are overgrown; the dirt path is uneven; the poor drainage floods the path when it rains; there is no activity or eyes-on-the-street close to the path; no houses or businesses are oriented to face the area; and the rise of the berms prevents walkers from scanning the path for dangers before entering. Neighbors also expressed a concern over crime along the path, including drug-dealing and prostitution.

Neighbors indicated that the path was designed intentionally to deter crime. At one time the area was a level gravel path, but the berms were added, the space filled, and blackberry bushes planted in an attempt to make it harder for criminals to flee police. However, several factors contribute to the design's failure to completely eliminate illegal activity. These include unclear ownership (the delineation of public vs. private space), poor maintenance, poor lighting, incomplete path coverage by thorned plants, poor sightlines, and an appearance of neglect/undervaluing.

As it stands, the path neither encourages walking, nor meets Crime Prevention Through Environmental Design standards. Instead, we recommend committing to one of two strategies: reclaiming the space for active uses and pedestrian/bike passage, or improve the path design to eliminate all public usage.

The following steps could contribute to making the space a safe one for walkers and bikers:

- Improve the sightlines of the path.
 - Remove the berm so that criminals can't hide activities using the elevation change.
 - Relocate and/or limb out the school's trees that border the path. Prune trees up to seven feet from the ground.
 - Replace the existing warning sign on 202nd with more attractive in-street bollards.
 - Add a school security camera in the area.
- Maintain the area
 - Remove the litter and graffiti that currently characterize the area.
- Improve the walking surface
 - Widen and flatten the walking surface. Provide additional support to bikers by paving the path.
 - Remove berry bushes and keep other vegetation pruned to less than 3' high.
 - Improve drainage to draw water away from the walking route.

- Increase ownership
 - Work with Blockwatch, neighbors, and/or service groups like the Rotary Club to adopt the path and take responsibility for the area. Use signage to publicize this ownership.
 - Encourage active uses of the space. For example, students could make and maintain murals in the area, neighbors and students could develop a garden space, sculpt the area into an easy bmx course, etc.
- Increase enforcement
 - Work with law enforcement to ensure that drug violations are charged using Drug Free Zone guidelines, which add to sentencing for offenses within 1000' of the zone.
 - Station a school crossing guard, safety staff, or citizen's patrol near the walkway when kids are coming from or leaving school.
- Discourage unwanted usage
 - Install sprinklers to turn on using an intermittent and randomized schedule during the times when the path is not used by students.
 - Add signage to clearly spell out the behavior that is acceptable in the area.
 - Add a police call box in the area.
 - Do not install flat surfaces, such as benches, flat lidded-trash cans, rain shelters, etc.

The following steps could contribute to improving the path's crime prevention effectiveness.

- Improve natural access control
 - Eliminate all passage through the area. Plant new thorned plants along the fence and down the middle of the path rather than waiting for the berry bushes to fill in from the north.
 - Once the path is entirely filled with thorned plants, regularly trim the top, sides, and ends of the area to avoid an appearance of neglect. Overgrown bushes – even thorned ones – provide hollows for storage of contraband or other unwanted activity.
 - Do not rely on fences alone.
 - Consider removing the berm and filling the area with thorned plants trimmed to 3' to prevent passage and retain sightlines.
- Discourage unwanted usage
 - Install sprinklers to turn on using an intermittent and randomized schedule.
 - Add a police call box in the area.
 - Double the length, but halve the height of the road closure sign on 202nd.

- Improve lighting
 - Install lighting on the area to improve the visibility of activities taking place near the path.
- Improve the attractiveness of alternate paths for walkers
 - Increase sidewalks, pedestrian-scale lighting, bike lanes, and other amenities along nearby and more active areas. However, expect that pedestrians of all ages will continue to take the most direct path available.

Either option would benefit from consultation with people who have been trained in CPTED techniques from the landscape architecture or law enforcement fields.

Note: Blackberry bushes are not preferred plants, as they are an invasive species. Recommended (and more attractive) options are provided by the Seattle Police Department at www.seattle.gov/BAN/docs/SNG-CPTED_Plant_List.doc

A PLANT LIST FOR NATURAL ACCESS CONTROL

Compiled by: Hough Beck & Baird Inc, Landscape Architects

Seattle Washington

Natural access control can be achieved by emphasizing natural strategies that integrate behavior management through the design of space and the choice of plant materials. Dense plantings of thorny plant materials can provide a formidable barrier, one that is difficult to penetrate.

The table below provides a list of suggested materials recommended for use in Bellingham, Washington. This specific list contains plants which are considered to be successful tactile buffers due to the presence of spines or thorns. Additional plants may be added to this list as deemed appropriate. Plants should be selected based upon the site-specific conditions which may affect plant growth (such as sun exposure, soil types, shoreline conditions adjacent site improvements, etc.). Plant material selection should be coordinated with maintenance requirements and utility locations to avoid conflicts.

A Plant List for Natural Access Control

BOTANICAL NAME	COMMON NAME	SIZE	GENERAL CHARACTERISTICS
Berberis buxifolia	Magellan Barberry	6' high 6' wide	Evergreen, spines leathery 1" leaves, upright growth, yellow flowers
Berberis buxifolia nana	Berberis nana	1.5' high 2' wide	Evergreen, groundcover, used to control foot traffic, spines dense mounding habit good low hedge
Berberis darwinii	Darwin Barberry	5'-10 high 4'-7 wide	Hardy evergreen, dense yellow-orange flowers in spring, small holly like leaves with spines, arching habit, dark purple fruits.
Berberis Julianae	Wintergreen Barberry	6' high	Evergreen or deciduous can form a very dense compact shrub, spiny Toothed 3" feet leaves one of the thorniest.
Berberis mentorensis	Mentor Barberry	7' high	Semi-evergreen, hardy, thickly textured dark green 1" leaves with spines, turning scarlet red in autumn. Maintained as a hedge.
Berberis thunbergii	Japanese Barberry	4'-6' high	Deciduous 1" leaves. Autumn color, spiny branches, arching habit, many varieties to choose from
Berberis verruclosa	Warty Barberry	3'-4' high	Evergreen Shrub dark green 1" leaves yellow flowers, blue black fruit, spines
Eleagnus pungens	Thorny Eleagnus	6'-15' high	Evergreen Shrub, dark Green, Leathery 1"-3" leaves upright habit with dense growth and spiny branches, silver white flowers in the autumn
Ilex aquifolium	English Holly	40' high	Evergreen tree or shrub, will take a shrub form if pruned in early years, slow growing attractive winter fruit Many varieties to choose from.
Ilex Cornuta	Chinese Holly	10' high	Evergreen shrub or small tree glossy green spiny leaves, not as hardy as Ilex Aquifolium
Juniperus Species	Juniper Species	Ground cover to 10' high	Evergreen with needle like or scale like leaves, will tolerate a wide range of climate and soil conditions many varieties to choose from.
Mahonia Aquilifolium	Oregon Grape	6' high	Evergreen Shrub with erect habit, compound leaves 4"-10' long with 5-9 very spiny toothed 2" leaflets thrives in severe conditions, yellow flowers in spring purple fruit
Mahonia Nervosa	Longleaf Mahonia	2' high	Evergreen shrub 10"-18" leaves with 7-21 spiny toothed 1"-3" leaflets
Mahonia Repens	Creeping Mahonia	3' high	Evergreen shrub with a spreading habit, spiny toothed leaves, shorter and broader leaflets than other Mahonia species
Pyracantha Coccinea	Scarlet Firethorn	8'-10' high	Deciduous shrub fast growing, thorns, dense irregular growth habit, flowers in early summer, showy red berries
Rosa Rugosa	Rugosa Rose	5-6' high	Deciduous or evergreen shrub, prickly stems, hardy in severe climates
Rubus Spectabilis	Salmonberry	8' high	Deciduous shrub with upright branches, thorns, prefers damp soil

Sources: *Sunset Western Garden Book* and *Trees and Shrubs for Pacific Northwest*.

Appendix II: Guidelines for Bicycle Parking at Schools

Guidelines for Bicycle Parking at Schools

Providing good quality bicycle parking for students and staff can encourage biking by decreasing the risk of conflict, theft, and damage.

Bicycle parking must be:

- visible
- accessible
- secure
- easy to use
- convenient
- plentiful

Bicycle parking should be: covered, well lit, and in plain view without being in the way of pedestrians.

Theft is a serious concern for bicyclists. Nearly 1.5 million bikes are stolen in the U.S. each year. Safe and convenient parking is as critical to bicyclists as it is for motorists. Racks should:

- Be placed in areas with high pedestrian activity and “eyes-on-the-street”
- Be more visible to staff and students than passersby
- Allow the frame and one wheel to be locked to the rack when both wheels are left on the bike
- Allow the frame and both wheels to be locked to the rack if the front wheel is removed
- Allow the use of either a cable or U-shaped lock
- Be securely anchored.



In areas with high crime concerns, schools should consider placing racks in rooms or cages that can be locked during the school day.

Location: Racks need to be sited and installed appropriately for them to be well used:

- Racks that are placed less than 2'-3' from a wall or less than 30" from another rack will end up sitting empty.
- Racks need to be clearly visible and accessible, within 50' of the building's main entrance or at several commonly used entrances.

Design Standards: Racks should:

- Support the bicycle frame, not just one wheel
- Resist cutting, rusting, bending and deformation
- Be usable by bikes with no kickstand and bikes with water bottle cages

- Be usable by a wide variety of sizes and types of bicycle
- Be promoted with bike parking directional signs
- Have roofs or be located under awnings - to provide riders with rain protection while locking their bikes *and* to prolong the life of the bikes' metal and rubber components- an important issue for low-income riders.

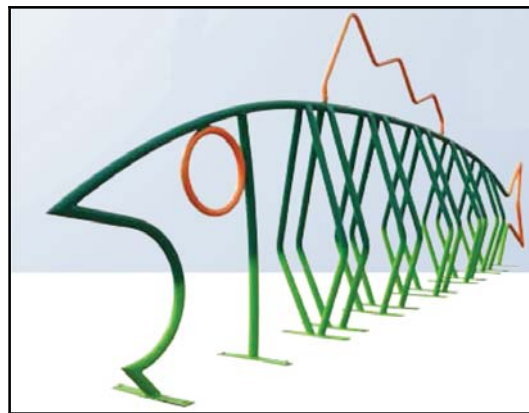


“Wheel-bender” racks (above) can damage wheels and don’t allow frames to be locked to the rack.

Costs: The cost to purchase and install bike rack varies, but is almost always cheaper and more efficient than providing car parking:

- A bike rack that parks two bikes costs \$150 to \$300.
- A locker that holds two bikes costs between \$1,000 and \$4,000 to purchase and install.
- The cost to provide two car parking spaces is \$4,400 on a surface lot and \$25,000 in a garage.
- Parking for 10-12 bikes can fit in the same space required for a single car.

Customized Designs: As long as they meet the guidelines discussed above, bicycle racks can serve a dual purpose by promoting a school’s name, mascot, or values (see below).



More Information: To learn more about how to choose a rack that is good for your school, please consult these resources:

- The Association of Pedestrian and Bicycle Professionals (APBP) <http://www.apbp.org/?page=Publications>.
- The Pedestrian and Bicycle Information Center: <http://www.bicyclinginfo.org/engineering/parking.cfm>.
- Madison, WI bike parking guidelines: <http://www.cityofmadison.com/trafficEngineering/documents/MadisonBikeParking20100715.pdf>
- John Vander Sluis, The Bicycle Alliance of Washington, JohnV@bicyclealliance.org