

Collision History

20 What is the recent SR 169 collision history?

Collision data for SR 169 is summarized in the following pages by roadway segment and collision type. The data comes from the Washington State Highway Annual Collision Data Summary (found on the WSDOT website:

<http://www.wsdot.wa.gov/mapsdata/tdo/accidentannual.htm>).¹⁷

The analysis period was from 2002 through 2004 and the total number of collisions for each year during the analysis period was nearly the same.

Enumclaw Segment Collision Analysis

Collisions in the Enumclaw segment make up only 2.4% of all collisions along the entire SR 169 highway during the study period. The breakdown of collision types on the Enumclaw segment are displayed in Exhibit 3.34 on the next page. While fixed object collisions are the most frequent collisions in this segment (46.7%), they only make up 12.4% of all collision on SR 169 during the study period.

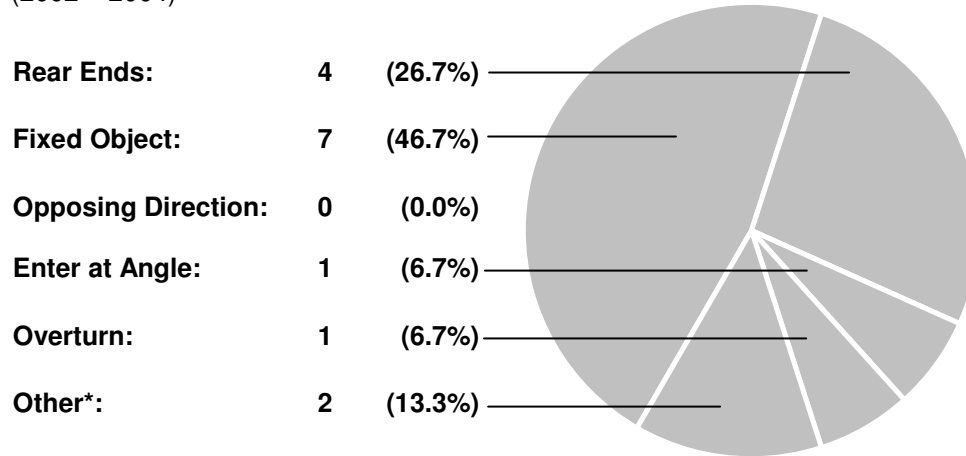
Possible causes of a fixed object collision are the presence of narrow shoulders, too many fixed objects in the highway right-of-way (or “clear zone”); or a combination of both causes. The combination of narrow shoulders, not enough left-turn lanes, and pm peak hour congestion also contribute to rear end collisions in this area.

¹⁷ Federal law 23 United States Code Section 409 governs use of the data contained in above mentioned Summary. Under this law data maintained for purposes of evaluating potential highway safety enhancements: “. . . Shall not be 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.” If anyone attempts to use this data in an action for damages against WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data, these entities expressly reserve the right, under Section 409, to object to the use of the data, including any opinions drawn from the data.

Exhibit 3.34

Types of Collisions on SR 169 Enumclaw Segment¹⁸

(2002 – 2004)



Source: WSDOT 2002 – 2004 Collision Data

* includes: pedestrian, and bicycle collisions

Total Collisions: 15 - include 0 fatalities, 1 disabling injury collision, and 2 alcohol-related collisions

Rural / Agricultural Segment Collision Analysis

There are a wide variety of collision types in the Rural / Agricultural segment. The top five collision types range from enter at angle collisions (25%) to rear end collisions (16%).

There is not a single leading type of collision in this segment. The breakdown of collision types on the Rural / Agricultural segment are displayed in Exhibit 3.35 on the next page.

The total collisions in this segment make up about 10% of the total collisions along the highway. The enter at angle collisions and opposing direction collisions represent a higher percentage of collisions in this segment than they do in the SR 169 highway as a whole.

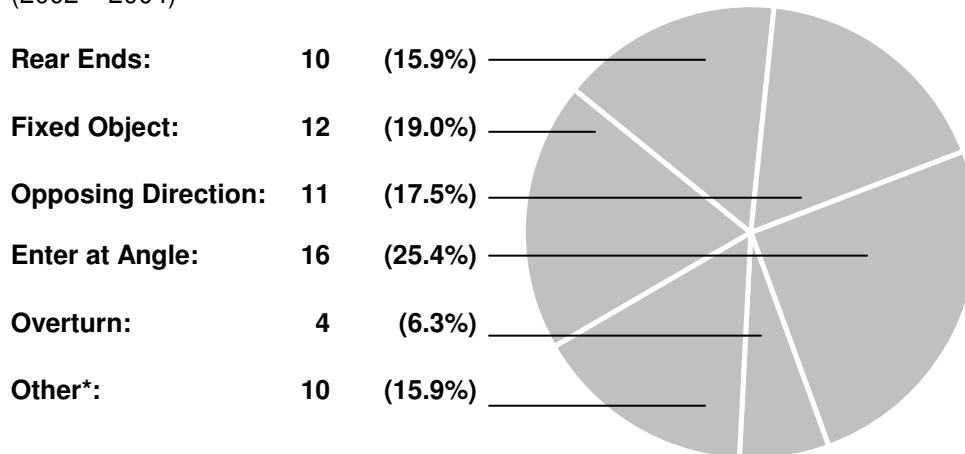
¹⁸ Federal law 23 United States Code Section 409 governs use of the data contained in the Exhibit above. Under this law data maintained for purposes of evaluating potential highway safety enhancements: ". . . Shall not be subject to discovery or admitted into evidence in a federal or state court proceeding 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." If anyone attempts to use this data in an action for damages against WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data, these entities expressly reserve the right, under Section 409, to object to the use of the data, including any opinions drawn from the data.

	Rural / Agricultural	SR 169 Total Collisions
Enter at Angle	25.4%	12.1%
Opposing Direction	17.5%	8.9%

There were 10 disabling injury collisions from 2002 to 2004 along the Rural / Agricultural segment. This was the most disabling injury collisions of any SR 169 segment. The ten disabling collisions were almost 16% of all Rural / Agricultural segment collisions and 38.5% of the SR 169 study area disabling injury collisions.

The SE 400th Street intersection experienced a high number of enter at angle collisions likely due to inappropriate risk taking or driver inattention along the minor leg of the two-way stop controlled intersection. After the data was gathered for this report a new traffic signal was installed at this location. Initial reports indicate this should greatly reduce the number and severity of collisions at this location.

Exhibit 3.35
Types of Collisions on SR 169 Rural / Agricultural Segment¹⁹
 (2002 – 2004)



Source: WSDOT 2002 – 2004 Collision Data
 * includes: pedestrian, and bicycle collisions
 Total Collisions: 63 - include 0 fatalities, 10 disabling injury collisions,
 and 7 alcohol-related collisions

¹⁹ Ibid.

Black Diamond Segment Collision Analysis

Most of the Black Diamond segment collisions were either enter at angle or rear end collisions. A high number of rear end collisions usually coincides with the presence of congested conditions. The breakdown of collision types on the Black Diamond segment are displayed in Exhibit 3.36 on the next page.

The total collisions in this segment make up about 8% of the total collisions along the highway. The enter at angle collisions represent a higher percentage of collisions in this segment than they do in the SR 169 highway as a whole.

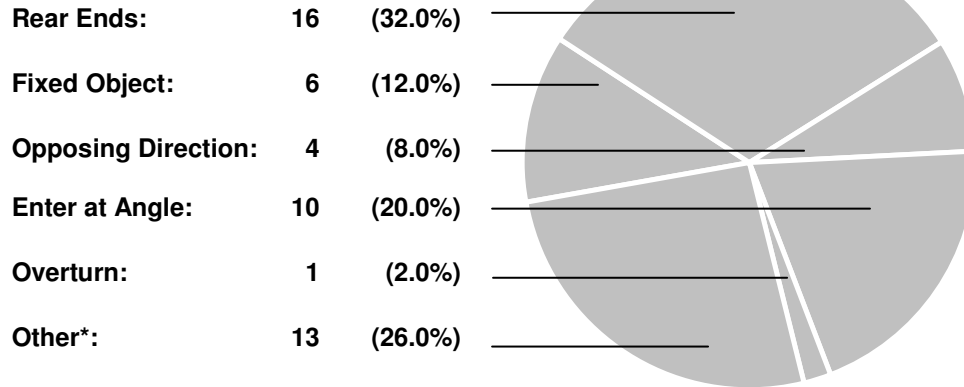
	Black Diamond	SR 169 Total Collisions
Enter at Angle	20.0%	12.1%

A high number of enter at angle collisions suggests that turning onto and off of the highway is a safety issue that may be improved through installation of turn pockets or by controlling access to the highway. Controlling access can be done by installing a center median and directing potential “left-turn traffic” to make a right turn and then proceed to the next “u-turn available” intersection. Another access control tool is combining driveways to adjacent properties.

Exhibit 3.36

Types of Collisions on SR 169 Black Diamond Segment²⁰

(2002 – 2004)



Source: WSDOT 2002 – 2004 Collision Data

* includes: pedestrian, and bicycle collisions

Total Collisions: 50 - include 0 fatalities, 2 disabling injury collisions, and 2 alcohol-related collisions

Starting with the Black Diamond segment and heading northbound on SR 169 the traffic volumes begin to increase considerably. With increased traffic volumes comes increases in the kinds of collisions that are consistent with the presence of congestion, specifically rear end collisions. The Black Diamond, Maple Valley, Cedar River and Renton segments all experience rear end collisions as the leading type of collision.

Maple Valley Segment Collision Analysis

The Maple Valley segment is the segment with the largest number of collisions along SR 169 (36% of all highway collisions). The breakdown of collision types on the Maple Valley segment are displayed in Exhibit 3.37 on the next page. As stated above, most of the collisions are rear-enders. Some contributing factors to the high number of rear end collisions are:

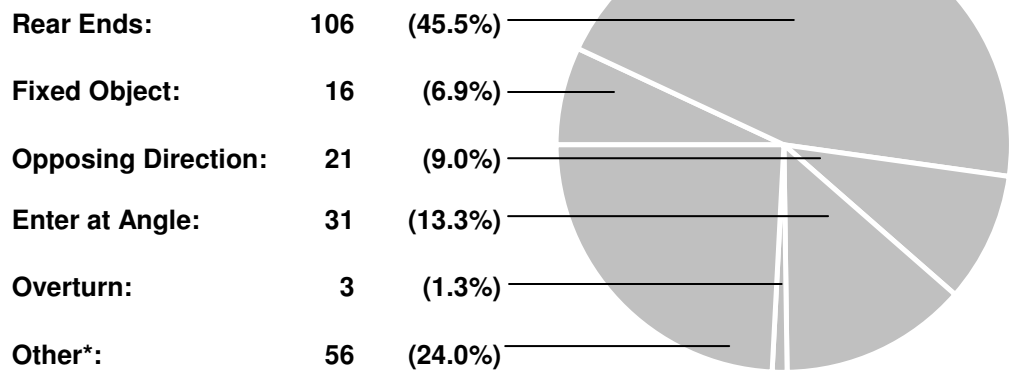
- there are several traffic signals in this area (causing free flow speeds to suddenly stop);
- varying speed limits ranging from 35 mph to 50 mph throughout the segment;

²⁰ Ibid.

- a large increase in traffic volume when compared to the southern end of the SR 169 corridor, and
- several uncontrolled commercial driveways that do not have left turn (or refuge) lanes to accommodate left turning vehicles entering the roadway during congested periods.

SR 169 had a total of 5 pedestrian collisions during the 2002 to 2004 time period. The Maple Valley segment was the site for 3 of those 5 pedestrian collisions.

Exhibit 3.37
Types of Collisions on SR 169 Maple Valley Segment²¹
 (2002 – 2004)



Source: WSDOT 2002 – 2004 Collision Data
 * includes: pedestrian, and bicycle collisions
 Total Collisions: 233 - include 1 fatality, 5 disabling injury collisions, and 11 alcohol-related collisions

Cedar River Segment Collision Analysis

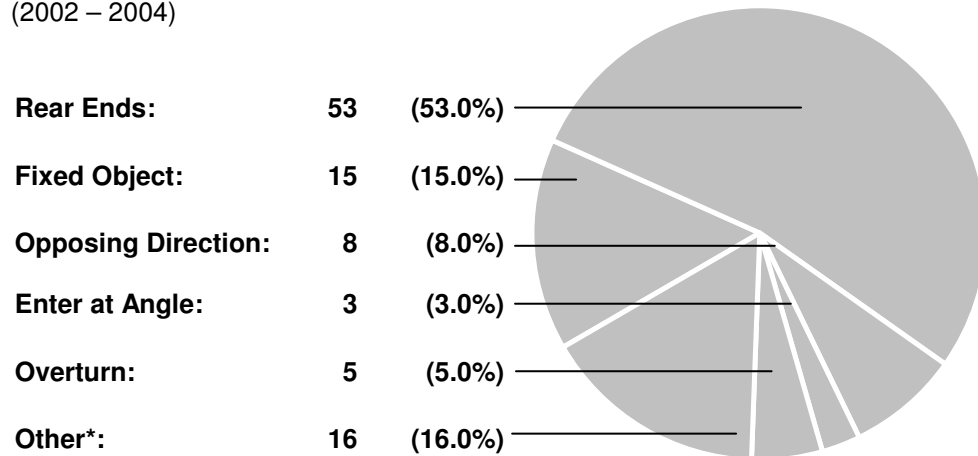
The majority of the collisions in the Cedar River segment was rear end collisions. One contributor to this type of collision is the presence of several uncontrolled commercial driveways. Collisions occur because left turning vehicles leaving and entering the roadway during congested periods do not have left turn (refuge) lanes to accommodate their maneuver.

²¹ Ibid.

The total collisions in this segment make up about 16% of the total collisions along the highway. The breakdown of collision types on the Cedar River segment are displayed in Exhibit 3.38 on the next page. The Cedar River segment has the second highest number (14) of alcohol related collisions among the six segments. Still, this percentage (14%) is similar to the total percentage for the whole highway (16%).

Exhibit 3.38

Types of Collisions on SR 169 Cedar River Segment²²
(2002 – 2004)



Source: WSDOT 2002 – 2004 Collision Data

* includes: pedestrian, and bicycle collisions

Total Collisions: 100 - include 1 fatality, 5 disabling injury collisions, and 14 alcohol-related collisions

Renton Segment Collision Analysis

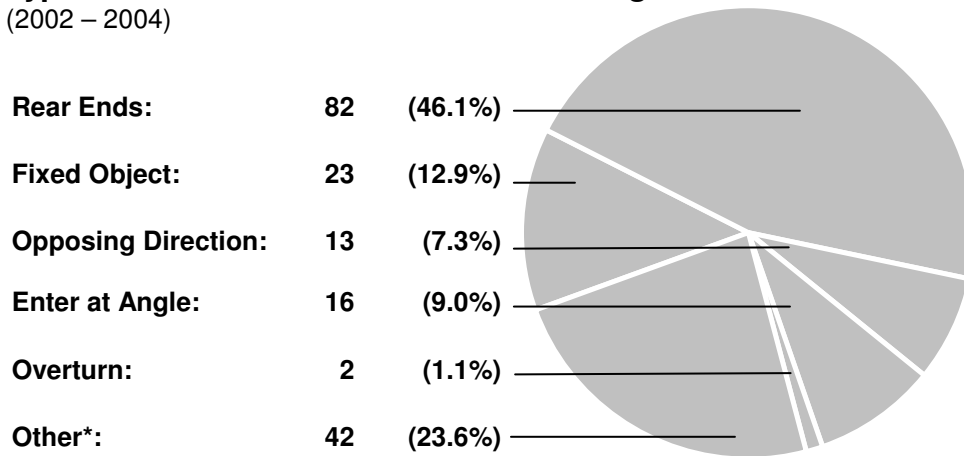
The majority of collisions in the Renton segment were rear enders, which are usually indicative of congested conditions. One contributor to this type of collision is the presence of several uncontrolled commercial driveways. Collisions occur because left turning vehicles leaving and entering the roadway during congested periods do not have left turn (refuge) lanes to accommodate their maneuver.

The breakdown of collision types on the Renton segment are displayed in Exhibit 3.39 on the next page. The total collisions in this segment make up about 28% of the total collisions along the highway. The Renton segment has by far the highest

²² Ibid.

number (69) of alcohol related collisions among the six segments. Thirty-nine percent of the segment’s collisions were alcohol related. This more than doubles the percentage (16%) of alcohol related collisions for the whole SR 169 highway.

Exhibit 3.39
Types of Collisions on SR 169 Renton Segment²³
 (2002 – 2004)



Source: WSDOT 2002 – 2004 Collision Data
 * includes: pedestrian, and bicycle collisions
 Total Collisions: 178 - include 2 fatalities, 3 disabling injury collisions,
 and 25 alcohol-related collisions

Exhibit 3.40, below, displays the SR 169 collision type by segment in one table. It should be noted that an actual cross comparison of collisions per segment would not be valid because of the varying distances, terrain, number of lanes, number and type of access points, and traffic volumes between each segment.

²³ Ibid.

Exhibit 3.40**SR 169 Collision Type by Segment**

(2002 – 2004)

Segment	Fixed Object	Rear End	Opposite Direction	Enter at Angle	Overturn	Other	Total Collisions
Enumclaw	7	4	0	1	1	2	15
Rural / Agricultural	12	10	11	16	4	10	63
Black Diamond	6	16	4	10	1	13	50
Maple Valley	16	106	21	31	3	56	233
Cedar River	15	53	8	3	5	16	100
Renton	23	82	13	16	2	42	178
TOTALS	79	271	57	77	16	139	639

Source: WSDOT 2002 – 2004 Collision Data²⁴

Note: "Other" includes pedestrian and bicycle collisions

Total Collisions: 639 total collisions includes 4 fatalities, 26 disabling injury collisions, and 69 alcohol-related collisions

Higher than Average Collision Locations**21 Where are the higher than average collision locations on SR 169?**

There are five SR 169 roadway sections that had a higher than average number of collisions from 2002-2004 when compared to other similar type highways²⁵ as shown in Exhibit 3.41 below and Exhibit 3.42 on the next page.

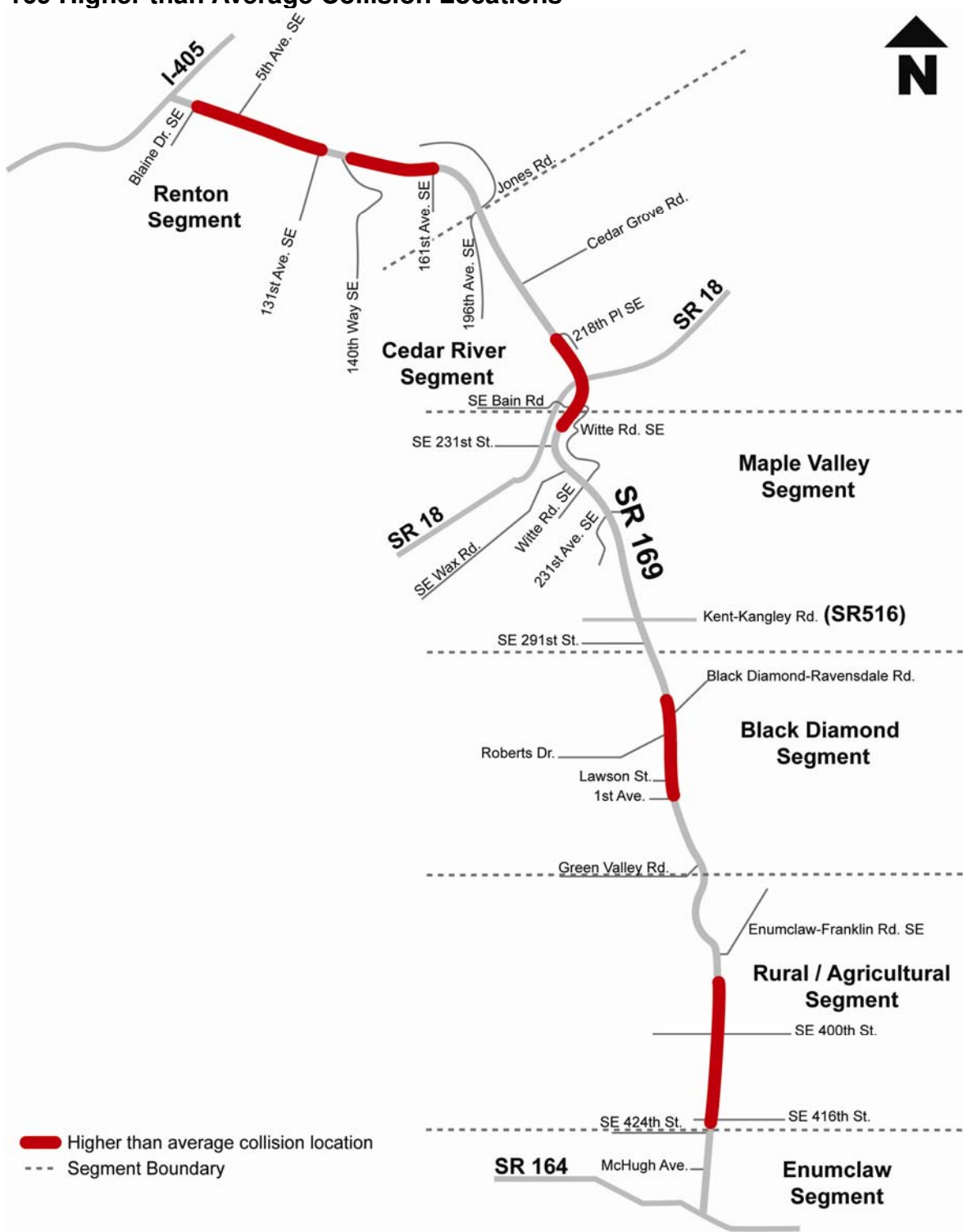
Exhibit 3.41**SR 169 Higher than Average Collision Location Information²⁶**

Milepost	Approximate Location	Jurisdiction	Recent Corrective Action
1.50 to 3.49	South of SE 416th Street to South of Enumclaw-Franklin Road SE (including the SR 169 / SE 400th Street intersection)	King County	Channelization and traffic signal installation at SE 400th Street
7.50 to 8.49	Vicinity of 1st Avenue to North of Black Diamond-Ravensdale Road	Black Diamond	None
14.50 to 16.49	South of Witte Road SE / SE Bain Road to North 218th Place SE	King County	Illumination
21.50 to 22.99	161st Avenue SE to 140th Way SE	King County / Renton	Channelization and traffic signal installation at 152nd Avenue SE
23.50 to 24.99	South of 131st Avenue SE to North of Blaine Drive SE	Renton	None

Information Source for Exhibit: 2004 WSDOT Collision Analysis.

²⁴ Ibid.²⁵ Ibid.²⁶ Ibid.

Exhibit 3.42
SR 169 Higher than Average Collision Locations²⁷



²⁷ Ibid.

22 Where are the recent pedestrian or bicycle collision locations on SR 169?

From 2002 to 2004 there were 5 pedestrian collision locations on SR 169; three of these pedestrian collisions were in the Maple Valley segment. However, between 1999 and 2002, a total of 13 collisions along the corridor involved a pedestrian or bicyclist. Of the 13 collisions, seven involved pedestrians and the other six involved bicyclists. Three of the bicycle collisions occurred in the Renton Segment of SR 169 between the intersections of 152nd Avenue SE (milepost 22.08) and 149th Avenue SE (milepost 22.32). The other bicycle collisions occurred near:

- McHugh Avenue (milepost 0.67) in Enumclaw
- SE 271st Street (milepost 11.23) just south of the Four Corners in Maple Valley
- SE 216th Way (milepost 15.07) north of Maple Valley
- SE Green Valley Road (milepost 6.02)
- Black Diamond-Ravensdale Road (milepost 8.64)
- 231st Avenue SE (milepost 13.14)
- SE Wax Road (milepost 14.04) in Maple Valley
- SE 216th Way (milepost 15.07) north of Maple Valley
- Milepost 16.77 between Cedar Grove Road and SR 18
- 196th Avenue SE (milepost 18.43) in unincorporated King County²⁸

23 Where are the safety and mobility issue locations on SR 169?

Based on the data described in this chapter, the following areas discussed in Exhibit 3.43 on the next page are known or are predicted to have mobility problems and safety issues on SR 169.

²⁸ Ibid.

Exhibit 3.43

SR 169 Mobility and Safety Problems by Segment²⁹

Segment	Problem Statement
Enumclaw	<p>Safety: Narrow shoulders create the potential for conflicts between moving vehicles and cars parked on the shoulder. Narrow shoulders also create unsafe conditions for school children and other pedestrians walking along the corridor.</p> <p>Congestion: Truck traffic and other slow moving vehicles on this segment can create frequent peak period congestion. Additional delay results when vehicles stop to make left turns at points on the highway without left turn lanes.</p>
Rural / Agricultural	<p>Safety: A portion of this segment south of SE 416th Street up to south of Enumclaw-Franklin Rd. SE is an area that had a higher than average number of collisions from 2002 to 2004 when compared to other similar type highways.</p> <p>Congestion: Truck traffic and other slow moving vehicles on this segment, limited passing lane opportunities, and steep grades create frequent congestion and hazardous passing situations.</p>
Black Diamond	<p>Safety: A portion of this segment in the vicinity of 1st Avenue to north of Black Diamond-Ravensdale Road is in an area that had a higher than average number of collisions from 2002 to 2004 when compared to other similar type highways. There are awkward angled intersections in this segment of the highway.</p> <p>Congestion: There is frequent truck traffic on this segment. During peak hour travel the existing roadway segment is at or near capacity.</p>
Maple Valley	<p>Safety: A portion of this segment south Witte Road SE / SE Bain Road to north of 218th Place SE – into the Cedar River segment – is in an area that had a higher than average number of collisions from 2002 to 2004 when compared to other similar type highways. In addition there is frequent truck traffic on this segment. The many trucks that turn onto and off of SR 169 at SR 516 are unable to make the turn within the available lanes, frequently driving over the curb or into opposing traffic lanes, creating hazardous situations. In addition, there are a high number of driveway collisions reported near the SR 169 / Kent Kangley Road intersection.</p> <p>Congestion: The combination of high peak period traffic, high truck volumes, and trucks slowly maneuvering through the SR 169 / SR 516 intersection create congestion and limit the number of vehicles able to pass through the intersection during one traffic signal cycle.</p>
Cedar River	<p>Safety: Continuing from the Maple Valley segment, a portion of this segment from south of Witte Road SE / SE Bain Road to north of 218th Place SE is in an area that had a higher than average number of collisions from 2002 to 2004 when compared to other similar type highways</p> <p>Congestion: There is frequent truck traffic on this segment. During peak hours the existing roadway is at or near capacity. There are traffic backups and vehicle delay when vehicles stop in the through lane to make left turns.</p>
Renton	<p>Safety: Much of this segment is in an area that had a higher than average number of collisions from 2002 to 2004 when compared to other similar type highways.</p> <p>Congestion: There is frequent truck traffic on this segment. During peak hour travel existing roadway segment is at or near capacity. The I-405/SR 169 intersection and other intersections are bottlenecks for peak hour traffic volumes.</p>

²⁹ Ibid.