

Chapter 5 Safety and Maintenance

Safety and the related issue of maintenance are primary community concerns to ensure the roadway system's safety and longevity. This chapter provides an overview of the safety and maintenance issues for the City of Bainbridge Island. The core of the safety section is a discussion about collision history and high collision locations. The maintenance section describes maintenance issues, activities, and programs that occur on the Island.



Many of the Island's two-lane roads were constructed before current safety guidelines were developed. As traffic levels increase, the potential for safety concerns rises. There is a combination of factors that can lead to collisions on roadways, including demographic changes to the Island's population, preferences for larger or more powerful vehicles, increased motor vehicle volumes, and greater use of roadways by pedestrians and bicyclists. Collisions on these roads can have more serious consequences because of narrower lanes and shoulders, hazardous roadsides, steeper grades, and sharper curves, which also impedes the ability for emergency vehicles to respond.

Speed and inattention are factors in the risks and severity of traffic collisions. Both the likelihood of collisions and the severity of injuries are greater with higher speeds. Communities are embracing initiatives for lowering speed limits such as the Vision Zero initiative that has been adopted by the City of Seattle and WSDOT's Target Zero initiative. Vision Zero initiatives make the goal of zero deaths and serious injuries the highest priority and emphasize government taking the lead to implement improvements to further that goal. An emphasis is placed on lowering speed limits through engineering solutions such as narrowing traffic lanes and employing traffic calming.

The City of Bainbridge embraces the principle of putting people first when it comes to safety over efficiency for vehicular traffic and bicycle traffic. The City's standard roadway lane width is 10 feet, providing narrow lanes for traffic calming. The following areas are emphasized for safe street design:

- Consider neighborhood context and existing and future non-motorized use when establishing speed limits.
- In developing capital projects, consider elements that manage speed, improve safety and traffic calming. Examples include non-motorized improvements, roundabouts, traffic islands, and curb bulb outs, and radar feedback signs.
- Include bicycle climbing lanes at locations where differential speeds are greater between cyclists and motorists.
- Provide pathways separated from the roadway for pedestrians, wheel chair users, and cyclists.
- Provide and maintain street lighting in areas used by pedestrians and cyclists in designated centers of the Island and near schools. Locations for lighting include intersections and mid-block crosswalks.



- Maintain or provide vegetation close to the roadway for traffic calming.

The number of collisions provides an indication of the safety of an intersection. Types of safety concerns that may contribute to accident data include:

- *Road Surface Conditions* – Poor roadway surface conditions such as pavement edge drop-offs, potholes, worn lane striping, and reductions in surface friction due to age and wear affect vehicle stopping and maneuvering capabilities. Road conditions may present hazards to cyclists and pedestrians.
- *Intersection Configuration* – Collisions related to high turning volumes, lack of channelization, and improper phasing.
- *Non-Motorized Conditions* – High accident data between vehicles with pedestrians or bicycles may emphasize the need for the construction of non-motorized facilities.
- *Geometric Conditions* – Collisions related to undesirable physical characteristics of the roadway's design, such as sight distance, curve radii, paved width and shoulder, and roadway slope.
- *Enforcement Issues* – Collisions related to vehicle speeding, intersection traffic violations, driving under the influence of alcohol or illegal drugs.

Collision History

Collisions can indicate where safety issues exist within a transportation system. The number of accidents at a specific location is a function of a number of factors including the quality of reporting data, traffic volumes, roadway design and geometrics, vehicle speed, and speed limit. For the analysis, the total number of annual accidents at intersections over a ten-year period is used. Unsignalized intersections with an average annual number of collisions of 5 or more are considered to be a high collision location. Signalized intersections with seven (7) or more accidents are considered to be a high collision location. Appendix G provides the collision history data for the transportation system.

City Intersections

Table 5-1 indicates intersection locations with 10 or more collisions over the ten-year period ending in 2014 per the City's accident data base at locations other than along the SR 305 Corridor. Current data are compared with data from the previous study which was reported over a 9.5-year period ending in 2000.





Table 5-1. Bainbridge Island Collision Locations

Intersection		Type	Accidents 2005- 2014	Average Annual Collisions	Accidents 1991 - 2000	Average Annual Collisions Accidents
High School Rd	@ Madison Ave.	RA	22	2.2	45	4.7
High School Rd	@Hildebrand Ln.	SC1	20	2.0	19	1.9
Winslow Way	@ Ericksen Ave.	SC2	14	1.4	18	1.8
Wyatt Way	@ Madison Ave.	SC4	13	1.3	23	2.4
Miller Rd.	@ Koura Rd.	SC2	12	1.2	---	---
High School Rd.	@ Grow Ave.	SC2	10	1.0	24	2.5
Eagle Harbor Dr.	@ Bucklin Hill Rd.	SC1	10	1.0	---	---

RA - Round About, SC – Stop Controlled

All of the top ten intersections fall below the high collision criteria threshold. The highest number of collisions are reported for the two intersections along High School Road west of and in closest proximity to SR 305.

State Route 305 Intersections

Table 5-2 indicates the collision rates at primary intersections along the SR 305 Corridor from data available from Washington State for the ten-year period ending in 2014.



Table 5-2. SR 305 Collision Locations*

Intersection	Signalized/ Unsignalized	Accidents 2005 - 2014	Average Annual Accidents	Accidents 1997 - 2000	Average Annual Accidents
SR 305 @ Madison Ave.	S	82	8.2	22	6.8
SR 305 @ Sportsman's Club	S	71	7.1	21	6.5
SR 305 @ Day Rd.	S	52	5.2	34	10.5
SR 305 @ High School Rd.	S	47	4.7	25	7.7
SR 305 @ Winslow Way	S	31	3.1	9	2.8

*Under 23 U.S. Code § 409, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential collision sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data

As indicated by the table, the intersections at SR 305/Madison and SR 305/Sportsman's Club exceed 7 collisions per year which is considered higher than what is normally expected for signalized intersections. There are no scheduled improvements identified by WSDOT for these intersections.

Collisions involving pedestrian and cyclists

The State accident report indicates there were 19 injury accidents involving pedestrians (6) and cyclists (13) along the SR 305 Corridor for the ten-year period. The highest concentration of accidents was near the ferry terminal. The vast majority of these collisions outside of the Winslow area involved cyclists. Non-motorized improvements on SR 305/ Olympic Drive near the ferry terminal are in progress.

Apart from SR 305, there were 121 injury accidents reported involving pedestrians (27) and cyclists (94) for the ten-year period. There was at least one fatality involving a pedestrian struck crossing New Brooklyn in December of 2010. The highest concentration of accidents occurred on Madison Avenue (17), Winslow Way (16), High School Road (14), and Wyatt Way (10). In 2012, Winslow Way was reconstructed including pedestrian and bike facility improvements. Non-motorized improvements are planned for Wyatt Way and Madison Avenue.



Addressing Safety Problems

Addressing safety problems requires a combination of approaches ranging from educating the driver, better enforcement, to improving the roadway. Roadway improvements fall into two major categories — improvements designed to prevent collisions from occurring, and improvements that minimize the severity of collisions that occur. Types of improvements include:

- *Clear Zones*—Areas of open space with gentle slopes adjacent to the road giving motorists room to safely regain control of their vehicles if they run off the road. These areas should include features such as signs and utility poles which break away on impact, barrier walls or guardrails that redirect vehicles away from hazards, and collision cushions that absorb energy and lessen the severity of collisions.
- *Guardrails* – The Island along its perimeter has many medium and high bluffs. In the interior, the island’s topography is hilly in many areas. Guardrails are employed at many locations. Many of these guardrails are older and do not meet current design standards and some are in disrepair. There are some locations where new guardrails may be warranted due to roadway configuration, topography, travel speed, and traffic volumes.
- *Signing, Pavement Marking, and Delineation* — Traffic signs, pavement markings, rumble strips, and reflective devices improve driver perception of important roadway features and alert them to changes in roadway geometry or other conditions.
- *Pavement Improvements and Preventive Maintenance* — Greater smoothness and friction of the road surface are provided by pothole repair, resurfacing, rehabilitation, and reconstruction.
- *Intersection Controls* – Stop signs, roundabouts, and traffic signals can better control traffic flow and reduce intersection conflict points.
- *Adding or Widening Shoulders* – Shoulders provide drivers, pedestrians, and cyclists additional room to maneuver on narrow roads or to pull out of travel lanes.
- *Channelization* – Separate lanes for left or right-turning traffic avoid impediments to traffic flow and can reduce rear end collisions.
- *Pedestrian/Cyclist Facilities*—A variety of techniques can be used to separate pedestrians and cyclists from motor vehicle traffic to improve safety.



How study addresses safety

The IWTP proposes improvements that will improve the safety of the roadway system through targeted improvements at intersections and roadways. Safety-related elements of this study include:

- Reviewing roadway geometrics and promoting safety enhancements,



- Identifying and mitigating high collision locations,
- Identifying and mitigating intersections with poor LOS operations, and
- Including safety as a factor in the evaluation of the roadway system.

Safety Programs

Current Safety Programs provided by Public Works include:

- **Roadside Safety Program** – This program provides for the inventorying and inspection of roadside elements of the Island’s secondary arterial streets and higher volume collector streets. The program also provides for contracting work that is beyond the capacity of Operations and Maintenance. Roadside elements include items such as guardrails, shoulders, and clear zones. This program provides for the prioritization of guardrail repairs, replacements, and installations.
- **Focused Traffic Studies Program** – This program provides for the study of traffic control measures implemented on the Island’s roadways. As conditions change with factors such as population growth and development, it is necessary to evaluate the effectiveness of roadway signage and other traffic control devices. Many residents are concerned about vehicular speeds, and this program provides for the evaluation of speed limits.

Maintenance

An important function of the City of Bainbridge Island is preservation and maintenance of the existing roadway system. Careful maintenance allows existing travel corridors to maintain their function, prevents damage from water and vehicle loads, and maximizes the use of City resources. Periodically the City evaluates the condition of the roadway system and computes a Pavement Condition Index (PCI). The latest condition assessment is included in Appendix H.

Maintenance Issues

The City of Bainbridge Island’s Public Works Department oversees roadway maintenance activities for the Island.

Key maintenance issues for the City include:

- **Vegetation growth** – Overgrown vegetation requires the trimming of foliage to retain roadway safety and sight distances.
- **Pavement maintenance** – As roadways age, the pavement surface and underlayment can be damaged by traffic, heavy vehicles, weather, and water seepage if not properly maintained. Poor pavement condition can affect the safety of the road for drivers and bicyclists.
- **Gravel road grading** – The surface of gravel roadways can deteriorate quickly, producing potholes in the roads. These roads need regular re-grading to maintain the surface.
- **Dirt and gravel on shoulders and roadways** – Regular sweeping of roadways is necessary to provide a clean, smooth surface for travel. Bicyclists are particularly concerned about gravel, dirt and debris accumulating on shoulder areas.



- *Stormwater* – Maintaining good roadway stormwater drainage is important to protect the roadway and to prevent flooding hazard.
- *Roadway erosion* – Roadway erosion on shoreline and steep slope areas is an issue for the City. Repair of these roadways often is expensive and may require special permits and consistency with shoreline management goals and objectives.

Maintenance Programs

The City's roadway system has a number of on-going programs to keep the current roadway system functioning, and to prevent major failures that would require extensive roadway reconstruction.

- *Street sweeping program* – Street sweepers collect debris and litter before they enter the stormwater collection systems or roadside ditches. This function is important to protect stormwater run-off from the roadways and to provide a safe surface for automobiles and bicyclists.
- *Brush cutting program* – Island-wide mowing of vegetation to maintain roadway clearance and sight lines.
- *Roadway ditches and shoulders* – These components of the roadway system are periodically maintained, cleaned, and reshaped to ensure they function as designed.
- *Roads preservation program* – The City of Bainbridge Island has an annual road program focused on preserving, maintaining, and repairing the existing roadway infrastructure. Each street is evaluated for 1) reconstruction, 2) overlay, 3) seal coat and/or 4) patching. Where the roadway does not require complete reconstruction, the City can repair damaged sections (patch with asphalt), apply chip seal layer (an oil emulsion and crushed rock layer), or overlay new asphalt over the existing pavement.
- *Gravel grading program* – The City fills and regrades the surface of a limited number of gravel roads annually.
- *Trail and pathway maintenance program* – The City cuts brush and restores trail surfaces to maintain its separated pathway and trail network.
- *Special maintenance* – The City also performs maintenance activities not addressed in the above programs such as the removal of large trees that may present hazards to the traveling public.
- *Sign inventory* – The City maintains a data base of signage and routinely maintains or replaces signs to meet reflectivity and other requirements.