

**Bridlemile Elementary
Safe Routes to School Problem and Solutions Summary
May 2006**

Introduction

The Portland Office of Transportation (PDOT) initiated a Safe Routes to School (SR2S) engineering review for Bridlemile Elementary with walkabouts on November 9th and December 8th, 2005. At those meetings the concerns of school representatives, parents and students were described and a walking tour around the school and on adjacent streets and school travel routes was conducted. Bridlemile Elementary is located in a low-density neighborhood made up primarily of single-family residences. As with much of southwest Portland, lower density residential land uses are steadily being re-developed into higher density residential uses and not all of the streets have been improved with curb and sidewalk. Common with the west hills of Portland, particularly due to topography, is an incomplete grid of streets. The lack of alternate pathways tends to concentrate traffic on existing through streets more so than in other parts of the city. With the expected increase in homes over the next several years, local traffic concerns are expected to only increase. One feature not found in other parts of Portland is the common existence of right of way for pedestrian trails. The circles in Figure 1 identify two of the local trails near Bridlemile that students use for walking and biking trips.

Figure 1. Area Map

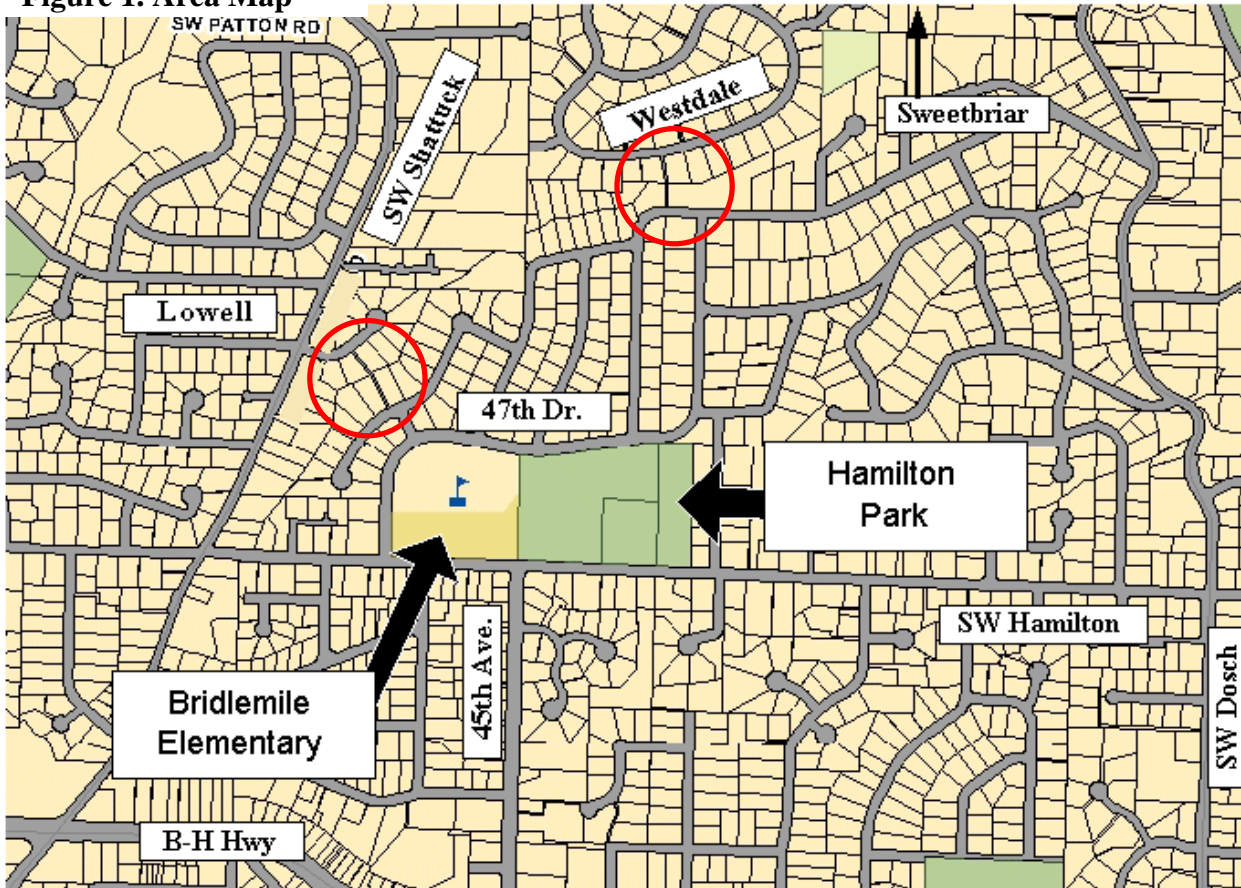


Figure 1 shows the location of Bridlemile Elementary and the adjacent streets. Hamilton to the south, Shattuck to the west, Patton to the north (outside this map) and Dosch to the east represent the major barriers to students walking or riding their bikes to Bridlemile Elementary. Hamilton, Shattuck and Patton are classified as Neighborhood Collector streets. Dosch is classified as a District Collector street. The remaining streets around Bridlemile are Local Service Streets. Local Service streets are

intended to provide pathways between private homes and higher classified streets and preference is often given to pedestrian needs. Neighborhood Collectors are streets where auto and non-auto needs are considered equal. District Collectors are the first level of arterial streets where the needs of auto traffic typically take precedence over the needs of pedestrians.

Twenty-two foot speed bumps (called speed tables) were installed on Hamilton and Shattuck in 1993 as part of the Westside Transportation Management Plan to mitigate diversion from reconstruction work on Sunset Highway. Speed bumps were installed on 47th Drive in 1995 as part of a previous school safety project. It should be noted that the speed tables on Hamilton are placed farther apart than current practice.

Below is a list of concerns that were felt to deter parents from being allowing students to walk, bike or take a transit bus to school. These concerns were provided by school representatives in advance of the walkabout or developed during the walk. The list has been arranged, as determined by PDOT, into two broad categories of safety and convenience with a last category for miscellaneous concerns. Following the first section on problem statements is a solutions summary.

Bridlemile Elementary SR2S Concerns

Safety

- A. Vehicle speed is too fast
 - 1. SW Hamilton.
 - 2. SW Shattuck.
 - 3. SW Dosch.
 - 4. SW Patton.
- B. Unsafe crossings
 - 1. Hamilton at 45th Avenue (vehicle speed and intersection visibility).
 - 2. Shattuck at Lowell (vehicle speed).
- C. Unsafe Tri-Met stops
 - 1. SW Hamilton – narrow or confined waiting area.
- E. Unsafe pedestrian or bike paths (Unsafe Links)
 - 1. SW Hamilton has no sidewalk and a limited (1 to 2 foot) shoulder.
 - 2. SW Shattuck, Dosch and Patton have no sidewalk or shoulder.
 - 3. Several streets north of the school have curb but no sidewalk.
 - 4. Pedestrian trail connecting Tunnelwood and Westdale
 - 5. Tunnelwood between 41st Pl. and 43rd Avenue
- F. Visibility issues
 - 1. The pedestrian trailheads between 48th Place and Lowell Court
 - 2. The pedestrian trailheads connecting Tunnelwood to Westdale
 - 3. SW 47th Drive at Hamilton.
- G. Vehicle Congestion
 - 1. SW Hamilton near 45th Avenue (Hamilton Park frontage), with drivers double parking and blocking the view of children walking on or crossing the road.
 - 2. SW 47th Drive at the drop off/pick up areas and school bus zone.

Convenience

- A. Pedestrian pathways that are often flooded:
 - 1. On school grounds between the school and Hamilton along the play field.
 - 2. SW Hamilton

3. SW Shattuck

B. Lack of or poor pedestrian or bike connectivity (Broken Links)

1. No trail connecting Downsview and Sweetbriar
2. Hamilton at SW 45th Avenue
3. Hamilton at 47th Drive

C. Bike racks or storage locations are deficient.

Miscellaneous

- A. Review School Signing
- B. Too many single-family car trips.
- C. Tri-Met schedule is inadequate.

Summary of Findings and Solutions

SAFETY

Vehicle Speed

Vehicle speed counts were reviewed or collected for the streets of concern and are presented in Table 1, below.

Table 1. Collected Speed Data

Location	Date	Eastbound Speed*	Westbound Speed*	Lowest Posted Speed	Eastbound Volume	Westbound Volume	Total
SW Hamilton at 47 th Dr.	6/6/05	24	28	20	1730	1100	2830
SW Hamilton at 47 th Ave	5/6/05	24	29	20	1650	1090	2740
SW Hamilton at 47 th Dr.	4/11/05	24	28	20	1770	1100	2880
SW Hamilton at 47 th Dr.	3/8/05	24	28	20	1860	1170	3030
Historical Hamilton Data							
SW Hamilton E/47 th Dr.	5/9/96	31	32	20	1460	1260	2720
SW Hamilton W/42 nd Pl.	6/13/96	36	36	30	1130	960	2090
SW Patton W/44 th	5/28/03	35	36	25	2770	2850	5620
Location	Date	Northbound Speed*	Southbound Speed*	Lowest Posted Speed	Northbound Volume	Southbound Volume	Total
SW Dosch S/Martins	2/7/06	34	33	25	2170	2050	4220
SW Shattuck S/Lowell St.	4/18/02	32	33	20	1880	1780	3660
SW Shattuck S/Windsor	12/7/05	36	38	35	1670	1820	3490

* Miles per hour - 85th percentile speed; 15% of drivers exceed this.

From Table 1 it can be seen that vehicle speeds on Hamilton remain high in the 20-mph school zone, though they have decreased since the speed tables were originally installed in 1993. Speeds on Dosch, Shattuck (in the school zone), and Patton also appear to be excessive.

Solutions for Speeding

Hamilton

It is recommended that an alteration of the speed table layout on SW Hamilton be undertaken to further reduce speeding there. The speed tables on either side of SW 47th Drive are approximately 560 feet apart while the tables on either side of 45th Avenue are over 860 feet apart. For a posted speed of 30 mph the recommended spacing is 500 to 600 feet. To achieve average speeds closer to the posted 20-mph school zone speed, the 22-foot speed tables should not be placed farther than 400 feet apart. 22-foot speed tables are necessary on SW Hamilton (instead of the shorter 14-foot bumps) due to the transit designation of the street. Two additional speed tables are recommended between the existing three placed from west of 47th Drive to just west of 41st Avenue. This change is estimated to cost \$4,000 and will require an open house, though it may not require approval of adjacent property owners. This change will also make the crossing of Hamilton safer.

Figure 2. Existing and Proposed Hamilton Speed Tables at Bridlemile Elementary



Further adjustments outside these boundaries is also recommended to bring the speed table layout up to current standards for the posted speed of the street. Hamilton east of 45th is scheduled for resurfacing in 2007 and this would present a good opportunity to revisit the table layout. Any existing speed tables would be reconstructed as part of normal maintenance activities, so the cost of the same number of tables would be borne by the City. Additional speed tables could be funded from the Bridlemile SR2S fund, however an additional public process would be needed to approve a new speed table layout.

Shattuck

As with Hamilton, and for similar reasons, an adjustment of the location of the speed tables and an additional table on Shattuck is recommended. The speed table south of Thomas should be moved closer to Lowell Court and an additional speed table constructed north of Thomas (Figure 3). The cost of this change is estimated at \$5,000 and should also make the crossing on Shattuck at Lowell safer. However, the addition of a speed table on Shattuck may be difficult due to the street's designation as a Major Emergency Response (ER) route in the Transportation System Plan (TSP). With ER route restrictions there are also opportunities. Mitigation for additional devices on Shattuck may be to replace all of the speed tables with a new device, the offset speed table (Figure 4 and 5).

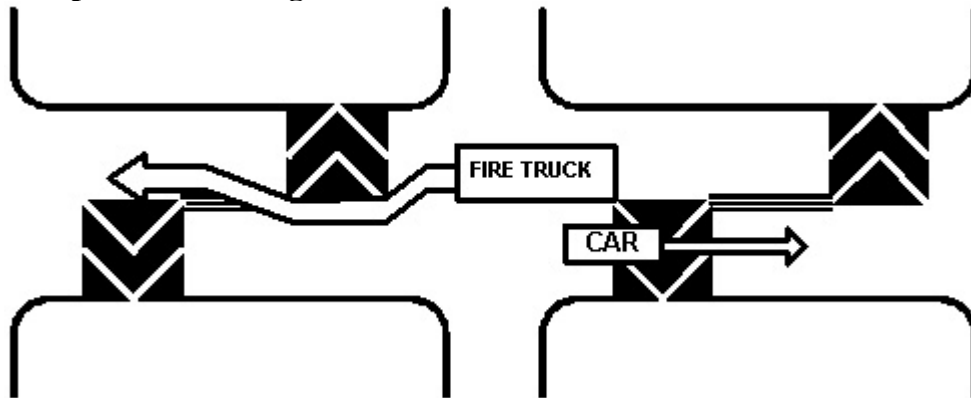
Figure 3. Shattuck Speed Tables Adjust



Figure 4. Shattuck Offset Speed Tables



Figure 5. Offset Speed Table Design



Offset speed tables are split down the centerline of the street and each half is offset about 50 feet apart. This permits a fire truck to avoid all or part of the speed table and reduce delay. The estimated delay for the current three speed tables, not considering street grade, is approximately 32 seconds. Each offset speed table pair is estimated to not delay fire trucks more than 5 seconds. Three sets of offset speed tables would delay fire trucks about 15 seconds (a 50% reduction in delay) and four sets (extending the effective slowing area) would cause about 20 seconds delay, a 30% reduction in delay. Full replacement of the three standard speed tables with three offset speed tables would cost approximately \$12,000 and four sets would cost about \$15,000. Some or all of the funding for offset speed tables may be provided by the Fire Bureau or CSTSP research funding since Shattuck is already an ER route.

SW Dosch Road

SW Dosch Road is the most difficult street to address in regards to speed. Dosch is designated as a District Collector in the TSP and an ER route. District Collector streets are the first level of street where the accommodation of vehicular traffic begins to take precedence over the needs of pedestrians and cyclists. An existing all-way stop was only recently placed at the intersection of Dosch Road and Hamilton Street and this may slow some vehicles near the intersection and should make the intersection safer for pedestrians to cross. Additional engineering to alter vehicle speed on SW Dosch is not recommended at this time as part of the SR2S program, however continued enforcement activity, particularly at times when students would be walking on Dosch is recommended.

SW Patton Road

SW Patton Road is also a difficult road on which to address speeding. Patton is designated as a Neighborhood Collector and ER route in addition to having Transit, Bikeway and Walkway designations. Patton is posted for 25 mph due to the numerous curves in the roadway. Increased periodic enforcement at times when students would be walking on Patton may be the most effective solution.

Solutions for Unsafe Crossings

Hamilton at 45th Avenue

This intersection is inside the school zone on Hamilton that includes flashing beacons. The recommended adjustments to speed tables on Hamilton should reduce vehicle speed and make the road safer to cross. This intersection is also west of a crest vertical curve (hilltop) making the statutory crossing somewhat obscured. Hamilton at 45th is a crossing often used by students south of Hamilton and the southeast corner of the intersection is wide enough that parking for Hamilton Park patrons occurs there. With the two demands for a safe crossing additional warnings for drivers are recommended. Signing and striping a pedestrian crossing costs approximately \$1500.

Shattuck at Lowell

This intersection is inside the school zone on Shattuck that includes flashing beacons and the crosswalk is marked as a school crossing. The recommended adjustments to speed tables on Shattuck should reduce vehicle speed and make the road safer to cross. There are no additional recommendations to improve the crossing safety at this time.

Solutions for Unsafe Tri-Met Bus Stops

It is recommended that a confined gravel or concrete platform be placed at Tri-Met stops that are narrow or do not provide sufficient space off the roadway for a pedestrian to wait. Each four-foot by six-foot concrete pad would cost approximately \$500. A confined gravel pad of similar dimensions would cost approximately \$200. It is recommended that the eastbound Tri-Met stop on Hamilton at 45th be relocated farther east.

Solutions for Unsafe Pedestrian Pathways

SW Hamilton

Hamilton has no sidewalk and a limited (1 to 2 foot) shoulder on its north side adjacent to school property. It is recommended that students walk on the north side of the street along the school and park frontage, but outside this boundary it is unclear what the SR2S project can accomplish. It is recommended that a discussion be initiated with property owners adjacent to Hamilton regarding how their property interacts with the roadway, particularly related to increasing space for pedestrians. Widening the shoulders west of 47th Drive and east of 45th Avenue would provide the greatest benefit to pedestrians.

SW Shattuck

Shattuck is a Neighborhood Collector and ER route. Shattuck has no curb or sidewalk and little if any shoulder with shallow ditches near the edge of pavement. It may be possible to widen the shoulder space by placing a filter fabric in the roadside ditch and filling it with crushed rock. This would permit water to collect below the rock. During most of the year this would permit pedestrians to walk in the former ditch space without getting wet.

SW Dosch

As discussed in regards to speeding, SW Dosch Road is the first level of street where the accommodation of vehicular traffic begins to take precedence over the needs of pedestrians and cyclists. PDOT is investigating pedestrian mitigation for streets like Dosch in SW Portland. An existing all-way stop was only recently placed at the intersection of Dosch Road and Hamilton Street. A marked pedestrian crossing was also added recently on Dosch just south of the intersection with Sunset. These changes were undertaken as part of a review requested by the Southwest Hills Residential League (SWHRL). Additional changes to Dosch for pedestrian safety are larger issues than the SR2S program can address at this time. Enforcement at times when students would be walking on Dosch and at crossing locations may be the most effective solution.

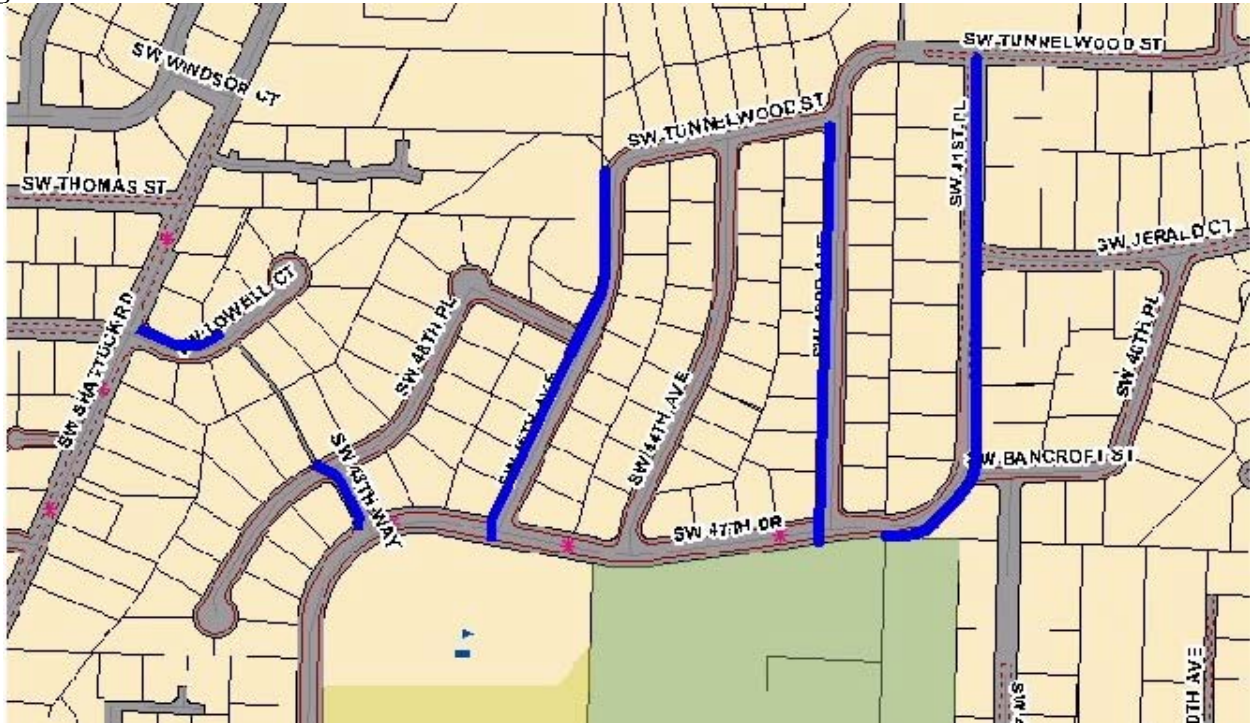
Patton

SW Patton, like Shattuck, generally has no curb or sidewalk and intermittent, often narrow shoulder with shallow ditches very near the edge of pavement. Unlike Shattuck, Patton is posted for 25-mph. This enables enforcement to be more effective on Patton than other streets. Enforcement at times when students would be walking on Patton and at crossing locations may be the most effective solution.

Streets North of the School

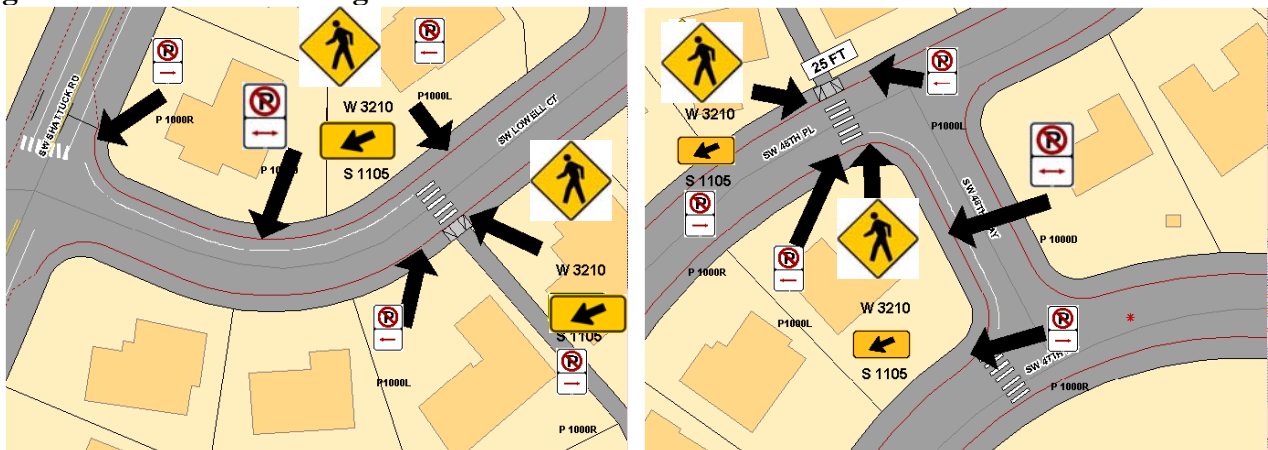
For the streets immediately north of the school the safest and most difficult improvement would be the addition of sidewalks. Separation of pedestrians from vehicular traffic, especially young pedestrians, provides the maximum safety. The difficulty with sidewalk construction in this area is twofold. Though adequate right of way exists behind the curbs on both sides of the street, residents have traditionally occupied that public right of way with landscaping. Removal of the existing, sometimes elaborate, landscaping would prove politically difficult. A greater obstacle is the cost. Six feet of curb tight sidewalk costs approximately \$35.00 per lineal foot to build. Just to place sidewalk on one side of each street with curbs north of the school would cost approximately \$175,000 (5,000 feet). Less safe, but easier to do would be to remove parking from one side of each street and mark a pedestrian path in the street. Five thousand feet of marked pathways would cost approximately \$14,000. Selective placement of marked pathways could either reduce the total cost or extend the application area (see Figure 6, below). The parking removal for these locations could be limited to school hours or school days, however parking loss should be weighed against the addition of new walking space.

Figure 6. Potential Marked Pedestrian Paths



Marked and signed crosswalks are also recommended where painted paths are installed and pedestrians are encouraged to cross a street. Figure 7, below, depicts two such locations on Lowell Court and on 48th Place.

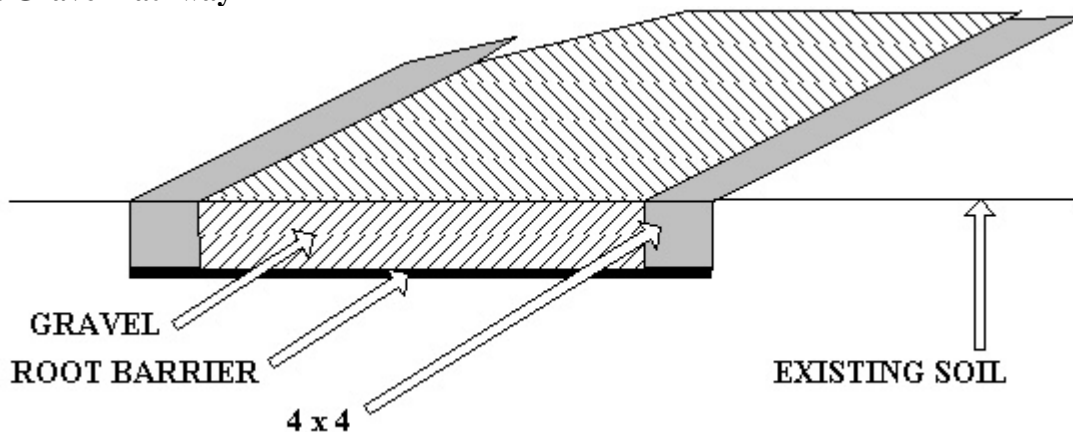
Figure 7. Trailhead Crossings



Update (May 2006): PDOT has determined that a pedestrian lane on a street is not appropriate, but parking removal to provide a clearer path for pedestrians to use is appropriate.

Hamilton Park is located east of Bridlemile Elementary School. The 47th Drive frontage of the park property only has curb, but no sidewalk and is close to 700 feet in length. A sidewalk along this frontage would cost approximately \$25,000. An alternative path of gravel may cost \$7000. Figure 8, below, depicts what such a pathway might look like.

Figure 8. Gravel Pathway



Pedestrian trail connecting Tunnelwood and Westdale

The trail between Tunnelwood and Westdale is fairly steep. Improvements to make the trail safer to use include rebuilding the footbridge and terracing the trail or constructing stairs using wood. A rough estimate to reconstruct this trail is \$10,000.

Tunnelwood between 41st Pl. and 43rd Avenue

This section of Tunnelwood is unimproved and essentially raw land. A narrow, crooked and very uneven asphalt path exists on a portion of the trail but ends in a narrow catch basin before the grade drops two or three feet over bare ground. Crushed rock would be the most expedient method to improve this trail by eliminating the uneven pathway. Crushed rock costs about \$15 per ton and a ton would amount to approximately 10 cubic feet of material. To place one foot of gravel, six feet wide, over the 75-feet of trail would cost approximately \$800 for materials (17 cubic yards).

Solutions for Visibility Issues

Pedestrian Trailheads: 48th Place to Lowell Court and Tunnelwood to Westdale Trails

It is recommended that pedestrian trail heads be reconstructed to include a pedestrian curb ramp. This would provide a four-foot ramp to the street and six feet of wing on each side of the ramp where vegetation could no longer obscure the path entrance. Each curb ramp would cost approximately \$500. In conjunction with trailhead improvements, no parking zones should be installed for visibility clearance, particularly if the trailhead is on a developed street. Two no parking signs cost \$150 installed.

SW 47th Drive at Hamilton

PDOT can request the adjacent property owner clear vegetation on Hamilton west of 47th Drive. This should improve visibility in that direction of travel.

Solutions for Vehicle Congestion

SW Hamilton, east of 45th

The north side of Hamilton east of 45th Avenue is frontage of Hamilton Park and includes a pipe post barricade (no fence fabric) about six feet from the edge of pavement. Beyond the fence the topography of the park drops off rapidly. This park hosts soccer practices and other activities creating a high demand for parking. Parents regularly park along this frontage even though it is posted as a no parking zone. Parents also park at the southeast corner of Hamilton and 45th and cross to the park west of the vertical curve. The steepness of the grade beyond the fence makes relocating the fence and adding parking along Hamilton beyond the scope of this project. A field check of the current parking signs

found them to be widely spaced and an older design. It is recommended that the signing along this frontage be upgraded so that current standard signs are placed at approximately 100-foot intervals. Enforcement should be included with the sign upgrade.

It may be possible to expand available on-street parking on SW 47th Drive along the park frontage there. SW 47th drive along Hamilton Park is 36-feet wide. Currently drivers park parallel to the curb. For the approximate 530 feet of available curb parking there would be 27 parallel parking spaces. Another 15 parallel spaces exist on the north side of 47th Drive. 47th Drive is wide enough (36 feet) to accommodate 45-degree angle parking on the south side and leave at least 20 feet of street for other uses (Figure 9, below). The parking proposed would be back in parking (Reverse Angle Parking – RAP) due to the street width and would accommodate 40 spaces. During school days the north side parking could be prohibited so that two vehicles could pass each other comfortably, or it may be possible to leave the north side parking in place since the volume of traffic on 47th Drive is low. During non-school hours parking would be possible on both sides of the street. With reverse angle parking drivers leaving those spaces should use 43rd and loop back down 44th, or a small traffic circle could permit U-turns. Striping angle parking would cost about \$1500, including signs. A small traffic circle may cost \$10,000.

Figure 9. Reverse Angle Parking on SW 47th Drive

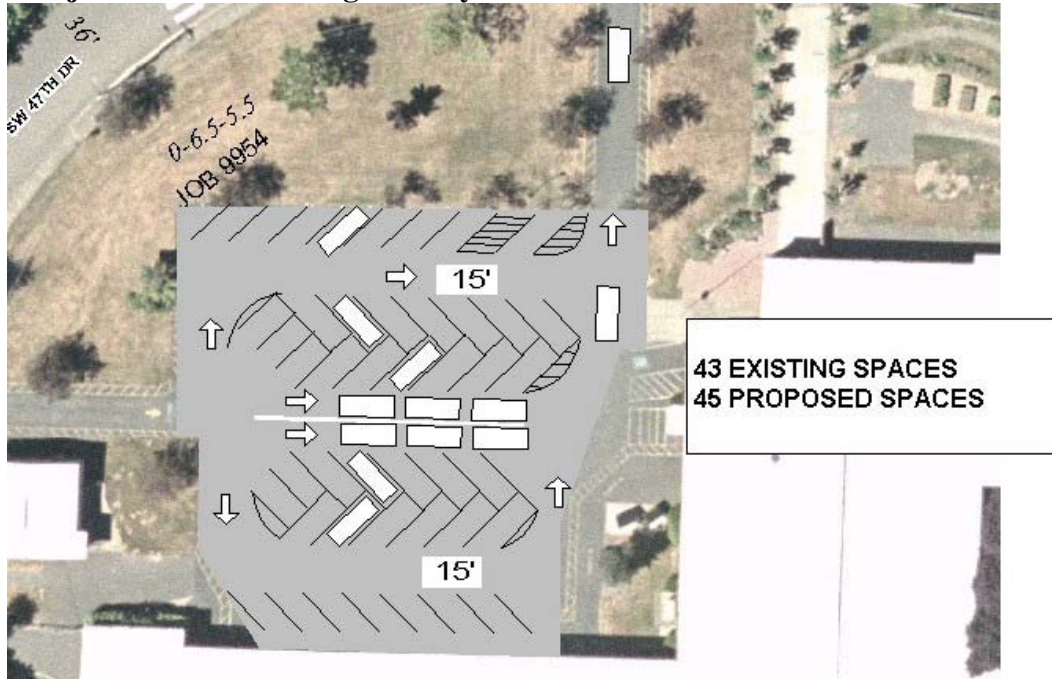


SW 47th Drive

The congestion on SW 47th Drive is due to the coincidence of bus parking and student drop-off and pick-up activities on SW 47th Drive and in the school parking lot. Congestion can be alleviated by one of two common methods. The first is reduction of traffic and the second is better management of existing traffic. Apart from a longer-term educational effort and engineering solutions that reduce auto trips to the school, there are no clear methods to reduce auto traffic. Better management appears to be the best solution. The addition of parking along the park frontage may reduce demand near the school, particularly if added pedestrian amenities in the park along 47th Drive are provided. Near the school the many drivers at drop-off and pick-up time often park in locations they would not otherwise. Parking restrictions near the corners of adjacent side streets would make crossing there safer for pedestrians. It would also help with intersection operation. Enforcement would likely be needed to keep these locations clear.

The existing on-site parking was reviewed for efficiency. Two potential alterations are presented that would provide more off-street parking. Figure 10, below, depicts a slight adjustment to the current layout that could add two spaces. The adjustments would also permit two-lanes in the center where parents could queue waiting for their children. Adjusting the striping as shown may cost \$1500.

Figure 10. Adjust Current Parking Lot Layout



When managing large crowds that tend to leave a venue at the same time very close spacing is possible as shown in the two-lane driveway in Figure 10. This concept can be taken farther as shown in Figure 11, below.

Figure 11. Festival Queuing



If all of the angle spaces are not continuously needed throughout the day, a grid pattern can be set up that permits more of the parking lot to be used for closely spaced vehicles. Since most parents would be arriving over a 30-minute period, but leaving over a 10-minute period the chances that one vehicle would be blocked in and unable to leave would be rare. Parents that needed to be at school longer could use the angle parking or other on-street facilities. The layout in Figure 11 also shows that 4-foot

painted pathways could be included between the parking stalls. The estimated cost of this change is \$4,000.

CONVENIENCE

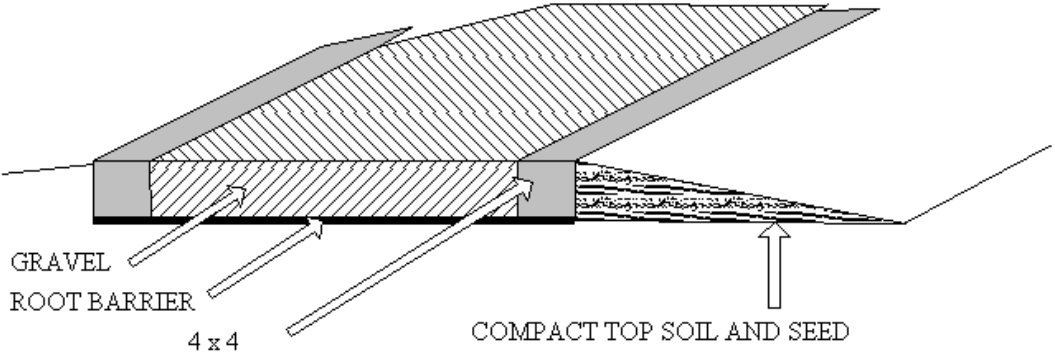
Solutions for Flooded Pathways

The pathway on school grounds between the school building and Hamilton, adjacent to the play field is recommended for enhancement with a confined gravel pathway that is raised three to four inches above the current play field surface (Figure 12). A six-foot wide gravel path would cost approximately \$10 per foot. For the approximate 230 feet of deficient pathway a gravel path would cost approximately \$2300. A depiction of the proposed construction technique is provided in Figure 13, (next page).

Figure 12. Onsite Path



Figure 13. Raised Gravel Pathway



Solutions for Poor Pathway Connectivity (Broken Links)

Downsview and Sweetbriar

There is currently no trail connecting Downsview to Sweetbriar (Figure 14). Land use planning to identify pedestrian needs is one long-term solution to achieve public right of way between the two streets. More expedient would be a public-private partnership to acquire an easement from adjacent property owners. From the photo, it appears a utility easement already exists. This may be a good location on which to piggyback a trail.

Figure 14. Downsview at Sweetbriar



Hamilton at SW 45th Avenue

Several students cross Hamilton at SW 45th. The southeast corner of the intersection provides the most space for pedestrians to wait, but the preferred destination is northwest of the intersection where an existing staircase connects Hamilton to school grounds (Figure 15, next page).

Figure 15. Hamilton Staircase as Seen from SE Corner, 45th and Hamilton



Existing ditches along Hamilton make the path to the stairs difficult as shown in Figure 16, below.

Figure 16. Ditch Between Staircase and SW 45th Avenue, North Side of Hamilton



The extension of the existing culvert at the staircase using 6-inch perforated PVC pipe and filling the ditch with crushed rock would provide two or three feet of added shoulder width on the north side of Hamilton as a pathway to the staircase. A similar treatment at the southeast corner of 45th and Hamilton would significantly improve the pedestrian waiting area (Figure 17, below). This would also make the corner ideal for relocating the eastbound Tri-Met stop currently at the southwest corner.

Figure 17. Existing Ditch, SE Corner of 45th and Hamilton



Hamilton at 47th Drive

The northeast corner does not have a curb ramp. A curb ramp costs approximately \$500.

Solutions for Deficient Bike Storage

The current bike racks are located on SW 47th Drive outside the school fence. This location is not readily visible from the school. The bike racks are old and damaged and are not covered to protect bikes from rain. It is recommended that the existing bike racks be removed and new bike storage facilities be constructed on school grounds in a location that provides a clear view from regularly occupied classrooms or offices and/or foot traffic (as might occur near the main entrance of the school). It is also recommended that the bike storage area provide protection from inclement weather, particularly rain.

MISCELLANEOUS

Review School Signing

School signs can be reviewed for correct placement and visibility.

Solutions for Single Family Car Trips

PDOT may be able to provide assistance through an education and outreach effort to encourage more carpooling to school.

Solutions for Inadequate Tri-Met Service

Determination of frequency of service by Tri-Met is a function of usage and funding. For more frequent service to be provided either more riders would be needed or additional funding for service provided. PDOT is not able to provide assistance for this request.