

Appendix

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Appendix A SR 532 Communications / Stakeholder Engagement

COMMUNICATIONS/ STAKEHOLDER ENGAGEMENT DOCUMENTS

SR 532 Island County Camano Island / City of Stanwood / Snohomish County

MP 0.00 to 10.09

November 2022

Stakeholder Engagement Summary and Exhibit a - d

- a. Communications and Stakeholder Engagement Strategy
- b. Public Survey Questionnaire
- c. SR 532 _Online-Survey-Select Graphics
- d. SR 532 _Online-Survey-Results-Data-Summary

Stakeholder Engagement Summary

Commitment to public engagement

The mission of the Washington State Department of Transportation is to provide and support safe, reliable, and cost-effective transportation options that support livable communities and economic vitality for people and business. To successfully achieve this mission, we must interact and coordinate with community advocacy groups, chambers of commerce, downtown associations, tribes; local, state, and federal government agencies, other stakeholders and the general public.

In some instances, community engagement is also required by federal and state law and is the policy of the department. When done well, community engagement helps to ensure projects are identified and developed within appropriate contexts, avoids costly delays, provides an opportunity for educating the public and builds community support and trust.

We recognize that public involvement efforts should be flexible, culturally sensitive and tailored to specific communities as appropriate.

Engagement strategy

This corridor study was initiated in February of 2022 while the State of Washington was still operating under COVID-19 restrictions and protocols. During the COVID-19 pandemic the goals and strategies of the State of Washington were to observe federal, state and local health and safety protocols, while at the same time providing a way to obtain stakeholder input.

We sought to identify existing cohorts of individuals who may have a high volume of corridor users because of their geographic location to SR 532. We also worked to identify traditionally underrepresented populations within the corridor and provided them with the opportunity to participate in the survey. Lastly, we followed WSDOT protocols for engaging with the local tribes whose members travel through the corridor along SR 532.

Targeted stakeholder engagement

According to the 2020 Census the study area population was about 31,080 people. Approximately 17,356 people live on Camano Island, 7,705 people live in the City of Stanwood and an estimated population of 6,300 people in rural Snohomish County near the SR 532 corridor.

Our strategy for engaging stakeholders included providing a link on our project web page and through media sources, notifying people on WSDOT's list serve and reaching out to our partners for local and regional support. Additional outreach included:

- Local elected officials for Island County, Snohomish County and City of Stanwood
- Island Regional Transportation Planning Organization
- Puget Sound Regional Council
- Skagit Regional Clinics – Stanwood
- Catholic Community Services
- Community Services Advisory Council Snohomish County
- Chambers of Commerce
- Emergency Management Services

According to the US Census data for 2020, Hispanics make up 3.46% of the population on Camano Island and 1.8% of the population in Stanwood. The rural areas of Snohomish County have the largest population of Hispanics with an estimated 11.6%. None of the households on Camano Island or in Stanwood reported a non-English language at home as their primary shared language.

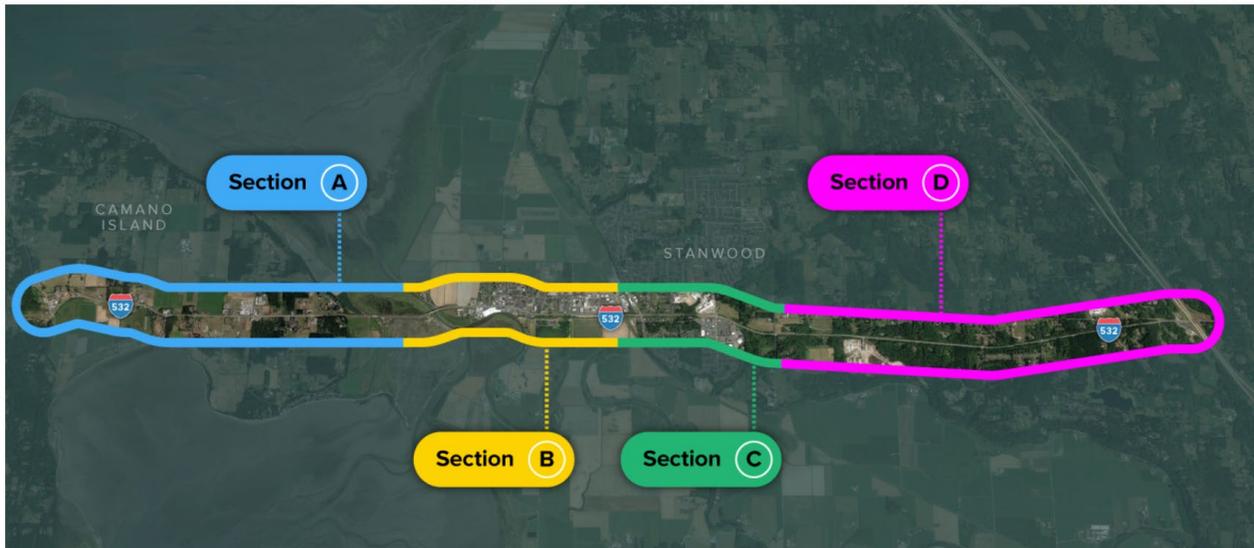
Seven of the local area Tribes were also contacted and sent letters from the Assistant Area Administrator with an invitation to share feedback and observations about the corridor.

Online Public Survey

SR 532 is a primary east-west corridor to Interstate 5 for the city of Stanwood, Camano Island and unincorporated areas of Snohomish County. Over the last several years the community and elected officials have voiced concerns over the increase in traffic and safety issues on SR 532. To gain a better understanding of their concerns on SR 532 WSDOT undertook a public online survey. The survey asked respondents to evaluate four sections on the corridor between Terry's Corner in Island County to Interstate 5 interchange. Each section has a distinct land use and transportation characteristic. Map Sections are noted in Figure 1.0. Sections included:

- A. Camano Island (Terry’s Corner to the bridge/waterway) – This area is rural in nature with scattered commercial and housing developments along SR 532.
- B. Stanwood west (Bridge/waterway to Pioneer Highway) – This area is considered urban and is within the historic commercial area of City of Stanwood.
- C. Stanwood east (Pioneer Highway to 64th Ave NW) – This area is considered urban and is in the City of Stanwood in Snohomish County. Residential, schools and the newer commercial areas are located on this segment.
- D. East Stanwood (64th Ave NW to the I-5 interchange) – This area is considered rural and is in Snohomish County with scattered residential housing, industrial and commercial services at the I-5 interchange.

Figure 1.0 Online Survey Geographic Sections



Responses to this survey will be used in conjunction with transportation operations and safety data collected and analyzed for the corridor.

Survey Details

The survey produced some interesting results. While we did not get a significant number of surveys back from some locations in the Study Area, we found that many of the survey responses had comparable answers among participants in the study area. This was especially true for Camano Island and Stanwood respondents.

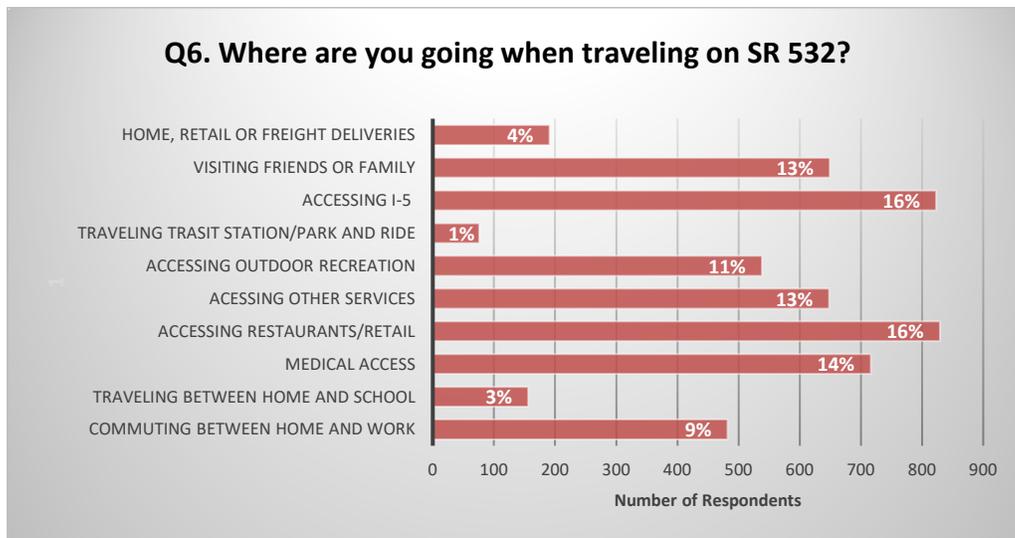
- Survey opened: September 16, 2022
- Survey Closed October 6, 2022
- Total respondents: 951 (Study Area population 31,080 or 3.1%)
 - *Camano Island* – 666 / 3.8%
 - *City of Stanwood* – 165 / 2.1%
 - *North Stanwood* – *29
 - *East Stanwood* – *59
 - *South Stanwood* – *32

Survey highlights

The survey data confirmed much of the same information that was revealed through data analysis.

A. General Questions

- 88% to 90% of people access the highway by personal vehicle across all locations. However, up to 4% of people in Stanwood walk as compared to less than 1% in other locations.
- 5% of respondents indicated that they used transit, with 79% of all respondents indicating that they have not used transit. However, in Stanwood 8% of respondents indicated they used transit daily and 16% indicated occasional use.
- 71% of respondents traveled the corridor everyday with 30% traveling on the corridor multiple times per day. About 26% traveled on the corridor weekly.
 - The percentage increased to 80% for people living in Stanwood with 47% driving every day and 33% multiple times a day.
 - East of Stanwood 86% traveled on the corridor every day and 64% of these traveled multiple times a day.
- 52% of respondents indicated that they could plan for a trip to take a similar amount of time on SR 532.
- 73% respondents indicated that they agree or strongly agree that the SR 532 corridor was more congested than before COVID-19.
- 33% of respondents indicated that personal needs have changed the way they travel on SR 532.
- Most trips were for restaurants/retail, accessing I-5 and going to medical services.

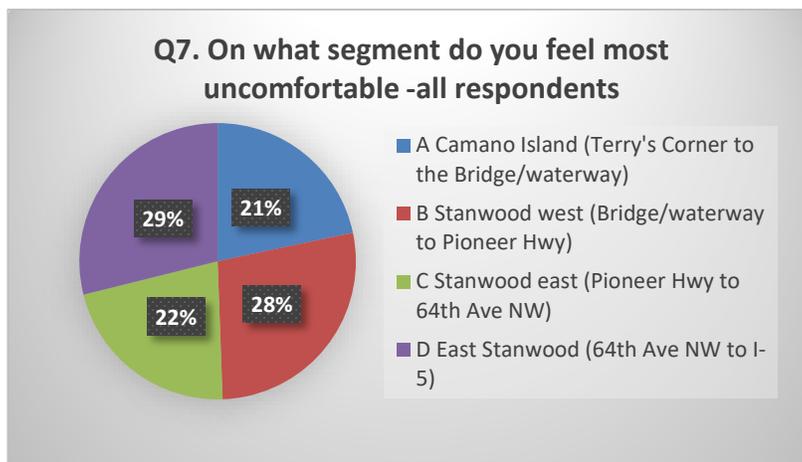


- When asked what segments respondents regularly travel on most respondents living on Camano Island used Section A 28% of the time and all other parts of the corridor about equally between 22% and 26%. Respondents from Stanwood used Section A only 14% of the time.



B. Congestion and safety

- When asked what section “do you feel most uncomfortable on” – all respondents reported concerns on all segments of SR 532. However, the highest level was reported for Segment B (Stanwood west to the County line at Davis Slough) at 28% and Segment D (East of Stanwood to the I-5 interchange) at 29%. Section D was also highlighted in the open-ended question as the most uncomfortable section while Section B was reported as the most congested. Responses closely correlated with the Section that respondents regularly traveled on the corridor.



Seg.	Congestion and delay on SR 532	Safety and speeding on SR 532
A.	82% of Camano respondents agree or strongly agree that they experience congestion and delay. 68% of Stanwood and respondents east of Stanwood experience congestion and delay.	52% of Camano respondents and 53% of Stanwood respondents agreed or strongly agreed with this statement, however 40% were either neutral, disagreed or strongly disagreed.
B.	92% of Camano respondents agree or strongly agree that they experience congestion and delay, while 88% of Stanwood respondents feel the same.	52% of Camano respondents agree or strongly agree with the statement, however, 47 disagreed with this statement.
C.	84% of Camano and 80% of Stanwood respondents agree or strongly agree that they experience congestion and delay.	57% of Camano respondents agree or strongly agree with the statement. However, 74% of Stanwood respondents agree or strongly agree with the statement.

D.	64% of Camano respondents agree or strongly agree with the statement. However, 73% of Stanwood respondents agree or strongly agree with the statement.	76% of Camano respondents agree or strongly agree with the statement. However, 87% of Stanwood respondents agree or strongly agree with the statement.
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C. There were several areas of concern highlighted by the public through open text:

- Section D was highlighted most often as an area of concern due to aggressive driving, speeding, and failing to merge to the right west bound lane. Several local road intersections were also identified as problematic for merging onto the highway. 64th Ave NW received the most comments of all local road intersections on the corridor for merging and safety concerns closely followed by Sunday Lake Rd and 36th Ave NW intersections The Lenz gravel pit was noted for its large trucks and turning movement issues on and off SR 532.
- Section B was identified most often with congested and slow speeds and with some turning movement concerns from local intersections turning on SR 532.
- Section A was identified for speeding and problems with left turn movements from local road intersections onto SR 532. Good Road and Smith Road were identified as having the most issues in the segment but were low in comparison to 64th Ave NW and 36th Ave NW. Other local intersections identified on Camano Island included Land Hill Road and Juniper Beach.
- Section C was identified most often with pedestrian safety issues near the high school/Hagans. Congestion was also identified near the 72nd Street and Pioneer Hwy intersection signals.

D. Other comments:

- Better timing of traffic signals along the corridor
- Limiting road expansion because it only brings more growth.
- Add more lanes.
- Improving transit operations and schedule.
- Better bike accommodations.
- Better maintenance and preservation.

Follow up engagement.

Following the baseline technical analysis, we will follow up with our partners and stakeholders on any proposed planned actions to address study findings. Follow up information will be provided on our website at <https://wsdot.wa.gov/construction-planning/search-studies/sr-532-baseline-study>.

The Stakeholder Survey Questionnaire, Select Graphics and Data are in Exhibits 1-3.

SR 532 Baseline Corridor Analysis

Communication and Engagement Plan



Terry's Corner, Island County to Interstate 5 in Snohomish County
Mile Post 0.0 to 10.08

Background:

The 10-mile-long east-west corridor of State Route 532 runs between Camano Island and the Interstate 5 junction in Snohomish County, providing the only roadway connection to Camano Island in Island County. Given that SR 532 serves as a multimodal corridor, WSDOT, in partnership with several stakeholders including the City of Stanwood, Island County, Snohomish County, Island Transit, Community Transit, and Island Regional Transportation Organization (IRTPO) is currently conducting an existing conditions analysis of the State Route 532 Corridor between Terry's Corner (MP 0.0) and Interstate 5 (MP 10.08).

What do our partners say about transportation along the corridor?

City of Stanwood: Recently drafted 2024 community vision statement: Promote historic downtown Stanwood as the commercial and cultural heart of the Greater Stanwood/Camano region while strategically planning for future growth and economic development opportunities of the entire City.

- Stanwood's long-range vision includes *Sense of Community and Mobility*: It is known that residents of Stanwood want to retain the City's strong sense of community by fostering a family friendly culture that protects the area's natural beauty, celebrates its rural roots, promotes local businesses, encourages community events, and provides

spaces for people to work and play. Stanwood should provide for all forms of multi-modal transportation, including trails, sidewalks, bike lanes, transit and private vehicles.

Island County: Island County has developed broad goals, along with specific policies, to provide the framework for the Transportation Element of its Comprehensive Plan adopted in 2016. This plan was established through the feedback solicited at the public meetings conducted in 2014 and input from the Project Advisory Committee, the Board of Island County Commissioners and the Island County Planning Commission. The statements were developed to be consistent with the statewide goals articulated in the Washington Transportation Plan (WTP) 2035 and Island County’s Countywide Planning Policies.

The Goals are:

1. Provide a safe, comfortable and reliable transportation system that provides adequate mobility for people, goods and services;
2. Preserve prior investments in the transportation system;
3. Support land use development and economic vitality by providing context-appropriate transportation infrastructure;
4. Minimize negative environmental impacts;
5. Build strong relationships between all local and regional agencies to engage in cooperative planning of common transportation improvements;
6. Promote physical activity by expanding options for active transportation mode.ⁱ

Snohomish County: Vision 2040 is a regional land use plan and growth strategy for Snohomish County which encourages population growth and economic development to take place within a regional hierarchy of cities, defined by their size and the roles they play in the region and unincorporated areas, both urban and rural. As such, Vision 2040 outlines the region will have a safe, clean, integrated sustainable and highly efficient multimodal transportation system that supports the regional growth strategy and promotes economic and environmental vitality and better public health.ⁱⁱ

Island Transit: Two of Island Transit’s goals are *Economic Vitality* – promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy.

- Island Transit contributes to economic vitality by providing fare free public transportation to places of employment, school, medical appointments, and other activities. Island Transit strives to support the local tourism industry by connecting Island County to its four gateways and beyond.
- Mobility – improve the predictable movement of goods and people throughout Washington State. Island Transit operates under the requirements of its Performance Standards Policy, and continually analyzes service to keep the system efficient and effective.ⁱⁱⁱ

Community Transit: Journey 2050, Community Transit’s Long-Range Plan (LRP) update, will build on the agency’s established corridor-based vision for bus service, with an expanded plan to meet transportation needs between today and 2050. Community Transit is currently in Phase 2 of their long-range plan which includes service development and

scenarios and a public outreach component in Q3. During this time, transportation in Snohomish County will undergo immense transition with new light rail connections to the region. The public transit and broader transportation landscape in Snohomish County is fundamentally changing and Community Transit wants to lead that change. It may be noted that not all of Journey 2050 applies to the SR 532 Baseline Analysis study area.^{iv}

Island Regional Transportation Planning Organization: Island Access 2040 has a decidedly regional perspective on mobility and the transportation system and is somewhat indifferent to jurisdiction boundaries or system ownership. The focus instead is on seamless travel between jurisdictions, and between the Island Region and the rest of the state. Interregional connections between the Island Region and adjacent regions are particularly important factors, as are the interregional partnerships needed to support those connections into and out of the region. Island Access maintains a multimodal perspective, meaning that regional transportation is concerned with motor vehicles but also with transit, biking, walking, aviation, and ferries. It is concerned with the ease with which people can travel by two or more modes, such as efficient mode-chaining between transit and ferries. And while Island Access is concerned with the movement of people – by any combination of car, bus, bike, ferry, boat, vanpool, carpool, and foot – this plan takes a keen interest also in the mobility of goods and services that keep local and state economies strong.^v

Engagement goals

- Generate awareness of study and commitment to share outcomes.
- Promote and encourage fair and equal opportunities for the public to participate in this work by providing various ways to engage with WSDOT and its partners.
- Seek to discover unknown pinch points in the corridor experienced by those who regularly travel this section of highway.
- Foster strong relationships that lay the groundwork for future engagement opportunities.
- Demonstrate partnership with regional partners like IRTPO, PSRC and transit.

Target audience

- Primary – community and transit partners and regular travelers and users of the corridor
- Secondary – freight and long-distance travelers
- Influencers – local elected officials and media

Key messages

- The purpose of this analysis is to identify if the SR 532 corridor is performing within regional transportation performance expectations. If problems and needs are found the study would move into the next phase to identify alternatives with support through meaningful public engagement-

- Safety is our top priority – this study will provide us with a better idea of where the corridor is experiencing more crashes, the severity of these crashes and the characteristics and patterns associated with these incidents.
- Safety and mobility needs have already been identified in the IRTPO Regional Plan and the Stanwood Comprehensive Plan for SR 532. Additionally in 2017 WSDOT found that this area may warrant additional review to determine if the facility is meeting regional performance objectives and to implement action items identified in the Island Regional Transportation Plan, Stanwood Comprehensive Plan, Snohomish Comprehensive Plan and transit agency plans.
- This isn't *just* about traffic – WSDOT is committed to connecting Washington communities for a healthy and prosperous future. We recognize that communities have different transportation needs and invite the public to share the needs of their respective community with us – stakeholders may include bicycle and pedestrian networks, freight, ports and rail, transit and aviation.
- WSDOT supports a practical solutions approach – this means making the right investment, at the right place, at the right time in collaboration with our partners.
- We are committed to sharing the findings of this analysis in a transparent and public way.

Communication strategies

- **Speak with a unified voice:** We will support our study partners by providing regular updates and messaging to be used as a framework for all public communications about this study. We want to avoid sending mixed messages to the public, our partners, elected officials and the media. Study partners will be able to speak to how the outcomes of the study may share their goals,
- **Manage expectations:** We will help all stakeholders understand the scope of this analysis and what WSDOT may and may not be able to do as a result of this work.
- **Not a one-size-fits-all strategy:** This plan recognizes that stakeholders have different ways of receiving information and we will need to tailor communications to different audiences.
- **No surprises:** We are the first and best source of information whether the news is good or bad. We anticipate stakeholder needs and provide the information needed in advance.
- **Plain talk:** We speak in language people understand and use themselves.

Key dates

- Spring/Summer 2022: Online public survey
- Summer 2022: Data analysis
- Late summer 2022: Baseline report drafted and finalized
- Fall 2022: Share results with community, partners, stakeholders, elected officials and media

Communication outcomes

- Receive input from at least 250 stakeholders encompassing a diverse cross-section of the community.
- Receive positive public mention of this study in local media or public community communication.
- Receive one invite to share results of this analysis with a community organization or partner or local media.

Potential obstacles, risks and opportunities

- RISK: Partners share contradictory or confusing messaging with the public.
 - MITIGATION: WSDOT will lead communications and provide regular updates to study partners including elected officials (specifically Commissioner Janet St. Clair, Mayor Sid Roberts Stanwood, and Councilmember Nate Nehring).
- RISK: Timeline is too short to achieve meaningful public engagement.
 - MITIGATION: Prioritize engagement activities and be flexible with availability to facilitate conversations.
 - MITIGATION: Cast a wide net to achieve meaningful diverse engagement.
- RISK: Ongoing COVID-19 fatigue/summer schedules prevent stakeholders from responding.
 - MITIGATION: Provide different ways of receiving information and tailor communications to different audiences.
- RISK: Stakeholders expect WSDOT to “fix” all the things they identify as unsafe or problematic in this area.
 - MITIGATION: Set clear expectations that this is the information gathering phase of the work and why.

Communications tool options:

- Media release
- Social media (Twitter, Facebook, Blog, YouTube)
- Public engagement opportunities
- Letters to public officials
- Partners publicize through their direct channels

ⁱ Island County Comprehensive Plan https://www.islandcountywa.gov/Planning/Documents/CompPlan/2016_08-Transportation.pdf

ⁱⁱ Snohomish County Transportation Element Comprehensive Plan <https://snohomishcountywa.gov/DocumentCenter/View/6451/Transportation-Element-A-Component-of-the-GMA-Comprehensive-Plan?bidId=>

ⁱⁱⁱ Island Transit <https://irp.cdn-website.com/ac3d33af/files/uploaded/2021-2026%20Transit%20Development%20Plan%20-%20FINAL.pdf>

^{iv} Community Transit: https://www.communitytransit.org/docs/default-source/programs/journey-2050---long-range-plan/ct_lrp_planningcontextsummary_2-1-2022-93.pdf?sfvrsn=c74c5e04_2

^v IRTPO Island Access 2040

https://www.islandcountywa.gov/PublicWorks/Roads/Planning/Documents/Island%20Access%202040_Adopted%2009-25-2019.pdf

Appendix B SR 532 Traffic Operations Analysis

TECHNICAL REPORT

SR 532 TRAFFIC OPERATIONS ANALYSIS

Island County Camano Island / City of Stanwood / Snohomish County

MP 0.00 to 10.09

July 2022

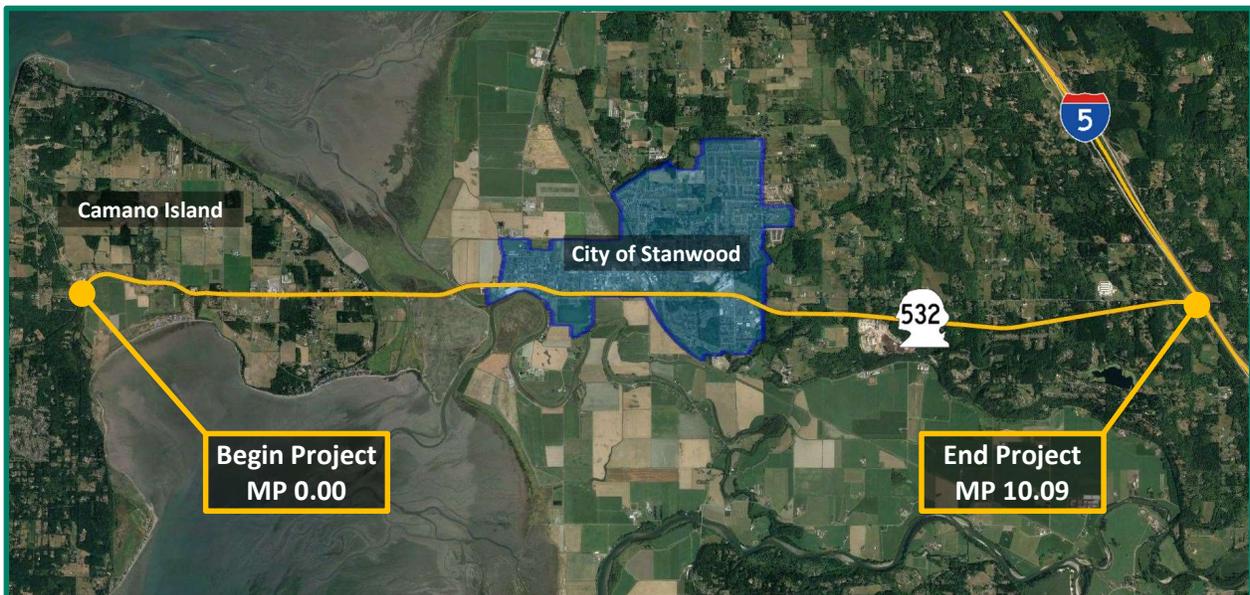


**Washington State
Department of Transportation**

Northwest Region
Mount Baker Area Traffic Operations
1019 Andis Rd, NB82-210
Burlington, WA 98233-3432

Project Overview and Existing Network

The SR 532 corridor from MP 0.00 to 10.09 is located in Island and Snohomish Counties beginning on Camano Island, passing through the City of Stanwood and terminating at an I-5 interchange. This section of highway carries, on average, between 12,000 and 22,000 vehicles per day (2021 ADT), and serves as the sole land connection for Camano Island via the Davis Slough bridge. In addition to providing a key connection to the I-5 corridor for Camano/Stanwood residents, SR 532 also functions as a primary downtown main street through the City of Stanwood. The vicinity map below shows the extents of the operational analysis.



The existing corridor network varies in character from rural areas on Camano Island and near the I5 interchange to more urbanized areas through the City of Stanwood. Speeds vary from 35 mph to 55 mph, and the highway is designated as a Rural Minor Arterial, except within the Stanwood city limits where it is an Urban Minor Arterial.

The roadway generally includes one lane for each direction of travel with widening to accommodate turn lanes at intersections, as well as truck climbing/passing lanes where speeds are high and grades become steep. Access management classifications include Managed Class 2, Managed Class 4, Partial Limited, and Full Limited access. Truck percentage ranges from 2.8% to 5.6%, and the roadway is currently classified as a T3 freight corridor with the transport of 2.8 to 3.1 million tons of freight per year.

There are three Park and Ride locations along SR 532 at Terry's Corner (MP 0.00), downtown Stanwood (4.90) and at the I5 interchange (9.94). Transit service is provided by both Community Transit and Island Transit, with multiple routes utilizing the state highway for both local and regional trips. The corridor currently does not provide any designated bike lanes, and none are currently proposed due to existing high speeds and high vehicle volumes.

The existing corridor network includes intersections at the following locations:

Intersection	MP	ADT (2021)	Truck %	Posted Speed (mph)	Intersection Control	Access Control	Func. Class	Terrain
N Sunrise Blvd	0.00	19,000	2.8%	45	Signal	M2	R2	Rolling
Hanstad Rd	0.57	21,000	2.7%	45	TWSC	M2	R2	Rolling
Heichel Rd	0.82	21,000	2.5%	45	TWSC	M2	R2	Rolling
Fox Trot Wy	1.10	21,000	2.6%	45	TWSC	M2	R2	Rolling
Rekdal Rd	1.34	21,000	3.1%	45	TWSC	M2	R2	Rolling
Good Rd	1.85	21,000	3.2%	45	TWSC	M2	R2	Rolling
Smith Rd	2.38	21,000	3.1%	45	TWSC	M2	R2	Rolling
104th Dr NW	3.86	22,000	3.3%	35	TWSC	M4	U2	Rolling
103rd Dr NW	3.92	22,000	3.6%	35	TWSC	M4	U2	Rolling
102nd Dr NW	3.97	22,000	3.7%	35	TWSC	M4	U2	Rolling
102nd Ave NW	4.03	22,000	3.7%	35	Signal	M4	U2	Rolling
Camano St	4.11	19,000	3.6%	35	TWSC	M4	U2	Rolling
98th Dr NW	4.25	19,000	3.7%	45	TWSC	LA - Partial	U2	Rolling
92nd Ave NW	4.65	19,000	3.4%	45	Signal	LA - Partial	U2	Rolling
88th Ave NW	4.90	19,000	4.2%	45	Signal	LA - Partial	U2	Rolling
Pioneer Hwy	5.25	19,000	4.7%	45	Signal	LA - Partial	U2	Rolling
72nd Ave NW	5.90	17,000	3.9%	45	Signal	LA - Partial	U2	Rolling
64th Ave NW	6.45	17,500	4.0%	55	TWSC	LA - Partial	R2	Rolling
36th Ave NW	8.22	18,000	4.3%	55	TWSC	LA - Partial	R2	Rolling
28th Ave NW	8.74	18,000	4.4%	55	TWSC	LA - Partial	R2	Rolling
19th Ave NW	9.30	18,000	4.3%	55	TWSC	LA - Partial	R2	Rolling
12th Ave NW	9.79	18,000	4.7%	40	TWSC	LA - Partial	R2	Rolling
Old 99 N	9.94	18,000	4.8%	40	Signal	LA - Partial	R2	Rolling
I5 SB Ramps	10.00	18,000	5.2%	40	TWSC	LA - Full	R2	Rolling
I5 NB Ramps	10.09	12,000	4.9%	40	Signal	LA - Full	R2	Rolling

 = Stanwood city limits

Data Collection and Processing

Traffic volume data was collected at all 25 network intersections between 4/6/2022 and 6/1/2022, using a third-party optical counting system, operated by MioVision. The data collection and post-processing included 24-hour traffic volume, turning movement volume, vehicle classifications and peak hour factors. These volumes were then balanced throughout the corridor, and the final modeled volumes are shown in Appendix B.

Volume data from permanent traffic recorder locations on I5 near the SR 532 interchange were used to determine any adjustments required to account for volume reductions stemming from COVID-19 travel restrictions. These volumes were found to be within 3% to 5% of those observed in 2019, suggesting that traffic volumes in the area have largely stabilized and returned to near pre-COVID levels, and no additional adjustments are warranted at this time.

Level of Service Definition and Standard

Level of Service (LOS) is a qualitative description of the operating performance of an element of transportation infrastructure such as a roadway or an intersection. Intersection LOS, as defined in the Highway Capacity Manual 6th Edition (HCM) shown in the table below, is expressed as a letter score from A to F, depending on both control type and vehicle delay.

LOS	Signalized Delay (sec/veh)	AWSC Delay (sec/veh)	TWSC Delay (sec/veh)
A	≤ 10	0 - 10	0 - 10
B	> 10 - 20	> 10 - 15	> 10 - 15
C	> 20 - 35	> 15 - 25	> 15 - 25
D	> 35 - 55	> 25 - 35	> 25 - 35
E	> 55 - 80	> 35 - 50	> 35 - 50
F	> 80	> 50	> 50

HCM 6th Edition Level of Service Thresholds for Intersections

As a Highway of Regional Significance (non-HSS) the LOS standards for this facility is set by the Puget Sound Regional Council (PSRC). SR 532 is designated a Tier 2 route by PSRC, with an adopted Level of Service standard for peak hour operation of LOS D.

Existing Conditions Analysis

An existing network model was developed using TrafficWare Synchro version 11 to evaluate the existing LOS at every intersection along the SR 532 corridor. This software applies HCM 6th Edition methodology to determine LOS for signalized and stop controlled intersections. Queue lengths were also evaluated using HCM 6th Edition; however, the queue lengths were refined further using TrafficWare SimTraffic microsimulation, which is generally accepted as producing more accurate queue results for intersections compared to deterministic methods.

The results of the existing conditions analysis are summarized the following table.

Existing Configuration Operational Analysis Summary

SR 532 Corridor, MP 0.00 to 10.09 (Analysis Year 2022)

Intersection of SR 532 &	Control	AM		Level of Service	PM		Level of Service	Meets LOS Standard?
		95th %tile Queue (ft)	Delay (sec/veh)		95th %tile Queue (ft)	Delay (sec/veh)		
N Sunrise Blvd		428 (NB)	27.0	C	435 (SB)	30.8	C	Yes
Hanstad Rd ²		-	11.9	B	-	20.3	C	Yes
Heichel Rd ²		30 (SB)	17.0	C	34 (SB)	30.4	D	Yes
Fox Trot Wy ²		40 (NB)	23.3	C	39 (NB)	43.4	E	No
Rekdal Rd ²		36 (SB)	33.9	D	38 (NB)	35.3	E	No
Good Rd ²		55 (SB)	152.7	F	70 (SB)	338.5	F	No
Smith Rd ²		49 (NB)	71.8	F	51 (NB)	130.3	F	No
104th Dr NW ²		76 (NB)	56.8	F	84 (EB)	34.8	D	No
103rd Dr NW ²		32 (SB)	48.9	E	80 (EB)	41.1	E	No
102nd Dr NW ²		100 (EB)	33.0	D	159 (EB)	22.6	C	Yes
102nd Ave NW		263 (WB)	14.5	B	506 (WB)	25.4	C	Yes
Camano St ²		61 (EB)	13.5	B	180 (WB)	20.7	C	Yes
98th Dr NW ²		42 (NB)	25.5	D	50 (NB)	27.9	D	Yes
92nd Ave NW		292 (EB)	10.9	B	362 (WB)	14.7	B	Yes
88th Ave NW		434 (EB)	18.3	B	319 (WB)	15.2	B	Yes
Pioneer Hwy		249 (WB)	18.8	B	419 (WB)	23.2	C	Yes
72nd Ave NW		398 (EB)	28.4	C	361 (WB)	24.2	C	Yes
64th Ave NW ²		67 (SB)	65.0	F	62 (SB)	94.2	F	No
36th Ave NW ²		48 (NB)	45.8	E	33 (NB)	38.3	E	No
28th Ave NW ²		51 (NB)	33.5	D	42 (NB)	62.7	F	No
19th Ave NW ²		19 (NB)	18.0	C	17 (NB)	17.8	C	Yes
12th Ave NW ²		51 (SB)	67.2	F	55 (SB)	112.4	F	No
Old 99 N		271 (EB)	11.0	B	173 (WB)	29.8	C	Yes
I5 SB Ramps ²		50 (SB)	14.4	B	63 (SB)	32.9	D	Yes
I5 NB Ramps		113 (NB)	8.6	A	207 (NB)	28.7	C	Yes

1. Intersection control delay, sec/veh

2. TWSC delay is reported for the worst (highest delay) movement, sec/veh

Analysis Results and Discussion

The existing configuration analysis shows that most intersections, including all signalized intersections within the network, are currently operating at or better than the adopted LOS D minimum in both the AM and PM peak periods. Volume, delay, and queues are typically higher in the PM peak hour compared to the AM peak.

Eastbound volumes are significantly higher than westbound volumes during the AM peak, and the opposite is true for the PM peak hour. Additionally, volumes remain fairly consistent in magnitude throughout the corridor, suggesting that typical traffic patterns are commuter-oriented, with limited local trips occurring on a typical weekday.

Several intersections along the corridor meet the minimum LOS D, but are at risk of degradation of performance if volumes increase in the future. These intersections include Heichel Rd, Rekdal Rd, 102nd Dr NW, 28th Ave NW, and the I5 SB ramps. These intersections should be periodically evaluated to determine if LOS standards continue to be met.

There are 10 intersections along the corridor which are currently operating below the adopted LOS D for this highway, including several intersections on Camano Island and portions of the Stanwood downtown core. Vehicles on minor legs at these intersections are experiencing a moderate-to-high delay due to heavy conflicting volume along mainline. The resulting queues at these intersections are relatively short in length due to low volume, ranging from 2 to 4 vehicles long, despite the high calculated delay. Because of these short queues, real-world driver experience at these intersections may not be perceived as severe as the calculated control delay suggests.

If you have any further questions, please contact Mike Koidal at (360) 757-5985 or Shane Sullivan at (360) 757-5881.

Appendix C SR 532 Safety Analysis

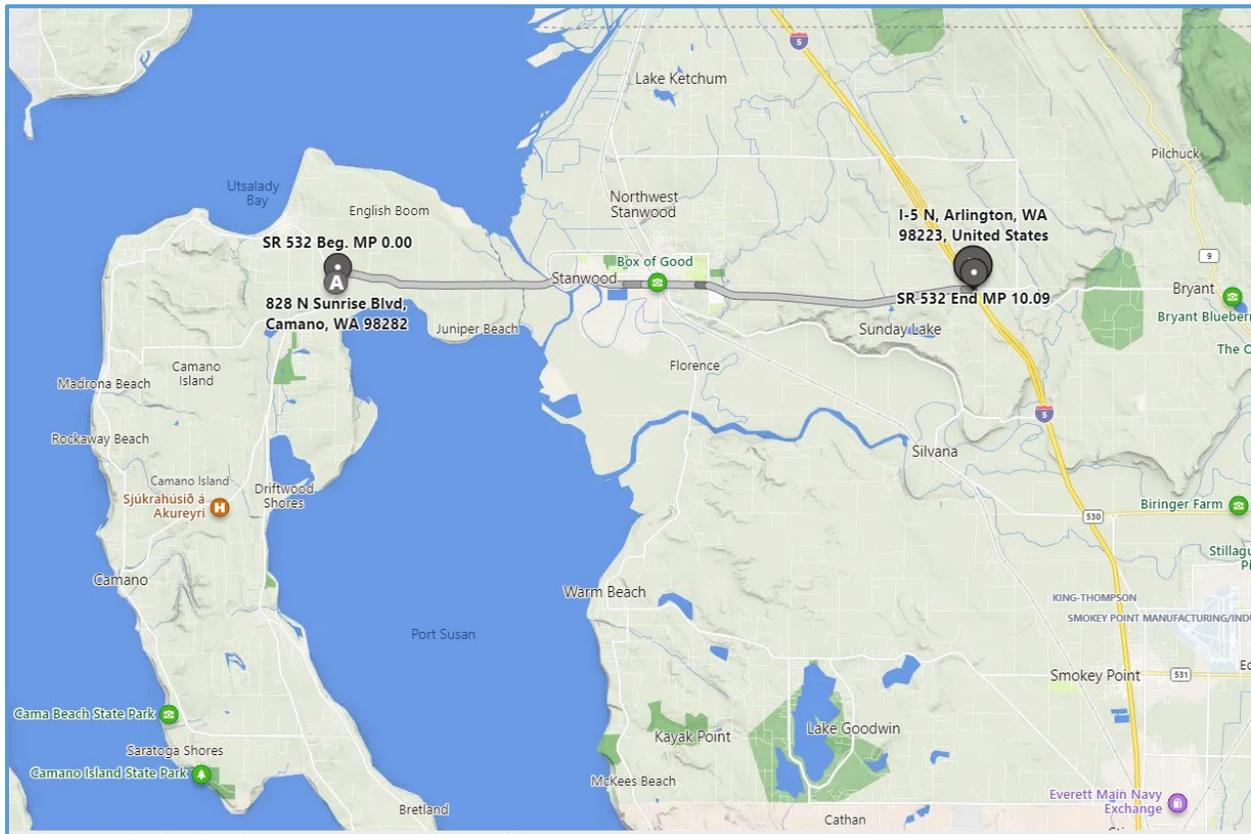
TECHNICAL REPORT

SR 532 SAFETY ANALYSIS (Final)

Island County Camano Island / City of Stanwood / Snohomish County

MP 0.00 to 10.09

November 2022



WSDOT NWR | Traffic Office – Traffic Safety Management

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Background

SR 532 is an east-west minor arterial extending from Terry's Corner on Camano Island at MP 0.00 to I-5 interchange at MP 10.09. Regarding the functional class of the highway, this route is divided into three segments: the first and last segments have minor rural arterial functional classes and the middle segment from MP 3.38 to MP 6.45 is classified as a minor urban arterial within the City of Stanwood.

SR 532 is a two-lane two-way highway with a minimum lane width of 11 ft. and minimum shoulder width of 4 ft. The posted speed of SR 532 varies between 35 mph and 55 mph. Two-way left turn lanes are provided from MP 1.68 to MP 2.38, and within the City of Stanwood from MP 3.80 to MP 4.25. In addition, left-turn channelization is provided at both signalized and stop-controlled intersections. Truck climbing lanes are present for EB traffic from MP 5.25 to MP 5.83, and from MP 7.21 to MP 8.15, as well as WB traffic from MP 2.23 to MP 2.63.

This study reviews the crashes occurring on SR 532 from the beginning of the highway at MP 0.0 to the end at MP 10.09 during a five-year period from 01/01/2016 to 12/31/2020.

Abbreviations

A list of abbreviations used throughout the report are:

AC = entering at angle crash	ODLT = opposite direction 1 LT-1 STR
CC = contributing circumstances	Ped = pedestrian
Dir. = direction	PDO = property damage only/no apparent injury
DNG R/W = did not grant right-of-way	PI = possible injury
EB = eastbound	RE = rear-end crash
EI = evident injury/suspected minor injury	ROTR = run-off-the-road
FA = field assessment	RT = right turn
FO = fixed object	SD – misc. = same dir. – misc.
IAL = intersection analysis location	SB = southbound
I/S = intersection	SI = serious injury/suspected serious injury
ISIP = intersection safety improvement plan	SS = sideswipe
LT = left turn	TWLTL = two-way left turn lane
LTL = left turn lane	V, Veh = vehicle
MC = motorcycle	WB = westbound
MP = milepost	
NB = northbound	
OD = opposite direction	

Safety Study (HAL/HAC/CAL/CAC/IAL/ISIP/FA) History

Table 1 below shows all locations that have been reviewed as part of our highway safety improvement program (HSIP) within the study corridor since 01/01/2010 to present.

Table 1. Safety Study History (01/01/2010 – 08/25/2020)

Year	Type	Description	Begin MP	End MP
2010	IAL	Good Rd 4-leg I/S	1.85	1.85
2010	IAL	88 th Ave NW	5.90	5.90
2012	IAL	98 th Ave NW I/S	4.25	4.25
2014	CAL	1/2 Mi N of Sunrise Blvd to Vineyard Rd (R15)	0.48	1.73
2015	ISIP	Hanstad Rd I/S	0.57	0.57
2015	ISIP	Good Rd	1.85	1.85
2017-2018	FA	SR 532 MP 0.00-10.09 Field Operation Assessment	0.00	10.09

Crash Analysis

From 2016 to 2020, 479 crashes occurred on SR 532, 31% of which were fatal or injury crashes. There were an additional 81 crashes in 2021.

Table 2. SR 532 MP 0.00-10.09 Crash Severities by Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Fatal		1				1	0%	1
Suspected Serious Injury	1	4	1	3	3	12	3%	1
Suspected Minor Injury	7	11	7	6	5	36	8%	10
Possible Injury	28	16	25	22	7	98	20%	16
No Apparent Injury	59	81	73	64	51	328	68%	53
Unknown	1	2			1	4	1%	
Total	96	115	106	95	67	479	100%	81

Table 3. SR 532 MP 0.00-10.09 Crash Types by Year

Crash Type	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Rear-end	71	64	71	57	32	295	62%	45
Entering at angle	6	22	14	11	7	60	13%	7
Fixed object	9	10	5	7	9	40	8%	7
Opp Dir 1LT-1STR	3	6	5	6	2	22	5%	8
Sideswipe	1	5	2	7	7	22	5%	6
Opposite direction	3	2	2	2	5	14	3%	3
Same Dir-Misc.	1	2	4	1	2	10	2%	3
Animal	1	2	1	3	2	9	2%	1
Misc.			1		1	2	0%	
Parking	1		1			2	0%	
Overturn				1		1	0%	1
Pedestrian		1				1	0%	
Fire		1				1	0%	
Total	96	115	106	95	67	479	100%	81

Fatal and serious injury (SI) crash descriptions are as follows:

Fatal Crashes:

- 1- MP 5.29 (03/17/2017 - Friday - @ 06:44) Ped - V1 traveling EB on SR 532 crossed the SR 532/Pioneer Highway I/S and struck a pedestrian who attempted cross SR 532 not at a crosswalk east of the I/S. This crash occurred on dry surface and in dark- street lights on condition. CC- None

There was 1 additional fatal crash in 2021 as described below:

- 1- MP 7.60 (11/25/2021 - Thursday - @ 15:52) RE - V1 and V2 traveling WB on SR 532 and V1 rear-ended V2 causing V2 to rotate into the EB lane. V2 was struck on EB lane by V3 and V4 traveling EB on SR 532. This collision occurred on wet surface and in daylight condition. CC- speed

SI Crashes:

- 1- MP 0.51 (09/04/2019 - Wednesday - @ 16:00) RE - V1 (MC) and V2 traveling WB on SR 532. V2 slowed down to stop for the traffic ahead and got struck by V1 from behind. This collision occurred on wet surface and in daylight condition. CC- speed
- 2- MP 0.75 (02/10/2018 - Saturday - @ 15:01) AC - V1 entered the SR 532 EB lane from a private driveway. V1 struck V2 traveling EB on SR 532 on dry surface and in daylight. CC- DUI
- 3- MP 1.09 (06/29/2017 - Thursday - @ 15:51) OD - V1 was traveling EB on SR 532 at a high rate of speed. V1 lost control and crossed over the centerline and struck V2 traveling WB. This collision occurred on dry surface and in daylight. CC- Speed
- 4- MP 2.20 (12/28/2017 - Thursday - @ 08:50) ODLT - V1 was traveling EB on SR 532 attempted to make a LT into a business on the north side of SR 532. V1 collided with V2 traveling WB on SR 532. This collision occurred on dry surface and in daylight. CC- DNG R/W
- 5- MP 2.84 (06/25/2020 - Thursday - @ 08:38) OD - V1 was traveling EB on SR 532 crossed over the centerline and struck V2 and V3 traveling WB. This collision occurred on dry surface and in daylight. CC- Other
- 6- MP 3.84 (12/17/2017 - Sunday - @ 14:51) ODLT - V1 was traveling EB on SR 532 attempted to make a LT into a business on the north side of SR 532 from the two-way LTL. V1 collided with V2 traveling WB on SR 532. This collision occurred on wet surface and in daylight. CC- DNG R/W
- 7- MP 4.62 (09/17/2019 - Tuesday - @ 13:43) FO - V1 was traveling EB on SR 532 at a high rate of speed, lost control, and collided with the blackberry bushes in the right-side ditch. This crash occurred on dry surface and in daylight condition. CC- None
- 8- MP 4.90 (01/19/2020 - Sunday - @ 16:23) AC - V1 traveling EB on SR 532 entered the SR 532/ 88th Ave NW I/S when the signal was red. V1 was struck by V2 traveling SB on 88th Ave NW on dry surface and in dusk condition. CC- Driver distraction
- 9- MP 5.11 (07/05/2020 - Sunday - @ 04:45) OD - V1 was traveling WB on SR 532 drifted into the EB lane and collided with EB traveling V2. This collision occurred on dry surface and in dawn condition. CC- Driver distraction
- 10- MP 5.25 (02/19/2016 - Friday - @ 20:27) ODLT - V1 was traveling NB on Pioneer Highway and attempted to make a LT to SR 532 WB at the I/S. V1 was struck by V2 that was traveling SB on Pioneer Highway. This collision occurred on wet surface and in dark-street lights on condition. CC- DNG R/W
- 11- MP 6.45 (01/16/2019 - Wednesday - @ 19:13) AC - V1 traveling WB on SR 532 approached the 64th Ave NW I/S. V2 was stopped at the Stop sign. V1 drifted to the outside of the travel lane

and struck V2 that started accelerating to avoid the crash. This collision occurred on dry surface and in dark-street lights on condition. CC- Speed

- 12- MP 9.94 (04/17/2017 - Monday - @ 16:23) AC - V1 traveling WB on SR 532 ran the red light and entered the I/S with Old Highway 99. V1 collided with V2 (MC) traveling NB on Old Highway 99. This collision occurred on dry surface and in daylight condition. CC- Disregard control

1 additional serious injury crash occurred in 2021 as described below:

- 1- MP 9.33 (10/12/2021 - Tuesday - @ 15:02) SS - V1 was traveling WB on SR 532 east of 267th St NW I/S in lane 2 of 2. Vehicles in front of V1 slowed down due to a vehicle turning left. V1 swerved to the right to avoid striking V3 in front of it and sideswiped V2 traveling WB in lane 1. Then V1 began to spin and collided with the rear of V3. This crash occurred on wet surface and in daylight condition. CC- Speed

Table 4. SR 532 MP 0.00-10.09 Crash Contributing Causes by Year

Contributing Circumstance	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Inattention	34	36	45	27		142	30%	
Following	16	15	10	17	16	74	15%	26
Driver Distraction	7	8	10	4	19	48	10%	9
Did Not Grant RoW	4	15	7	10	8	44	9%	11
Other	10	9	9	8	5	41	9%	2
Speed	7	6	8	10	2	33	7%	9
None	4	9	5	8	4	30	6%	5
DUI	6	6	4	5	1	22	5%	6
Improper Action		4	4	1	7	16	3%	5
Sleep/fatigue	3		1	2	3	9	2%	3
Defective Equip	2	1	1	2	1	7	1%	4
Disregard Control	1	4	1	1		7	1%	
Illness/meds	1	1	1			3	1%	1
Over Center Line	1	1				2	0%	
(Blank)					1	1	0%	
Total	96	115	106	95	67	479	100%	81

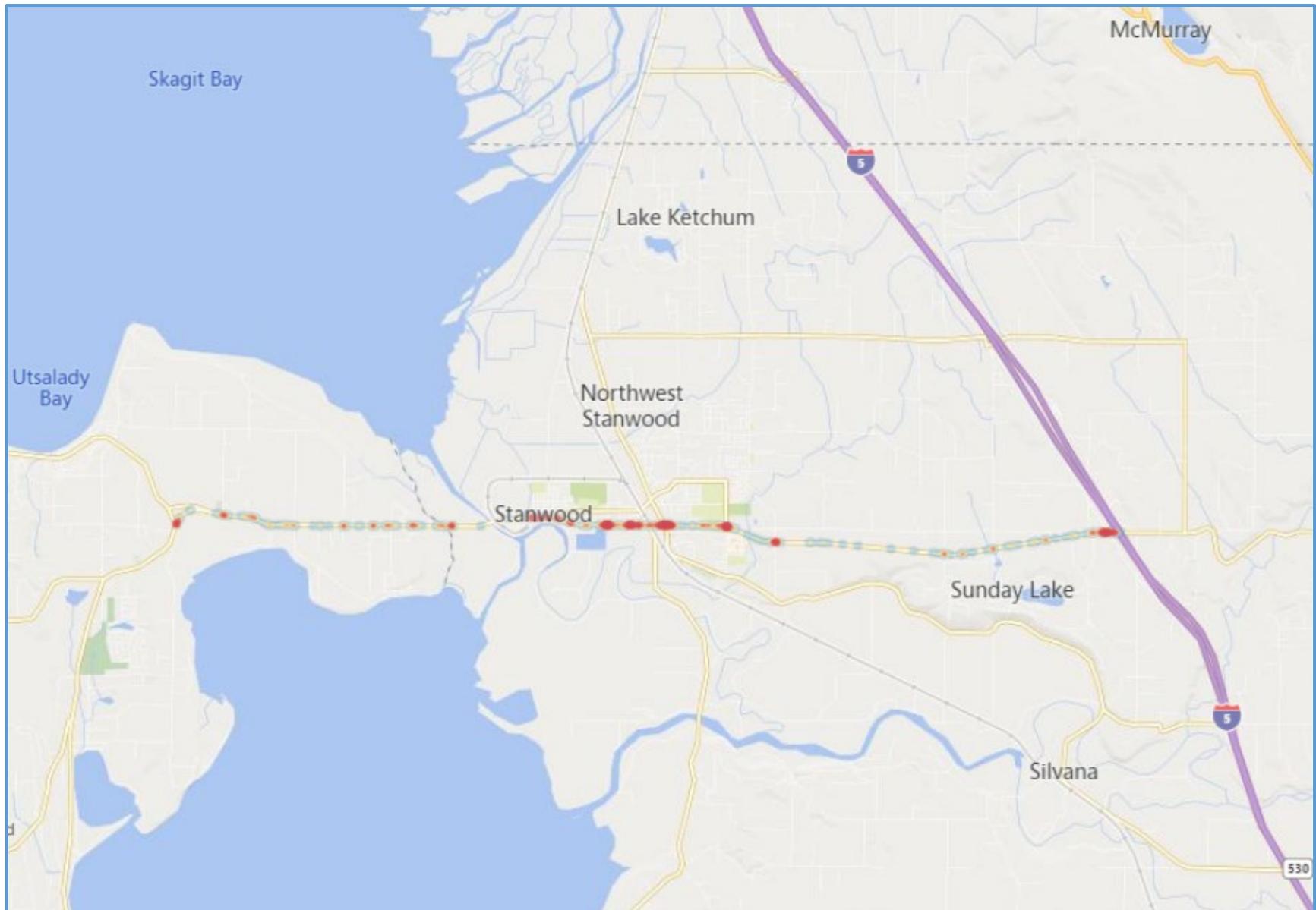


Figure 1. SR 532 MP 0.0 to 10.09 Crash Heat Map (01/01/2016-12/31/2020)

UNDER 23 U.S. CODE §148 AND 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 CRASH 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.

Run-Off-the-Road (ROTR) Crashes

There were 41 ROTR (including fixed object (FO) and overturn (OT)) crashes on the study corridor from 01/01/2016 to 12/31/2020.

Table 5. SR 532 MP 0.00-10.09 ROTR Crashes by Severity and Year

	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Serious Injury				1		1	2%	
Suspected Minor Injury	1	1		2	2	6	15%	2
Possible Injury	3	1	1	1		6	15%	
No Apparent Injury	4	7	4	4	6	25	61%	6
Unknown	1	1			1	3	7%	
Total	9	10	5	8	9	41	100%	8

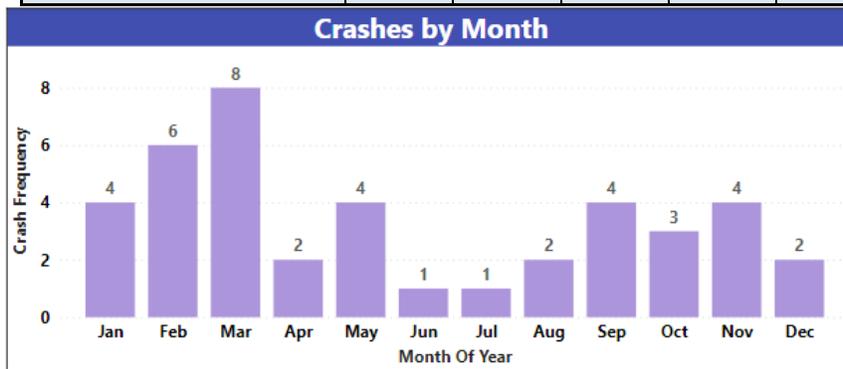


Figure 2. SR 532 MP 0.00-10.09 ROTR Crashes by Month (01/01/2016-12/31/2020)

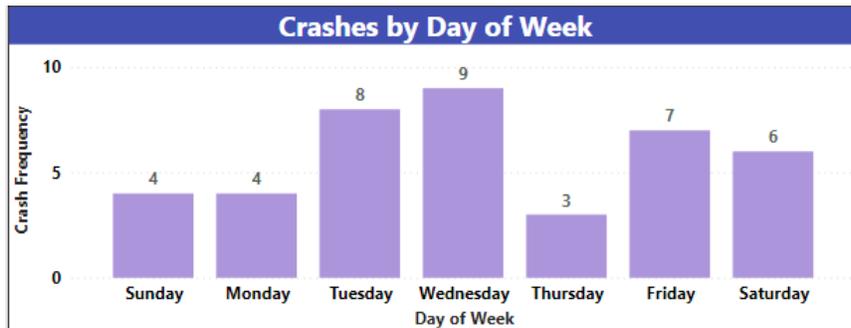


Figure 3. SR 532 MP 0.00-10.09 ROTR Crashes by Day of Week (01/01/2016-12/31/2020)

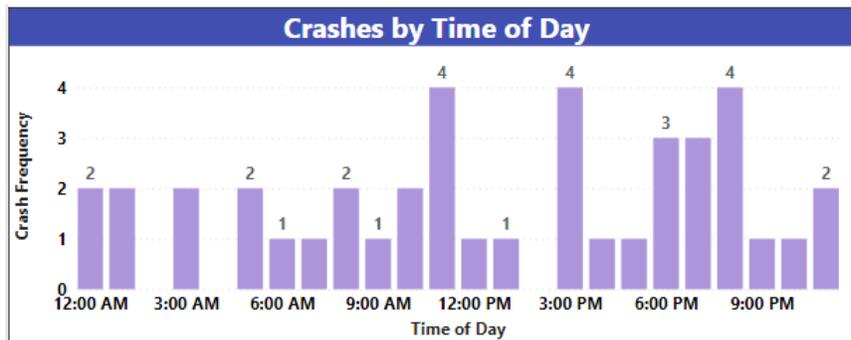


Figure 4. SR 532 MP 0.00-10.09 ROTR Crashes by Time of Day (01/01/2016-12/31/2020)

Other ROTR crash characteristics are as follows:

- 20 (49%) in either dark, dawn, or dusk
- 18 (44%) on either wet, snowy, or icy surface
- 8 (20%) were intersection/driveway related crashes
- Contributing cause (CC): 10 DUI, 5 sleep/fatigue, 4 ea. speed & driver distraction, and 2 ea. improper action, inattention, defective equip., & illness/meds
- V1 Dir. & first impact location:
 - o **20 EB** (13 EB & EB past right or right shoulder + 7 EB & WB past right or right shoulder)
 - o **19 WB** (15 WB & WB past right or right shoulder + 4 WB & EB past right or right shoulder)
 - o 1 NB & WB past right shoulder + 1 SB & EB past right shoulder

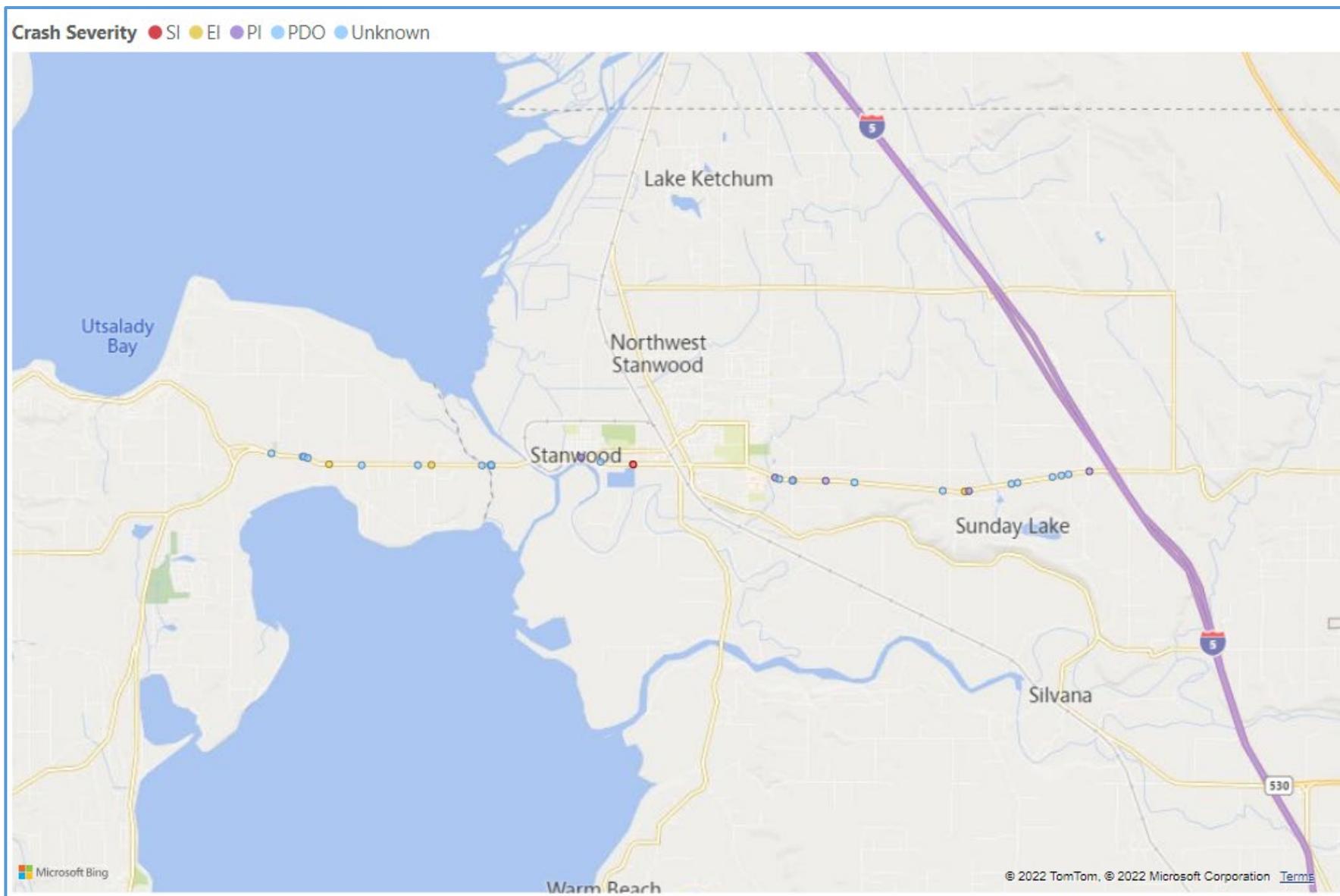


Figure 5. SR 532 MP 0.00-10.09 ROTR Crashes (01/01/2016-12/31/2020)

Entering at Angle Crashes (AC)

From 01/01/2016 to 12/31/2020, during a 5-year period, 60 angle crashes occurred on SR 532 within the study corridor.

Table 6. SR 532 MP 0.00-10.09 Angle Crashes by Severity and Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Serious Injury		1	1	1	1	4	7%	
Suspected Minor Injury		3	2	2		7	12%	
Possible Injury	4	3	3	3	2	15	25%	2
No Apparent Injury	2	15	8	5	4	34	57%	5
Total	6	22	14	11	7	60	100%	7

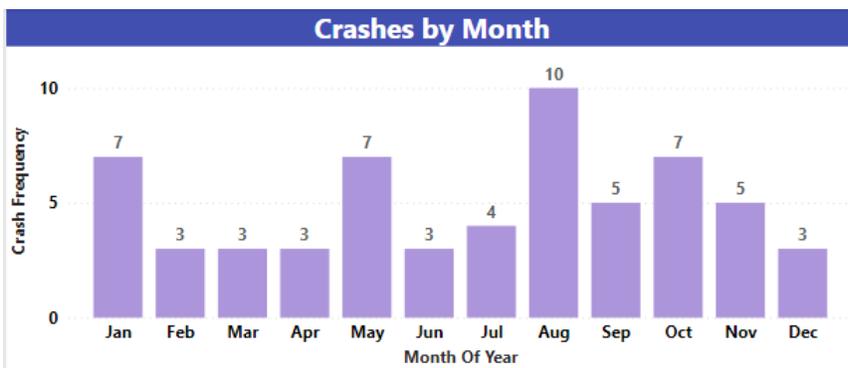


Figure 6. SR 532 MP 0.00-10.09 Angle Crashes by Month (01/01/2016-12/31/2020)

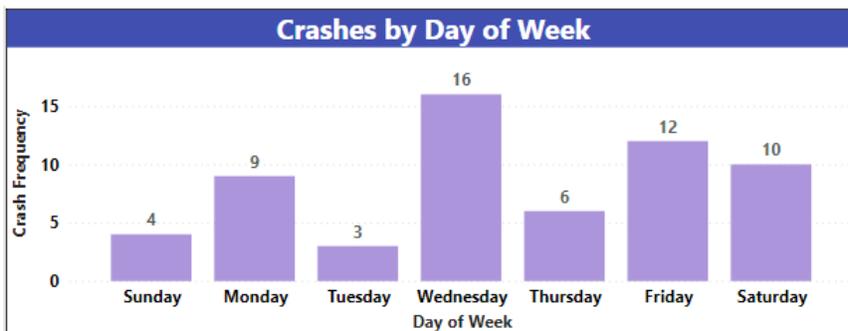


Figure 7. SR 532 MP 0.00-10.09 Angle Crashes by Day of Week (01/01/2016-12/31/2020)

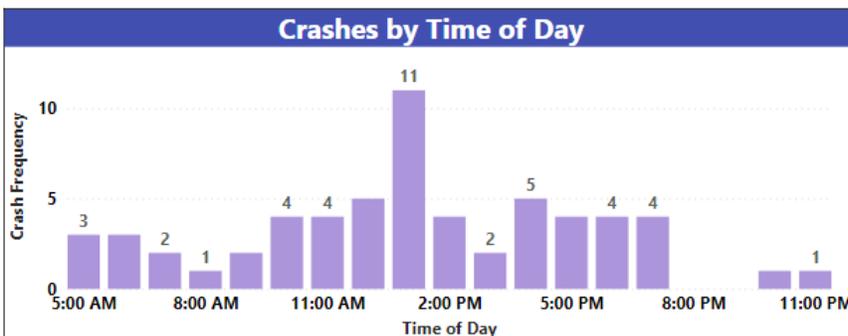


Figure 8. SR 532 MP 0.00-10.09 Angle Crashes by Time of Day (01/01/2016-12/31/2020)

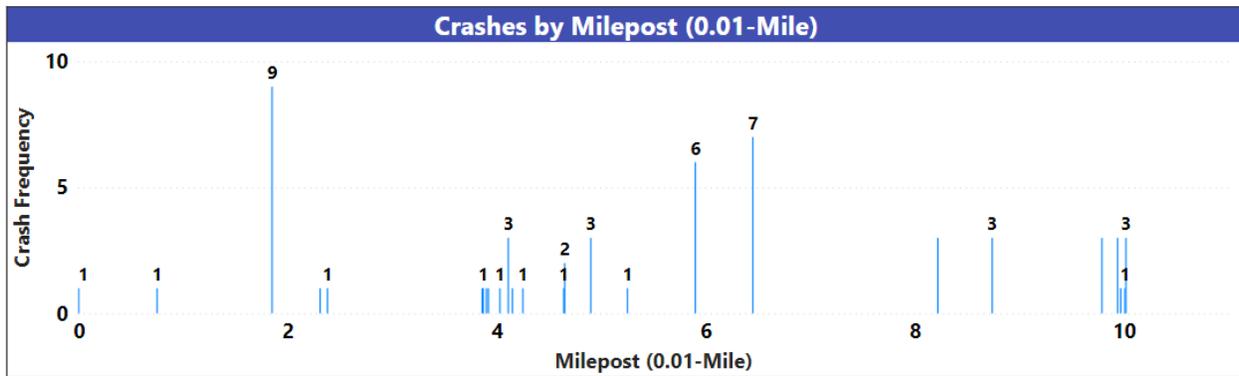


Figure 9. SR 532 MP 0.00-10.09 Angle Crashes by Milepost (01/01/2016-12/31/2020)

Other angle crash characteristics are as follows:

- 56 at intersections, and 4 at driveways
- 15 (25%) in either dark, dawn, or dusk
- 16 (27%) on wet surface
- Contributing cause: 22 DNG R/W, 10 inattention, 8 improper action, 5 disregard control, 2 ea. driver distraction, speed, & DUI, and 1 over center line
- V1 vs V2 Dir.
 - o 4 EB vs SB
 - o 12 WB vs 12 SB & 1 WB vs NB
 - o 9 NB vs EB & 5 NB vs WB
 - o 26 SB vs WB & 2 SB vs EB & 1 SB vs NB

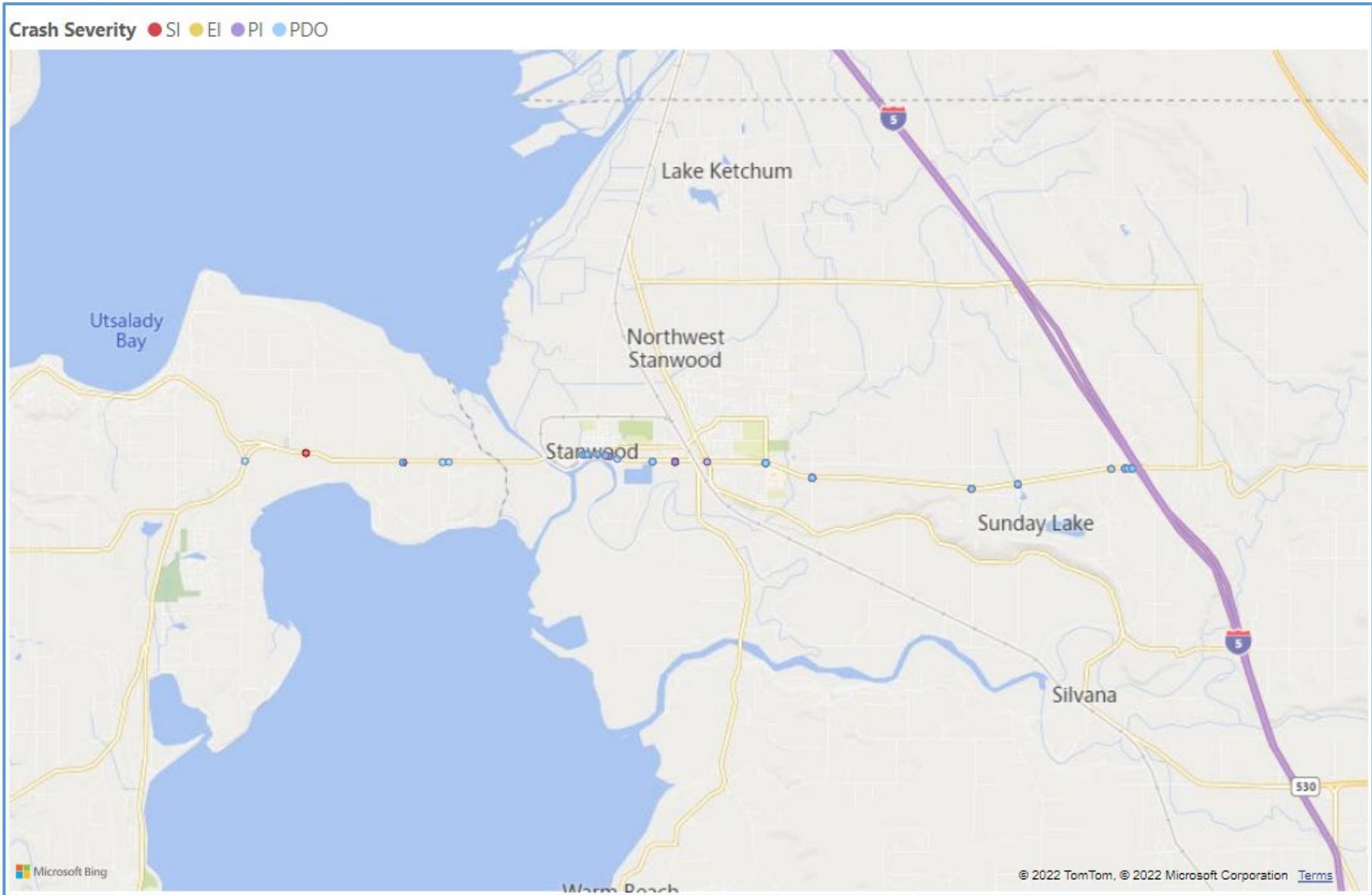


Figure 10. SR 532 MP 0.00-10.09 Angle Crashes (01/01/2016-12/31/2020)

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Opposite Direction 1LT-1STR (ODLT) Crashes

During last five years, from 01/01/2016 to 12/31/2020, 22 ODLT crashes occurred on SR 532 within the study corridor.

Table 7. SR 532 MP 0.00-10.09 ODLT Crashes by Severity and Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Serious Injury	1	2				3	14%	
Suspected Minor Injury		1				1	5%	
Possible Injury	2	1		1		4	18%	5
No Apparent Injury		2	5	5	2	14	64%	3
Total	3	6	5	6	2	22	100%	8

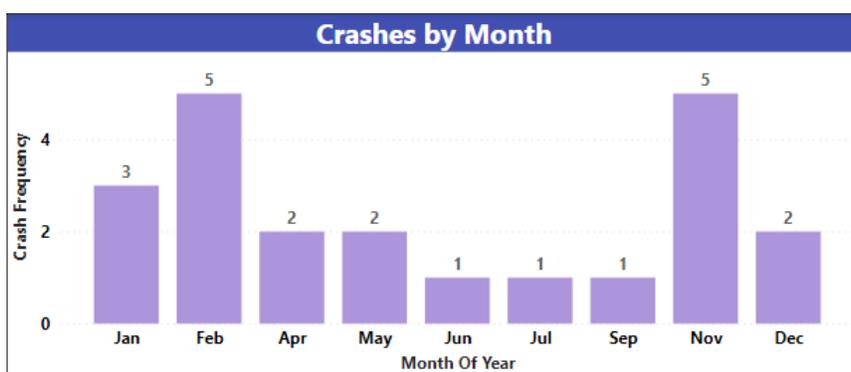


Figure 11. SR 532 MP 0.00-10.09 ODLT Crashes by Month (01/01/2016-12/31/2020)

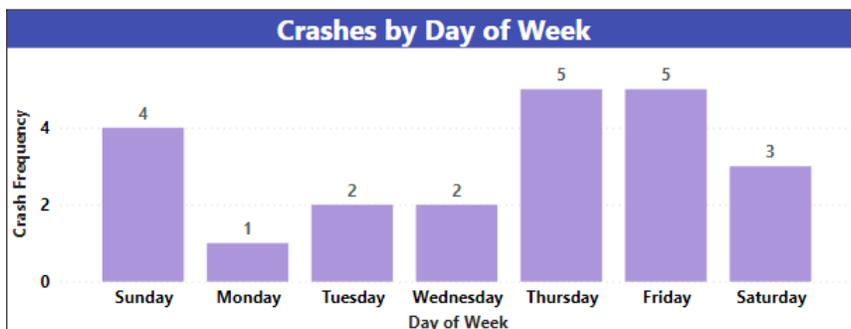


Figure 12. SR 532 MP 0.00-10.09 ODLT Crashes by Day of Week (01/01/2016-12/31/2020)

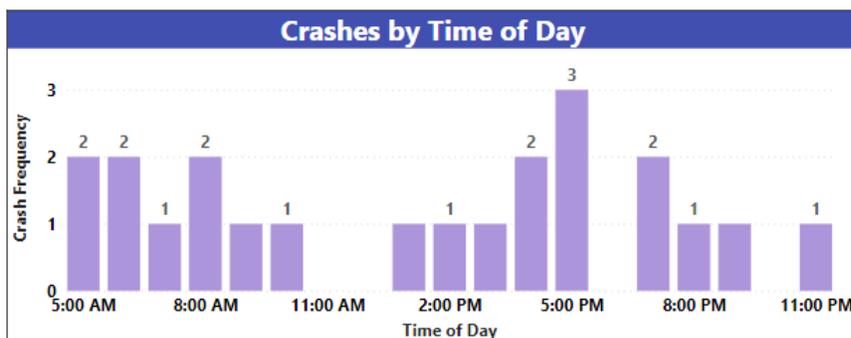


Figure 13. SR 532 MP 0.00-10.09 ODLT Crashes by Time of Day (01/01/2016-12/31/2020)

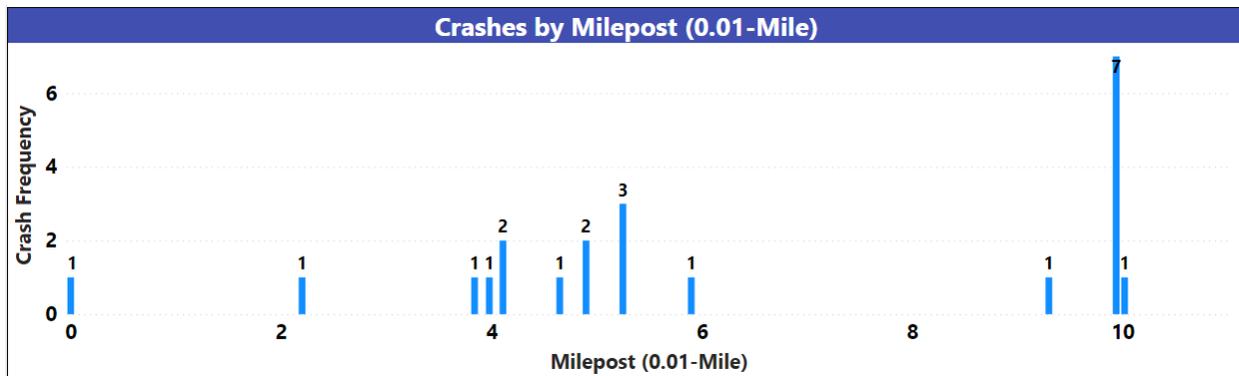


Figure 14. SR 532 MP 0.00-10.09 ODLT Crashes by Milepost (01/01/2016-12/31/2020)

Other ODLT crash characteristics are as follows:

- 20 at intersections, and 2 at driveways
- 13 (59%) in either dark or dusk
- 9 (41%) on either wet or icy surface
- Contributing cause: 12 DNG R/W, 3 inattention, and 1 ea. improper action, DUI, disregard control, & driver distraction
- V1 vs V2 Dir.:
 - o 8 EB vs WB
 - o 7 WB vs EB
 - o 2 NB vs SB
 - o 5 SB vs NB

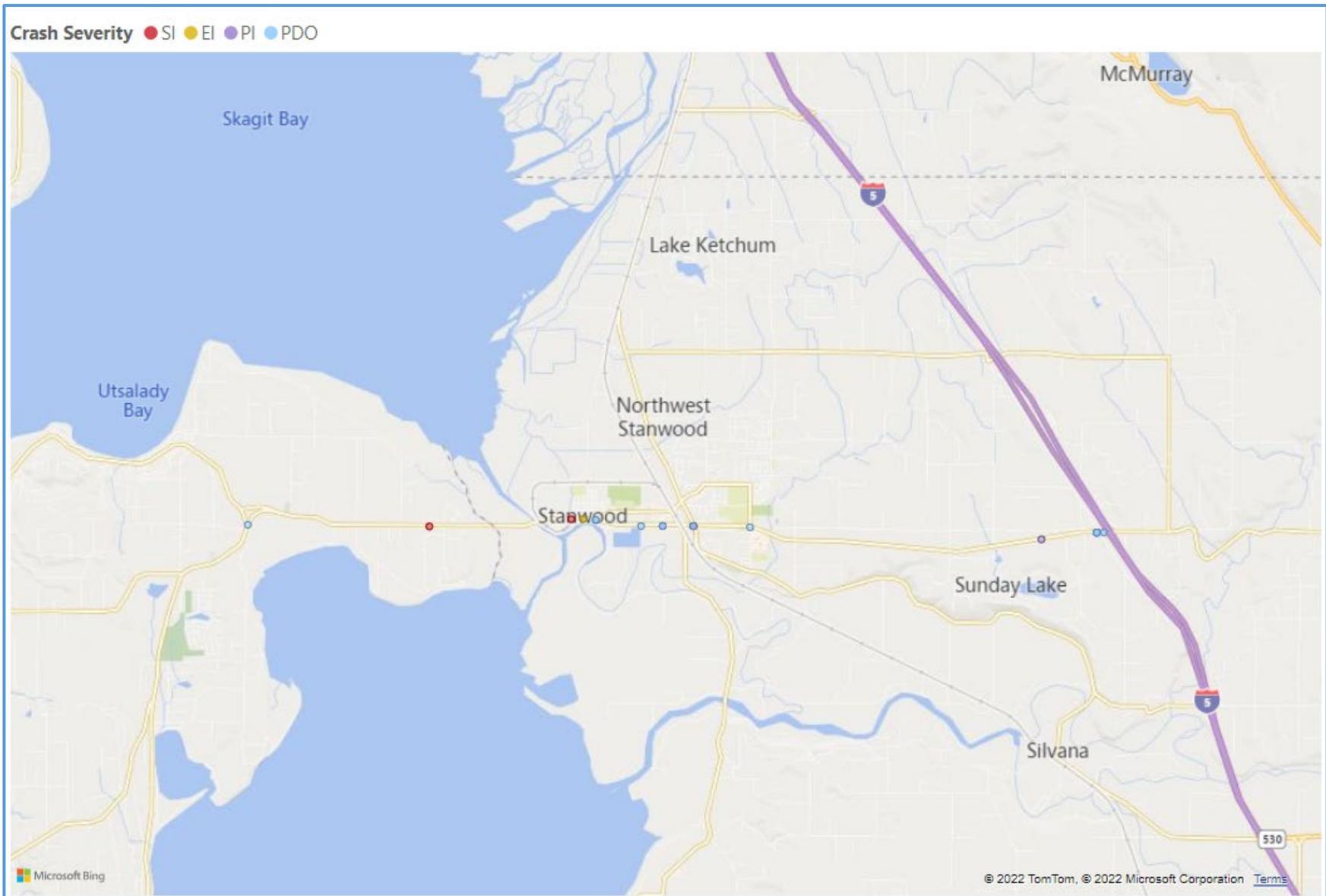


Figure 15. SR 532 MP 0.00-10.09 ODLT Crashes (01/01/2016-12/31/2020)

Sunrise Blvd I/S (MP 0.00)



Figure 16. SR 532 and Sunrise Blvd I/S at MP 0.00

Table 8. SR 532 and Sunrise Blvd I/S (MP 0.00-0.10) Crash Severities by Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Minor Injury					1	1	6%	
Possible Injury	1					1	6%	1
No Apparent Injury	1	6	3	3	3	16	89%	3
Total	2	6	3	3	4	18	100%	4

Table 9. SR 532 and Sunrise Blvd I/S (MP 0.00-0.10) Crash Types by Year

Crash Type	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Rear-end	2	5	3	1	3	14	78%	2
Entering at angle				1		1	6%	1
Sideswipe					1	1	6%	1
Opp Dir 1LT-1STR		1				1	6%	
Same Dir-Misc				1		1	6%	
Total	2	6	3	3	4	18	100%	4

Table 10. SR 532 and Sunrise Blvd I/S (MP 0.00-0.10) Crash Contributing Cause by Year

Contributing Circumstance	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Inattention	2	2	1			5	28%	
Following		2		1	2	5	28%	
Did Not Grant RoW				1		1	6%	1
Driver Distraction		1			1	2	11%	1
Other				1	1	2	11%	
Speed			1			1	6%	1
Disregard Control		1				1	6%	
None			1			1	6%	
Illness/meds						0	0%	1
Total	2	6	3	3	4	18	100%	4

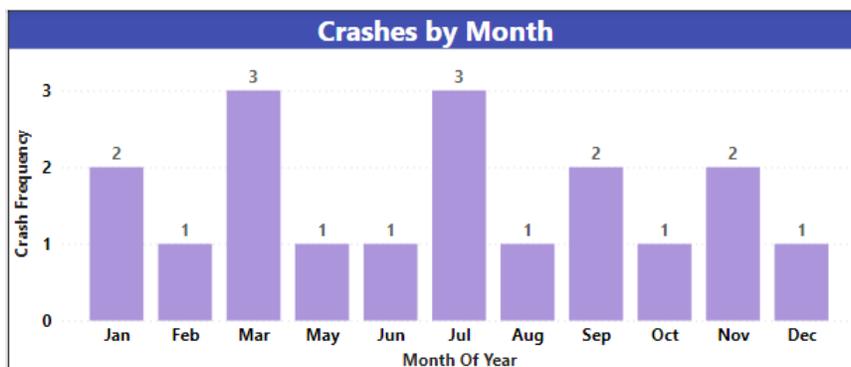


Figure 17. SR 532 and Sunrise Blvd I/S Crashes by Month (01/01/2016-12/31/2020)

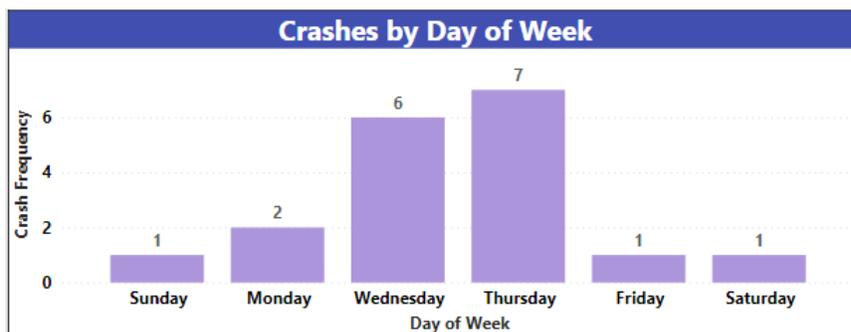


Figure 18. SR 532 and Sunrise Blvd I/S Crashes by Day of Week (01/01/2016-12/31/2020)

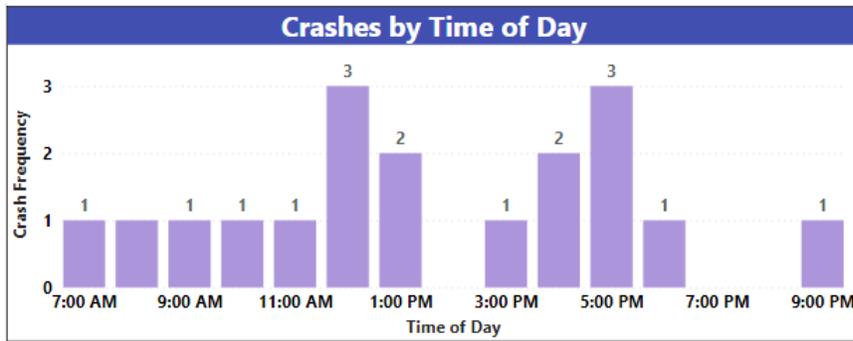


Figure 19. SR 532 and Sunrise Blvd I/S Crashes by Time of Day (01/01/2016-12/31/2020)

Other crash characteristics are as follows:

- 4 (22%) in either dark or dusk
- 5 (28%) on wet surface
- 14 RE crashes
 - o 1 EI and 1 PI
 - o 11 in either dark, dawn, or dusk time
 - o 11 on wet surface
 - o CC: 5 ea. following & inattention, and 1 ea. speed & driver distraction
 - o V1 & V2 Dir.:
 - 3 EB: 3 L1
 - 10 WB: 8 L1 & 2 L2
 - o All b/w 8 AM and 10 PM
 - 5 b/w 11 AM and 2 PM, and 6 b/w 3 PM and 7 PM

N Good Rd I/S (MP 1.85)



Figure 20. SR 532 and N Good Rd I/S at MP 1.85

Table 11. SR 532 and N Good Rd I/S (MP 1.75-1.95) Crash Severities by Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Minor Injury			1			1	8%	
Possible Injury	1		1	1		3	25%	
No Apparent Injury		2	2	3	1	8	67%	2
Total	1	2	4	4	1	12	100%	2

Table 12. SR 532 and N Good Rd I/S (MP 1.75-1.95) Crash Types by Year

Crash Type	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Entering at angle		2	4	2	1	9	75%	1
Rear-end	1			1		2	17%	
Sideswipe				1		1	8%	
Fixed object						0	0%	1
Total	1	2	4	4	1	12	100%	2

Table 13. SR 532 and N Good Rd I/S (MP 1.75-1.95) Crash Contributing Causes by Year

Contributing Circumstance	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Did Not Grant RoW		1	2	1	1	5	42%	
Inattention	1		1			2	17%	
None		1		1		2	17%	
Other			1	1		2	17%	
Following				1		1	8%	
Improper Action						0	0%	2
Total	1	2	4	4	1	12	100%	2

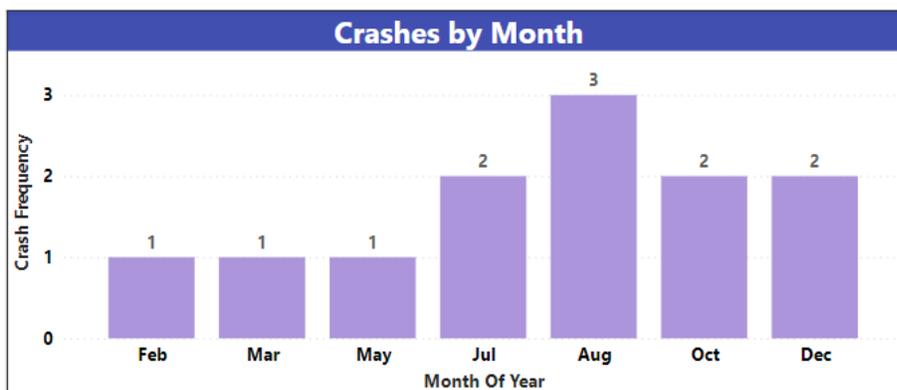


Figure 21. SR 532 and N Good Rd I/S Crashes by Month (01/01/2016-12/31/2020)

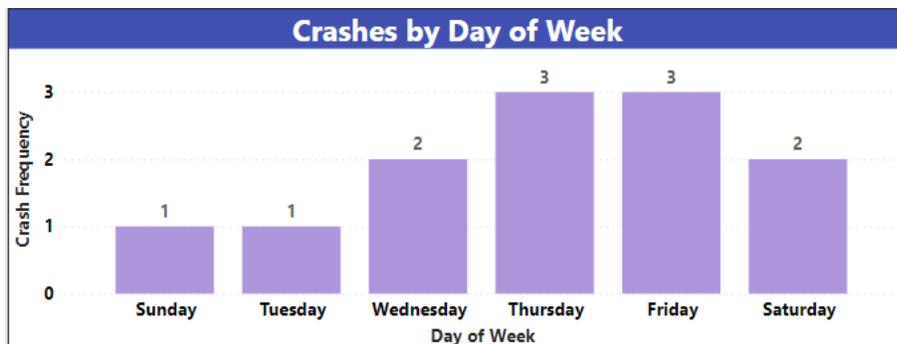


Figure 22. SR 532 and N Good Rd I/S Crashes by Day of Week (01/01/2016-12/31/2020)

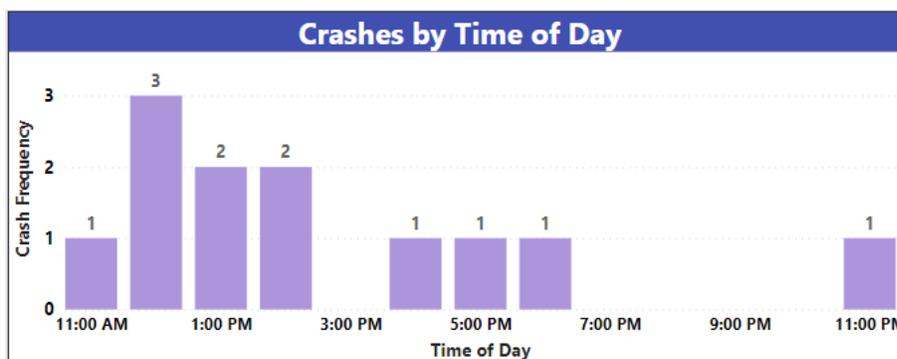


Figure 23. SR 532 and N Good Rd I/S Crashes by Time of Day (01/01/2016-12/31/2020)

Other crash characteristics are as follows:

- 2 (17%) in dark time
- 5 (42%) on wet surface
- 9 ACs
 - o 1 EI and 2 PI
 - o 1 in dark time
 - o 3 on wet surface
 - o CC: 6 DNG R/W, and 1 inattention
 - o V1 vs V2 Dir.:
 - 1 WB (making RT) vs SB (stopped)
 - 6 SB vs WB
 - 4 SB making LT vs WB moving straight
 - 1 SB making RT vs WB moving straight
 - 1 SB moving straight vs WB moving straight
 - 2 NB vs WB
 - o 6 b/w 11 AM and 3 PM, and 1 ea. @ 4:12 PM, @ 6:24 PM, & @ 11:09 PM

88th Ave NW I/S (MP 4.90)



Figure 24. SR 532 and 88th Ave NW I/S at MP 4.90

Table 14. SR 532 and 88th Ave NW I/S (MP 4.80-5.00) Crash Severities by Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Serious Injury					1	1	2%	
Suspected Minor Injury			2	1	1	4	10%	3
Possible Injury	2		3	2		7	17%	2
No Apparent Injury	13	4	5	8		30	71%	7
Total	15	4	10	11	2	42	100%	12

Table 15. SR 532 and 88th Ave NW I/S (MP 4.80-5.00) Crash Types by Year

Crash Type	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Rear-end	13	4	7	10		34	81%	9
Entering at angle	1		1		1	3	7%	
Opp Dir 1LT-1STR			1	1		2	5%	1
Fixed object					1	1	2%	
Opposite direction	1					1	2%	1
Parking			1			1	2%	
Sideswipe						0	0%	1
Total	15	4	10	11	2	42	100%	12

Table 16. SR 532 and 88th Ave NW I/S (MP 4.80-5.00) Crash Contributing Causes by Year

Contributing Circumstance	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Inattention	4	4	6	6		20	48%	
Following	3			3		6	14%	8
Driver Distraction	1		1	1	1	4	10%	3
Other	4					4	10%	
None	1		1			2	5%	
Did Not Grant RoW			1			1	2%	1
DUI	1					1	2%	
Defective Equip					1	1	2%	
Disregard Control			1			1	2%	
Improper Action				1		1	2%	
Speed	1					1	2%	
Total	15	4	10	11	2	42	100%	12

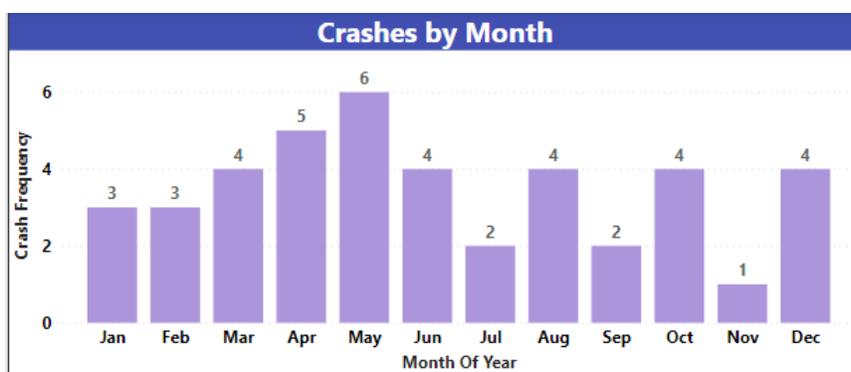


Figure 25. SR 532 and 88th Ave NW I/S Crashes by Month (01/01/2016-12/31/2020)

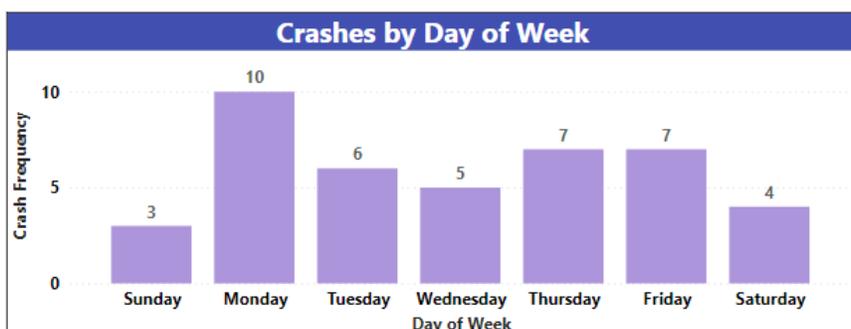


Figure 26. SR 532 and 88th Ave NW I/S Crashes by Day of Week (01/01/2016-12/31/2020)

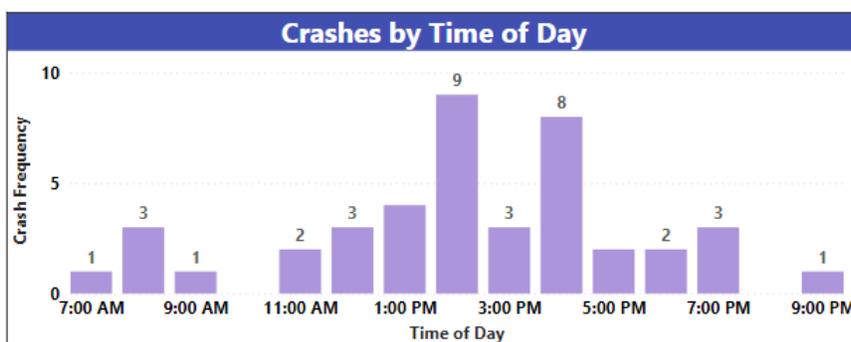


Figure 27. SR 532 and 88th Ave NW I/S Crashes by Time of Day (01/01/2016-12/31/2020)

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Other crash characteristics are as follows:

- 6 (14%) in either dark or dusk time
- 6 (14%) on wet surface
- 34 RE crashes
 - o 3 EI and 4 PI
 - o 3 in dark time
 - o 3 on wet surface
 - o CC: 20 inattention, 6 following, 3 driver distraction, and 1 speed
 - o V1 & V2 Dir.:
 - 11 EB: 9 L1, 2 LTL
 - 22 WB: All through lane
 - 1 SB
 - o All b/w 7 AM and 10 PM
 - 4 b/w 7 AM and 9 AM, 8 b/w 2 PM and 3 PM, and 7 b/w 4 PM and 5 PM
- 3 ACs
 - o 1 SI and 1 PI
 - o 1 in dark time
 - o 1 on wet surface
 - o CC: 1 ea. disregard control, driver distraction, and DUI
 - o V1 vs V2 Dir.:
 - 1 EB vs SB
 - 1 WB vs SB
 - 1 SB vs WB
 - o 1 ea. @ 4:23 PM, @ 5:15 PM, & @ 7:14 PM

Following Figure 28 shows the crash diagram at this intersection.

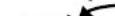
Under 23 U.S. Code § 148 and 23 U.S. Code § 409, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to 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.


Washington State Department of Transportation

Project: SR 532 Safety Study
Location: SR 532 MP 4.80-5.00
88th Ave NW I/S at MP 4.90

Collision Data Years: 2016 - 2020

Crash Type:

- Rear end (RE) 
- Entering at angle (AC) 
- Opp Dir 1LT-1STR (ODLT) 
- Opposite direction (OD) 
- Fixed object (FO) 
- Parking 

Crash Severity:

- K: Fatal
- A: Serious Injury
- B: Evident Injury
- C: Possible Injury
- O: PDO, Unknown

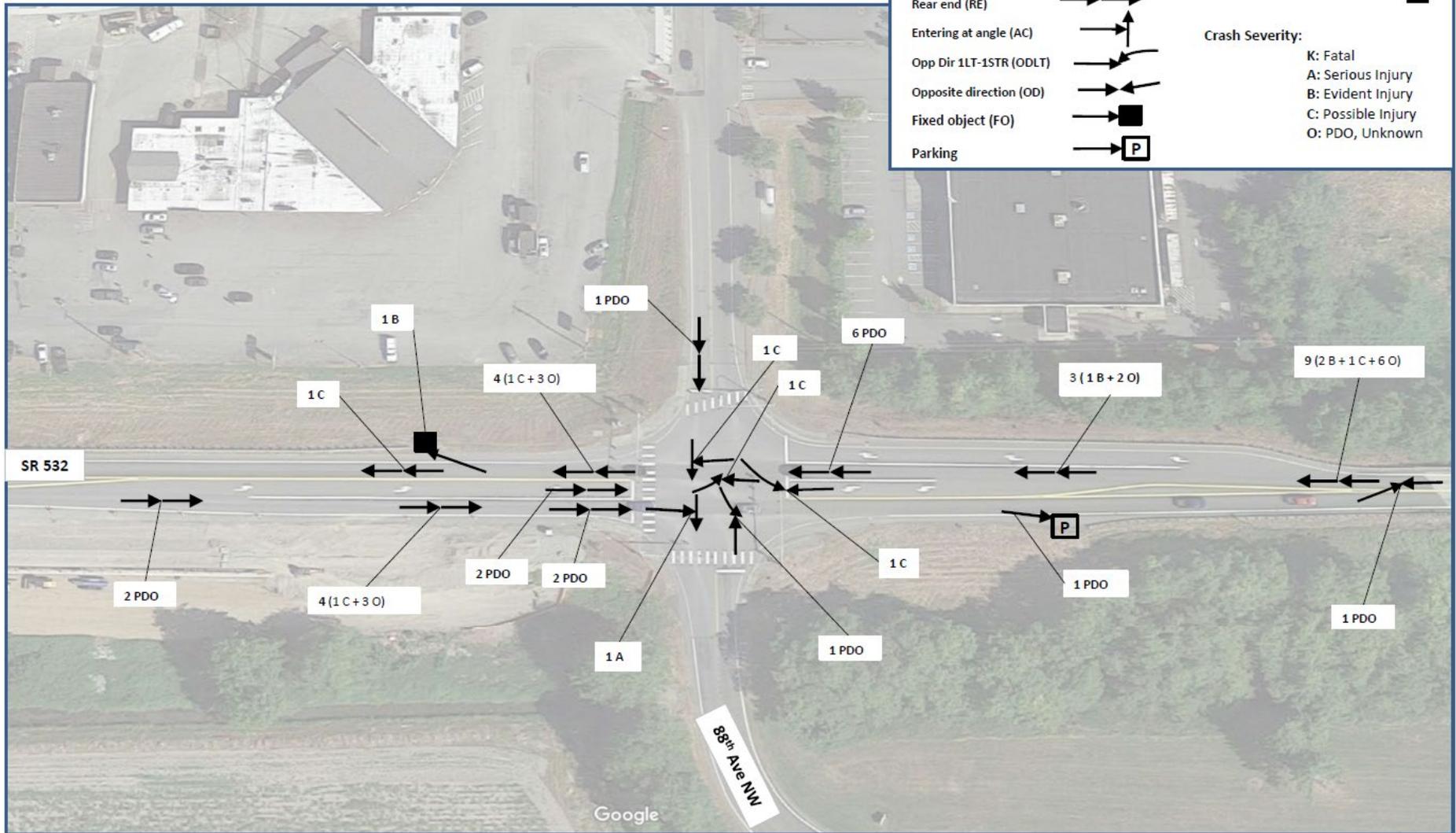


Figure 28. SR 532 and 88th Ave NW I/S Crash Diagram

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Pioneer Highway I/S (MP 5.25)



Figure 29. SR 532 and Pioneer Hwy I/S at MP 5.25

Table 17. SR 532 and Pioneer Hwy I/S (MP 5.15-5.35) Crash Severities by Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Dead at Scene		1				1	2%	
Suspected Serious Injury	1					1	2%	
Suspected Minor Injury		1	1		1	3	6%	
Possible Injury	2	2	4	5		13	24%	3
No Apparent Injury	7	10	7	2	10	36	67%	5
Total	10	14	12	7	11	54	100%	8

Table 18. SR 532 and Pioneer Hwy I/S (MP 5.15-5.35) Crash Types by Year

Crash Type	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Rear-end	8	12	9	4	8	41	76%	7
Opp Dir 1LT-1STR	2				1	3	6%	1
Same Dir-Misc		1	2			3	6%	
Sideswipe				1	1	2	4%	
Entering at angle				1		1	2%	
Opposite direction			1			1	2%	
Fixed object					1	1	2%	
Pedestrian		1				1	2%	
Animal				1		1	2%	
Total	10	14	12	7	11	54	100%	8

UNDER 23 U.S. CODE §148 AND 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 CRASH 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.

Table 19. SR 532 and Pioneer Hwy I/S (MP 5.15-5.35) Crash Contributing Cause by Year

Contributing Circumstance	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Inattention	2	7	5	2		16	30%	
Following	2	2	2	2	3	11	20%	4
Driver Distraction	3	1			6	10	19%	2
Other	1	2	2			5	9%	
None		1		2		3	6%	
Did Not Grant RoW	1				1	2	4%	1
Improper Action			1		1	2	4%	
Defective Equip	1		1			2	4%	
Sleep/fatigue				1		1	2%	1
Speed		1				1	2%	
Illness/meds			1			1	2%	
Total	10	14	12	7	11	54	100%	8

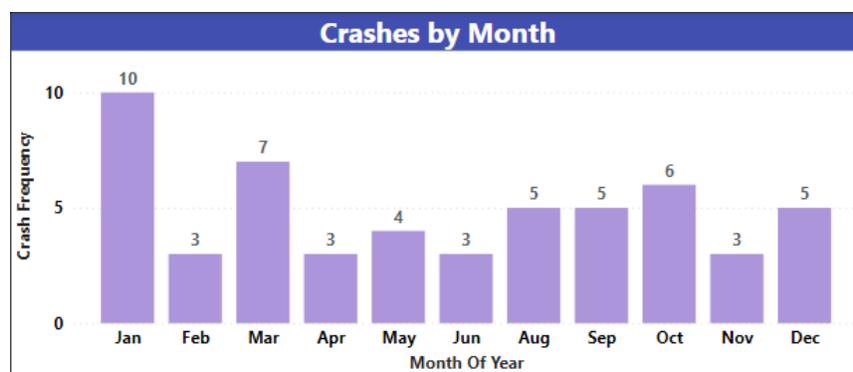


Figure 30. SR 532 and Pioneer Hwy I/S Crashes by Month (01/01/2016-12/31/2020)

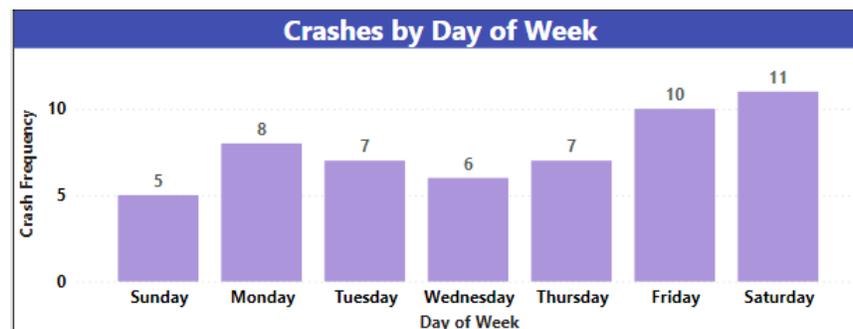


Figure 31. SR 532 and Pioneer Hwy I/S Crashes by Day of Week (01/01/2016-12/31/2020)

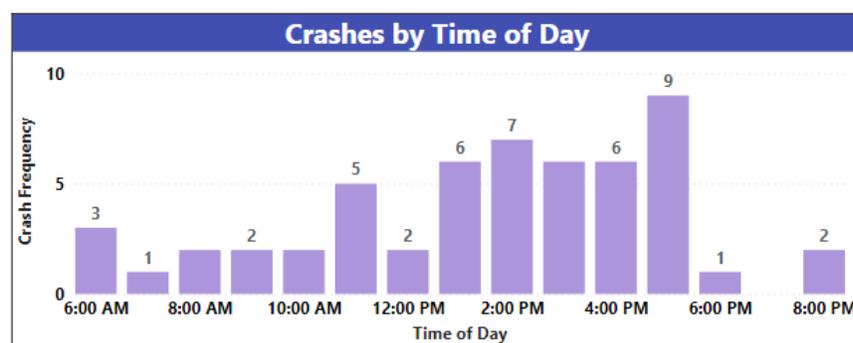


Figure 32. SR 532 and Pioneer Hwy I/S Crashes by Time of Day (01/01/2016-12/31/2020)

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Other crash characteristics are as follows:

- 10 (19%) in either dark, dawn, or dusk time
- 17 (31%) on either wet or icy surface
- 41 RE crashes
 - o 1 EI and 11 PI
 - o 6 in either dark, dawn, or dusk time
 - o 12 on wet surface
 - o CC: 14 inattention, 11 following, 9 driver distraction, 2 defective equip., and 1 ea. speed & sleep/fatigue
 - o V1 & V2 Dir.:
 - 9 EB: 6 L1, 3 L2
 - 32 WB: 23 L1 & 9 L2
 - 1 SB
 - o All b/w 6 AM and 9 PM
 - 3 b/w 6 AM and 9 AM, 36 b/w 10 AM and 6 PM (28 b/w 1 PM and 6 PM)
- 3 ODLT crashes
 - o 1 SI and 1 PI
 - o 6 in dark time
 - o 3 on either wet surface
 - o CC: 2 DNG R/W
 - o V1 vs V2 Dir.:
 - 2 NB (Making LT) vs SB
 - 1 SB (Making LT) vs NB
 - o 1 ea. @ 6:49 AM, @ 8:56 AM, & @ 8:27 PM
- 1 Ped Crash: Fatal, in dark-street lights on, on dry surface, @ 6:44 AM, CC-Veh: None

Following Figures 33 and 34 provide the crash diagram at this intersection.

Under 23 U.S. Code § 148 and 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 crash 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.

Washington State Department of Transportation Project: SR 532 Safety Study
 Location: SR 532 MP 5.15-5.35
 Collision Data Years: 2016 - 2020 Pioneer Hwy at MP 5.25

Crash Type:

- Rear-end (RE)
- Opp Dir 1LT-1STR (ODLT)
- Pedestrian (Ped)
- Opposite direction (OD)
- Fixed object (FO)

Crash Severity:

- K: Fatal
- A: Serious Injury
- B: Evident Injury
- C: Possible Injury
- O: PDO, Unknown

N

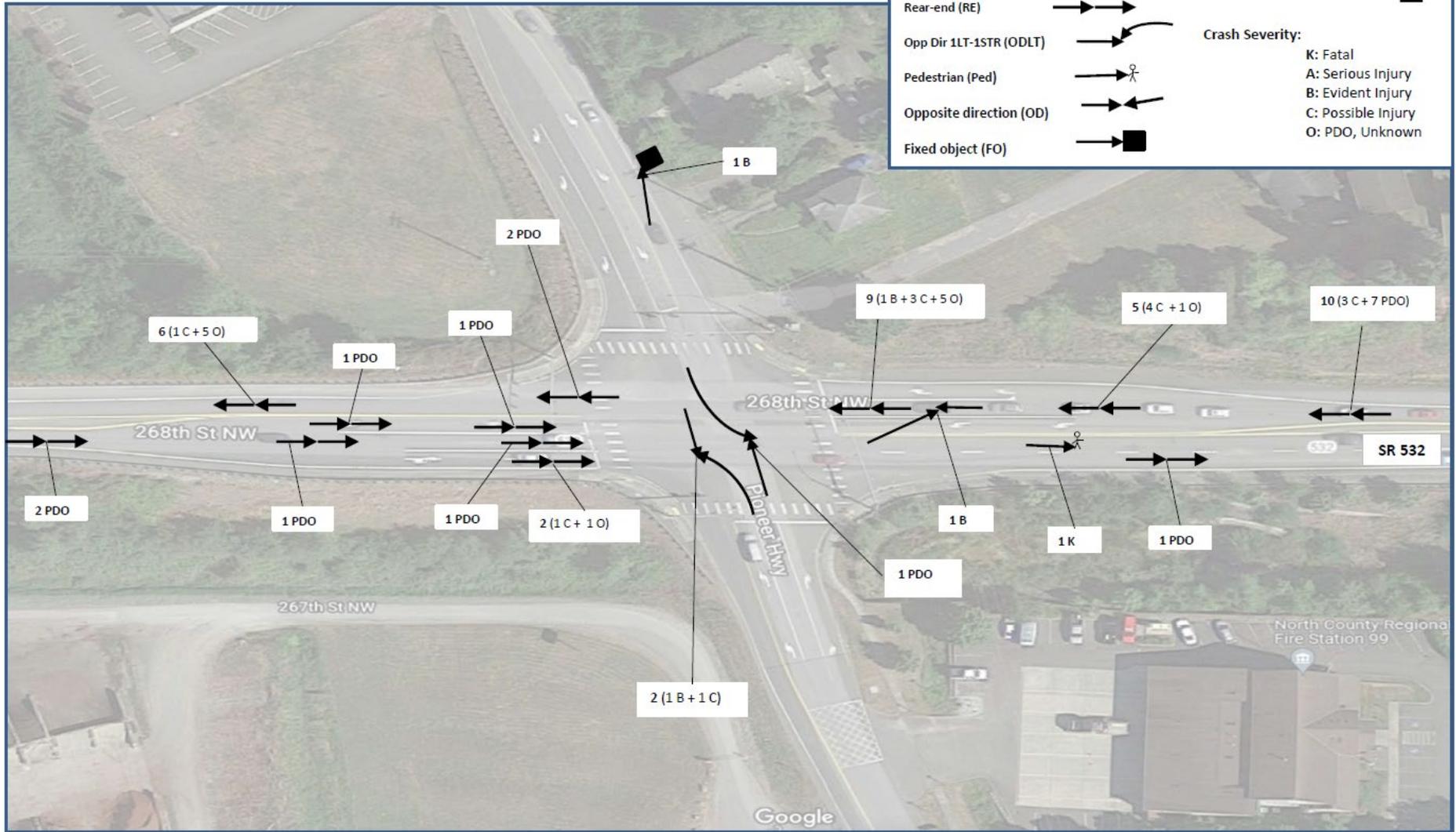
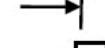
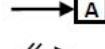
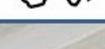


Figure 33. SR 532 and Pioneer Hwy I/S Crash Diagram Part 1

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Under 23 U.S. Code § 148 and 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 crash 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.

Washington State Department of Transportation Project: SR 532 Safety Study
 Location: SR 532 MP 5.15-5.35
 Collision Data Years: 2016 - 2020 Pioneer Hwy at MP 5.25

Crash Type:
 Sideswipe (SS) 
 Entering at angle (AC) 
 Animal 
 Backing 
 Out of control 

Crash Severity:
 K: Fatal
 A: Serious Injury
 B: Evident Injury
 C: Possible Injury
 O: PDO, Unknown

North Arrow 

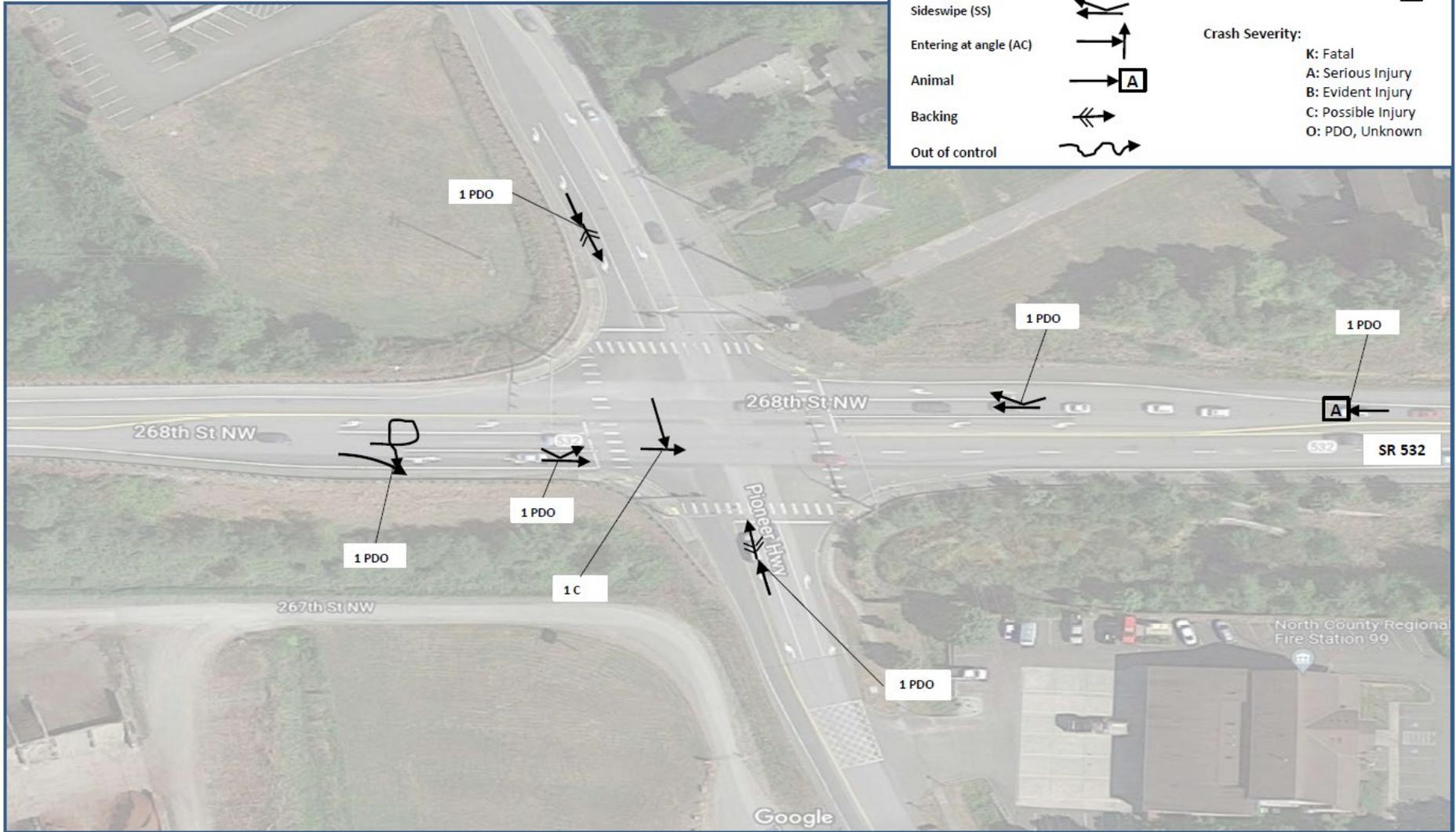


Figure 34. SR 532 and Pioneer Hwy I/S Crash Diagram Part 2

72nd Ave NW I/S (MP 5.90)

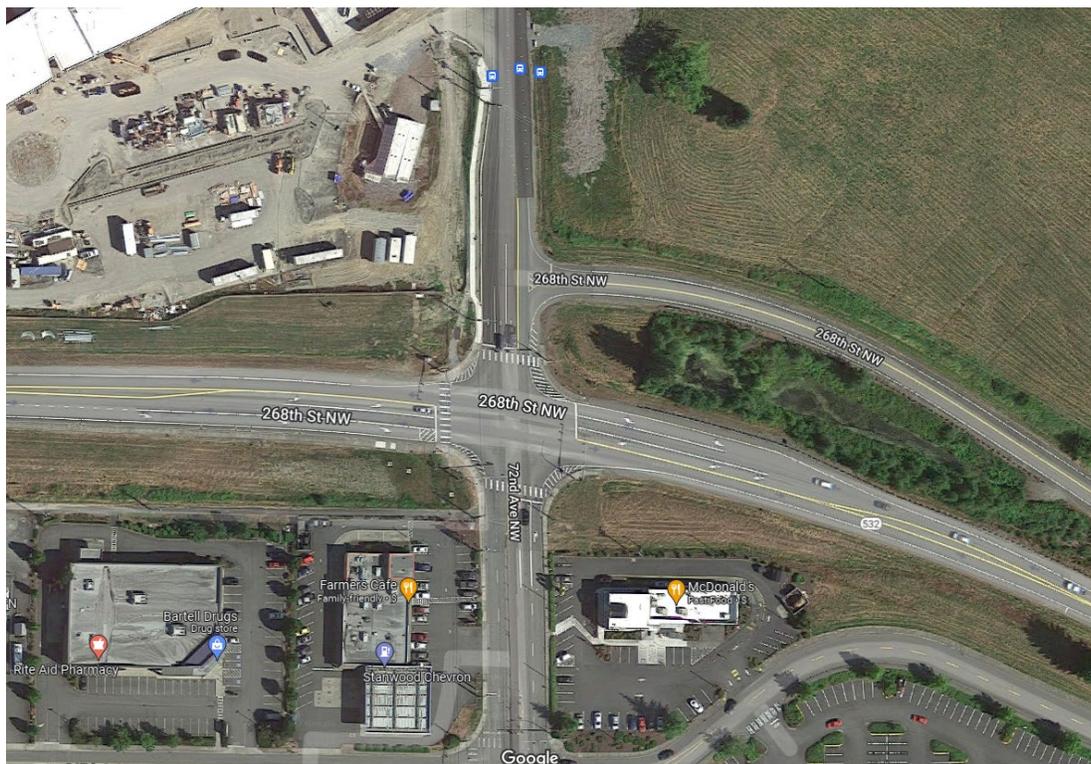


Figure 35. SR 532 and 72nd Ave NW I/S at MP 5.90

Table 20. SR 532 and 72nd Ave NW I/S (MP 5.80-6.00) Crash Severities by Year

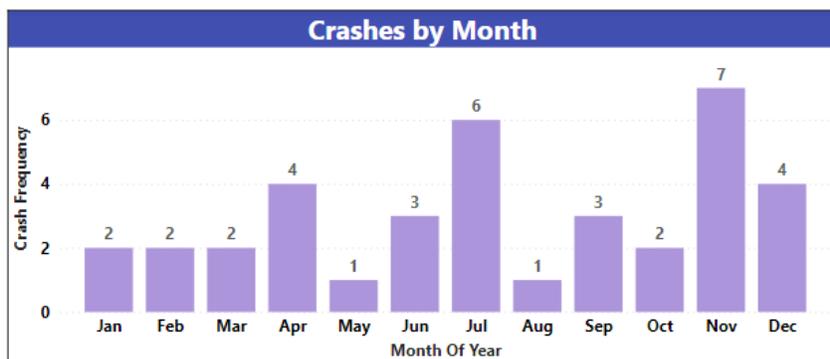
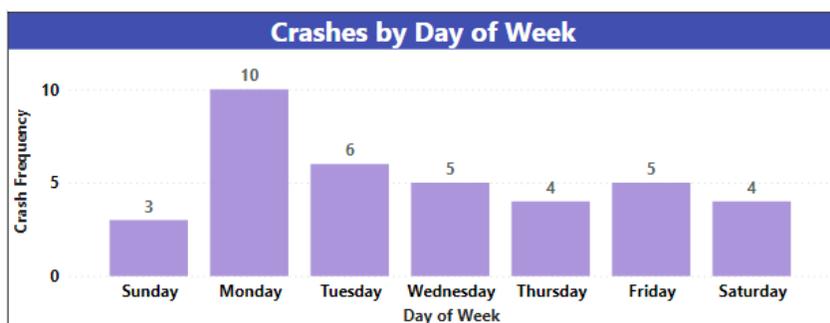
Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Minor Injury	1		1			2	5%	
Possible Injury	3	1	4	1	1	10	27%	1
No Apparent Injury	4	2	8	9	2	25	68%	7
Total	8	3	13	10	3	37	100%	8

Table 21. SR 532 and 72nd Ave NW I/S (MP 5.80-6.00) Crash Types by Year

Crash Type	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Rear-end	6	1	8	8	2	25	68%	6
Entering at angle	1	1	2	1	1	6	16%	1
Sideswipe		1	2			3	8%	1
Opp Dir 1LT-1STR				1		1	3%	
Opposite direction	1					1	3%	
Same Dir-Misc			1			1	3%	
Total	8	3	13	10	3	37	100%	8

Table 22. SR 532 and 72nd Ave NW I/S (MP 5.80-6.00) Crash Contributing Cause by Year

Contributing Circumstance	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Inattention	2		4	5		11	30%	
Did Not Grant RoW	1	1	1	1	1	5	14%	
Other		1	2	2		5	14%	
Following	1		1		2	4	11%	3
DUI		1	1	1		3	8%	1
Disregard Control	1			1		2	5%	
Improper Action			2			2	5%	1
Speed	1		1			2	5%	
Driver Distraction			1			1	3%	2
Sleep/fatigue	1					1	3%	
None	1					1	3%	
Defective Equip						0	0%	1
Total	8	3	13	10	3	37	100%	8

Figure 36. SR 532 and 72nd Ave NW I/S Crashes by Month (01/01/2016-12/31/2020)Figure 37. SR 532 and 72nd Ave NW I/S Crashes by Day of Week (01/01/2016-12/31/2020)

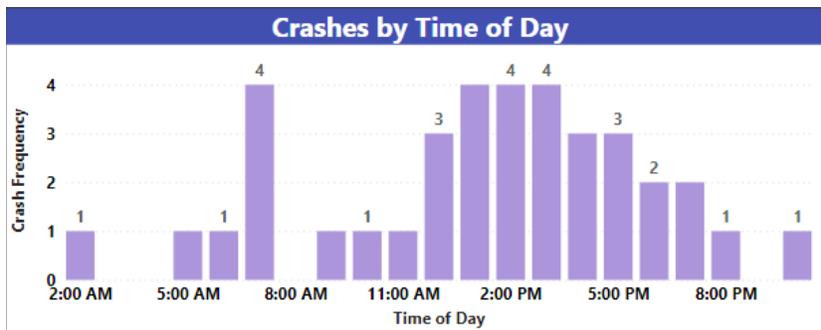


Figure 38. SR 532 and 72nd Ave NW I/S Crashes by Time of Day (01/01/2016-12/31/2020)

Other crash characteristics are as follows:

- 13 (35%) in either dark, dawn, or dusk time
- 7 (19%) on wet surface
- 25 RE crashes
 - o 2 EI and 6 PI
 - o 6 in dark time
 - o 3 on wet surface
 - o CC: 10 inattention, 4 following, 3 DUI, 2 speed, and 1 ea. disregard control & driver distraction
 - o V1 & V2 Dir.:
 - 15 EB: 6 L1, 9 L2
 - 7 WB: 2 L1, 3 L2, & 2 LTL
 - 2 NB & 1 SB
 - o All b/w 2 AM and 9 PM
 - 21 b/w 9 AM and 9 PM (8 b/w 2 PM and 4 PM)
- 6 ACs
 - o 2 PI
 - o 3 in dark time
 - o 1 on wet surface
 - o CC: 2 ea. DNG R/W & improper action, and 1 disregard control
 - o V1 vs V2 Dir.:
 - 1 EB vs SB
 - 1 WB vs SB & 1 WB vs NB
 - 2 NB vs EB
 - 1 SB vs WB
 - o 2 b/w 6 AM and 8 AM, 2 b/w 1 PM and 2 PM, and 1 ea. @ 7:46 PM & @ 10:15 PM

Following Figure 39 shows the crash diagram at this intersection.

Under 23 U.S. Code § 148 and 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 crash 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.


Washington State Department of Transportation

Project: SR 532 Safety Study
Location: SR 532 MP 5.80-6.00
72nd Ave NW I/S at MP 5.90

Collision Data Years: 2016 - 2020

Crash Type:

- Rear end (RE) 
- Entering at angle (AC) 
- Opp Dir 1LT-1STR (ODLT) 
- Opposite direction (OD) 
- Sideswipe (SS) 

Crash Severity:

- K: Fatal
- A: Serious Injury
- B: Evident Injury
- C: Possible Injury
- O: PDO, Unknown

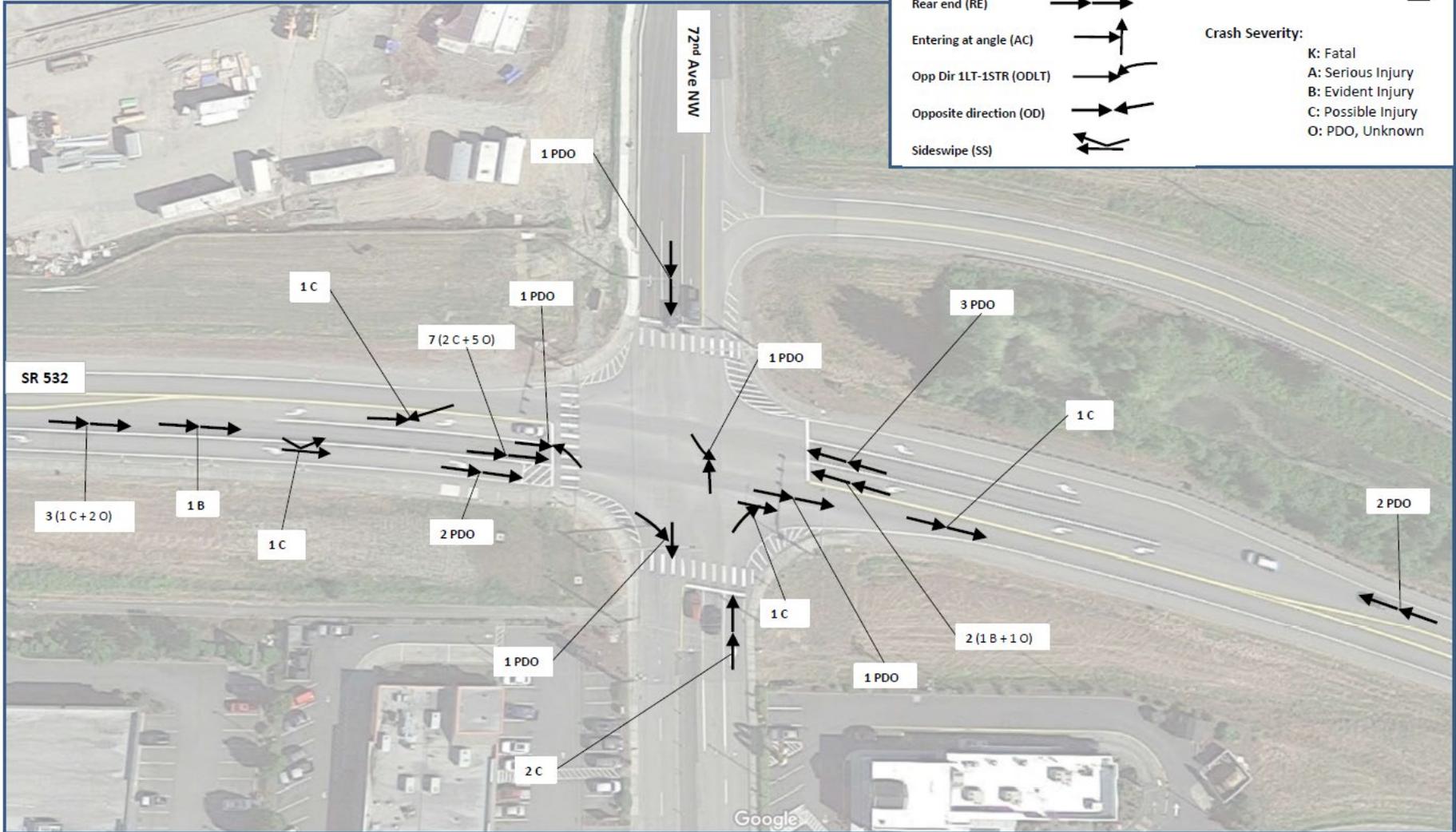


Figure 39. SR 532 and 72nd Ave NW I/S Crash Diagram

64th Ave NW I/S (MP 6.45)



Figure 40. SR 532 and 64th Ave NW I/S at MP 6.45

Table 23. SR 532 and 64th Ave NW I/S (MP 6.40-6.49) Crash Severities by Year

Crash Severity	2016				Total		2021
	2016	2017	2018	2019	Num.	Percentage	
Suspected Serious Injury				1	1	7%	
Suspected Minor Injury				2	2	14%	1
Possible Injury	3	1		2	6	43%	1
No Apparent Injury		3	1	1	5	36%	1
Total	3	4	1	6	14	100%	3

Table 24. SR 532 and 64th Ave NW I/S (MP 6.40-6.49) Crash Types by Year

Crash Type	2016				Total		2021
	2016	2017	2018	2019	Num.	Percentage	
Entering at angle	2	3		2	7	50%	2
Rear-end		1		2	3	21%	
Fixed object	1			1	2	14%	
Overtake				1	1	7%	
Animal			1		1	7%	
Opposite direction					0	0%	1
Total	3	4	1	6	14	100%	3

UNDER 23 U.S. CODE §148 AND 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 CRASH 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.

Table 25. SR 532 and 64th Ave NW I/S (MP 6.40-6.49) Crash Contributing Causes by Year

Contributing Circumstance	2016				Total		2021
	2016	2017	2018	2019	Num.	Percentage	
Speed				3	3	21%	1
Inattention	1			2	3	21%	
Did Not Grant RoW		2			2	14%	
DUI	1				1	7%	1
Improper Action		1			1	7%	1
Defective Equip				1	1	7%	
Driver Distraction		1			1	7%	
Over Center Line	1				1	7%	
None			1		1	7%	
Total	3	4	1	6	14	100%	3

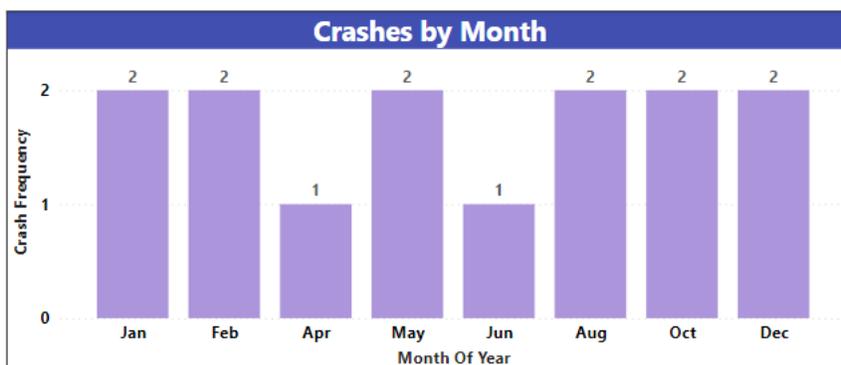


Figure 41. SR 532 and 64th Ave NW I/S Crashes by Month (01/01/2016-12/31/2020)

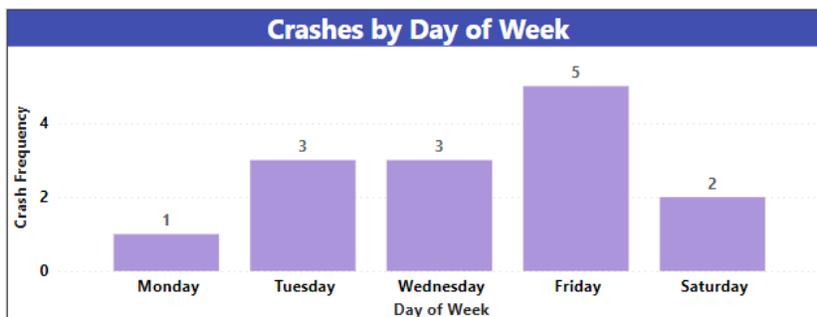


Figure 42. SR 532 and 64th Ave NW I/S Crashes by Day of Week (01/01/2016-12/31/2020)

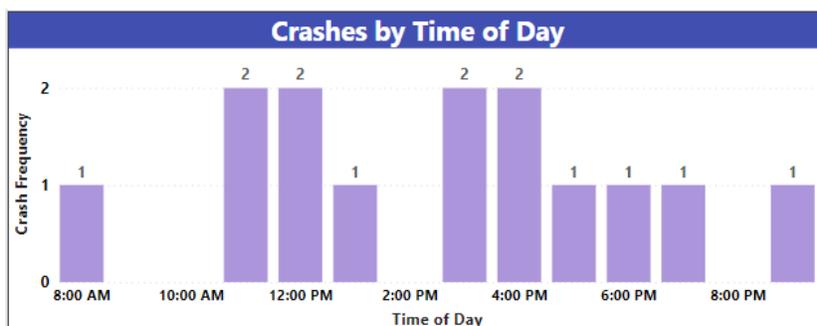


Figure 43. SR 532 and 64th Ave NW I/S Crashes by Time of Day (01/01/2016-12/31/2020)

Other crash characteristics are as follows:

- 2 (14%) in dark time
- 3 (21%) on wet surface
- 7 ACs
 - o 1 SI, 1 EI, and 3 PI
 - o 1 in dark time
 - o 1 on wet surface
 - o CC: 2 ea. DNG R/W & inattention, and 1 ea. improper action, over center line, and 1 speed
 - o V1 vs V2 Dir.:
 - 2 WB (making RT) vs SB
 - 2 NB vs EB & 1 NB vs WB
 - 2 SB vs WB
 - o All b/w 8 AM and 8 PM
 - 3 b/w 11 AM and 2 PM, and 2 b/w 4 PM and 6 PM

Old 99 North I/S (MP 9.94)



Figure 44. SR 532 and Old 99 North I/S at MP 9.94

Table 26. SR 532 and Old 99 North I/S (MP 9.84-9.96) Crash Severities by Year

Crash Severity	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Suspected Serious Injury		1				1	4%	
Possible Injury	2		1	2	1	6	23%	
No Apparent Injury	2	7	2	5	3	19	73%	3
Total	4	8	3	7	4	26	100%	3

Table 27. SR 532 and Old 99 North I/S (MP 9.84-9.96) Crash Types by Year

Crash Type	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Rear-end	2	3	3	3	3	14	54%	
Opp Dir 1LT-1STR	1	1		4	1	7	27%	2
Entering at angle		3				3	12%	
Same Dir-Misc	1					1	4%	1
Sideswipe		1				1	4%	
Total	4	8	3	7	4	26	100%	3

Table 28. SR 532 and Old 99 North I/S (MP 9.84-9.96) Crash Contributing Cause by Year

Contributing Circumstance	Year					Total		2021
	2016	2017	2018	2019	2020	Num.	Percentage	
Did Not Grant RoW	1	2		3		6	23%	1
Inattention	1	2	2	1		6	23%	
Following		2			2	4	15%	
Disregard Control		2				2	8%	
DUI				2		2	8%	
Other				1	1	2	8%	1
Speed	1		1			2	8%	
Driver Distraction					1	1	4%	
None	1					1	4%	
Improper Action						0	0%	1
Total	4	8	3	7	4	26	100%	3

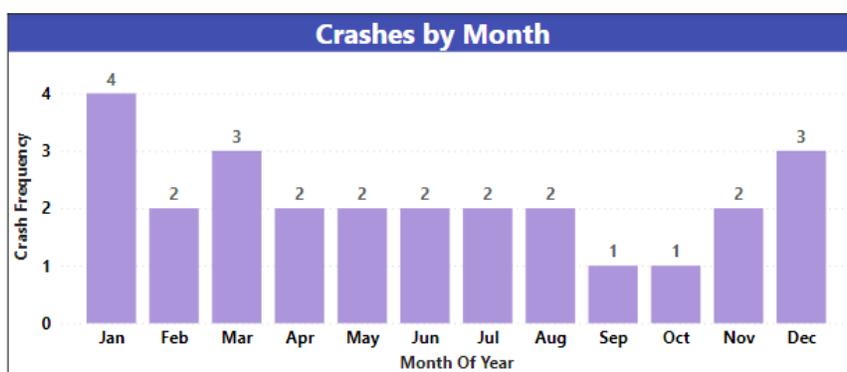


Figure 45. SR 532 and Old 99 North I/S Crashes by Month (01/01/2016-12/31/2020)

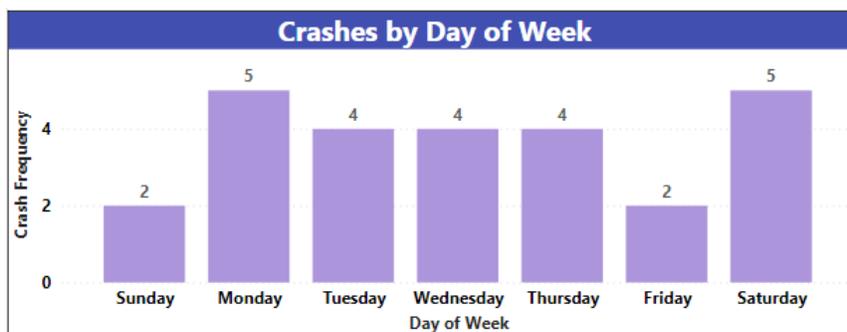


Figure 46. SR 532 and Old 99 North I/S Crashes by Day of Week (01/01/2016-12/31/2020)

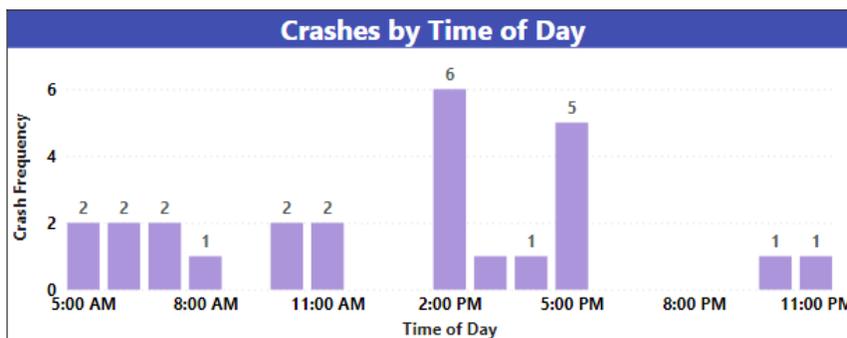


Figure 47. SR 532 and Old 99 North I/S Crashes by Time of Day (01/01/2016-12/31/2020)

Other crash characteristics are as follows:

- 10 (38%) in dark time
- 8 (31%) on wet surface
- 14 RE crashes
 - o 5 PI
 - o 2 in dark time
 - o 4 on wet surface
 - o CC: 5 inattention, 4 following, 3 DUI, 2 speed, and 1 ea. DUI & driver distraction
 - o V1 & V2 Dir.:
 - 12 EB: 11 L1, & 1 L2
 - 2 WB: 1 L1 & 1 L2
 - o All b/w 7 AM and 6 PM
 - 3 b/w 7 AM and 9 AM, 2 b/w 10 AM and 11 AM, 6 b/w 2 PM and 4 PM, and 5 b/w 5 PM and 6 PM
- 7 ODLT crashes
 - o 1 PI
 - o 5 in dark time
 - o 2 on wet surface
 - o CC: 5 DNG R/W, and 1 DUI
 - o V1 vs V2 Dir.:
 - 1 EB (Making LT) vs WB
 - 4 WB (Making LT) vs EB
 - 1 NB (Making LT) vs SB
 - 1 SB (Making RT) vs NB
 - o 5 b/w 5 AM and 7 AM, 1 ea. @ 10:08 AM, @ 8:56 AM, 2 b/w 4 PM and 6 PM, & 1 @ 11:14 PM

IHSDM Analysis

This section analyzes the entire study corridor according to the Highway Safety manual (HSM) prediction models. For this purpose, the Interactive Highway Safety Design Model (IHSDM) Crash Prediction Module was used to evaluate the safety of the corridor by evaluating safety performance of the individual segments and intersections along the study corridor.

Existing Condition Analysis

The SR 532 corridor from Sunrise Blvd I/S at MP 0.00 to the end of the highway at I-5 I/C at MP 10.09 is currently experiencing fewer crashes, on average, than a facility with similar characteristics. The corridor is expected to have 33.26 fatal and injuries crashes, on average, per year, whereas the predicted fatal and injury crashes for similar corridors is 39.55 crashes per year. This means that the study corridor is experiencing 6.29 fatal and injury crashes, on average, less than similar facilities in a year. Considering PDO crashes, it is expected that 68.28 PDO crashes occur on the study corridor per year, whereas similar facilities PDO crashes are predicted to be 74.75 crashes per year, which means that the study corridor is expected to have 6.47 PDO crashes, on average, less than the similar highways in a year. Table 29 below shows the IHSDM analysis results for the entire corridor.

Table 29. Predicted, Expected, and Excess Crash Frequencies for the Entire Corridor

	Predicted Crash Frequencies (Annual Average)			Expected Crash Frequencies (Annual Average)			Excess Crash Frequencies (Annual Average)		
	Fatal + All Injury	PDO	Total	Fatal + All Injury	PDO	Total	Fatal + All Injury	PDO	Total
The Corridor Crashes	39.55	74.75	114.30	33.26	68.28	101.54	-6.29	-6.47	-12.76

The functional class of SR 532 changes twice along the study corridor; therefore, there are two functions for analyzing the segments including rural and urban-suburban models. In addition to rural and urban areas, freeway ramp-terminal category was added to analyze the intersections on the corridor. Freeway ramp-terminal model was used to analyze the I-5 SB and SR 532 ramp-terminal. Tables 30-34 below show the analysis results for rural segments, rural intersections, freeway ramp-terminal, urban segments, urban intersections, respectively.

Considering the rural segments, in Table 30, there are some segments that are experiencing higher crashes than similar facilities and are highlighted in gray in Excess Crash Frequencies columns. These segments are:

- MP 0.82 to MP 0.87
- MP 2.90 to MP 3.05
- MP 4.25 to MP 5.25
- MP 9.79 to MP 10.09

In the urban area, according to Table 33, from six defined segments, only one segment MP 3.86 – 3.92 is experiencing higher crashes than similar facilities.

Several urban intersections according to the IHSDM analysis, as shown in Table 34, are experiencing higher crashes compared to similar intersections. These intersections are:

- 103rd Dr NW I/S at MP 3.92
- Camano St I/S at MP 4.11
- 98th Ave NW I/S at MP 4.25
- 88th Ave NW I/S at MP 4.90
- Pioneer Highway I/S at MP 5.25
- 72nd Ave NW I/S at MP 5.90

Looking at the excess crash frequencies, there are opportunities for improvement of a range of 0.04 to 5.71 total crashes per year for the aforementioned segments and intersections.

Table 30. Predicted, Expected, and Excess Crash Frequencies for the Rural Segments

Segment Number	Beg. MP	End MP	Predicted Crash Frequencies (Annual Average)						Expected Crash Frequencies (Annual Average)						Excess Crash Frequencies (Annual Average)					
			Fatal	SI	EI	PI	PDO	Total	Fatal	SI	EI	PI	PDO	Total	Fatal	SI	EI	PI	PDO	Total
1	0.00	0.35	0.03	0.11	0.22	0.30	1.40	2.061	0.01	0.05	0.10	0.14	0.64	0.943	-0.01	-0.06	-0.12	-0.16	-0.76	-1.11
2	0.35	0.68	0.03	0.12	0.24	0.33	1.53	2.248	0.02	0.10	0.19	0.26	1.23	1.806	-0.01	-0.02	-0.05	-0.06	-0.30	-0.44
3	0.68	0.82	0.02	0.08	0.16	0.23	1.06	1.555	0.01	0.03	0.06	0.09	0.40	0.589	-0.01	-0.05	-0.10	-0.14	-0.66	-0.96
4	0.82	0.87	0.01	0.02	0.05	0.07	0.31	0.452	0.01	0.03	0.05	0.07	0.33	0.491	0.00	0.00	0.00	0.01	0.03	0.04
5	0.87	1.00	0.03	0.11	0.22	0.30	1.40	2.060	0.01	0.05	0.09	0.13	0.60	0.881	-0.02	-0.06	-0.12	-0.17	-0.80	-1.17
6	1.00	1.13	0.01	0.06	0.11	0.16	0.74	1.093	0.01	0.03	0.06	0.08	0.38	0.562	-0.01	-0.03	-0.06	-0.08	-0.36	-0.53
7	1.13	1.34	0.03	0.12	0.23	0.31	1.47	2.170	0.01	0.06	0.12	0.16	0.75	1.100	-0.01	-0.06	-0.11	-0.16	-0.73	-1.07
8	1.34	1.73	0.04	0.18	0.35	0.49	2.29	3.374	0.01	0.06	0.11	0.15	0.70	1.031	-0.03	-0.13	-0.25	-0.34	-1.59	-2.33
9	1.73	1.85	0.01	0.04	0.07	0.10	0.46	0.677	0.00	0.01	0.01	0.02	0.07	0.106	-0.01	-0.03	-0.06	-0.08	-0.39	-0.57
10	1.85	2.38	0.04	0.16	0.31	0.43	2.03	2.989	0.03	0.14	0.27	0.37	1.74	2.559	-0.01	-0.02	-0.05	-0.06	-0.29	-0.43
11	2.38	2.60	0.02	0.07	0.14	0.19	0.90	1.326	0.02	0.07	0.13	0.18	0.85	1.252	0.00	0.00	-0.01	-0.01	-0.05	-0.07
12	2.60	2.90	0.03	0.11	0.21	0.28	1.33	1.964	0.02	0.10	0.19	0.26	1.20	1.767	0.00	-0.01	-0.02	-0.03	-0.13	-0.20
13	2.90	3.05	0.01	0.05	0.11	0.15	0.68	1.003	0.03	0.13	0.26	0.36	1.69	2.493	0.02	0.08	0.16	0.22	1.01	1.48
14	3.05	3.20	0.01	0.05	0.09	0.13	0.61	0.892	0.00	0.01	0.01	0.02	0.09	0.134	-0.01	-0.04	-0.08	-0.11	-0.51	-0.75
15	3.20	3.38	0.02	0.07	0.13	0.18	0.86	1.263	0.00	0.02	0.04	0.06	0.26	0.380	-0.01	-0.05	-0.09	-0.13	-0.60	-0.88
16	3.38	3.80	0.04	0.16	0.31	0.43	2.01	2.960	0.00	0.02	0.04	0.06	0.26	0.384	-0.03	-0.14	-0.27	-0.37	-1.75	-2.57
17	4.25	4.65	0.03	0.13	0.25	0.35	1.63	2.394	0.04	0.18	0.35	0.48	2.25	3.310	0.01	0.05	0.10	0.13	0.62	0.91
18	4.65	4.90	0.02	0.08	0.15	0.21	0.99	1.454	0.04	0.15	0.29	0.40	1.86	2.742	0.02	0.07	0.14	0.19	0.87	1.28
19	4.90	5.25	0.03	0.13	0.25	0.35	1.62	2.390	0.05	0.19	0.37	0.51	2.41	3.542	0.01	0.06	0.12	0.17	0.78	1.15
20	5.25	5.90	0.03	0.12	0.24	0.33	1.55	2.285	0.06	0.23	0.46	0.63	2.95	4.343	0.03	0.11	0.22	0.30	1.40	2.05
21	5.90	6.45	0.04	0.15	0.28	0.39	1.83	2.695	0.03	0.12	0.24	0.34	1.57	2.313	0.00	-0.02	-0.04	-0.06	-0.26	-0.38
22	6.45	6.85	0.02	0.09	0.18	0.25	1.17	1.720	0.01	0.05	0.10	0.14	0.63	0.935	-0.01	-0.04	-0.08	-0.11	-0.53	-0.78
23	6.85	7.21	0.02	0.09	0.17	0.24	1.11	1.632	0.01	0.06	0.12	0.16	0.76	1.112	-0.01	-0.03	-0.05	-0.08	-0.35	-0.52
24	7.21	7.52	0.02	0.07	0.13	0.18	0.82	1.210	0.01	0.02	0.05	0.07	0.31	0.452	-0.01	-0.04	-0.08	-0.11	-0.51	-0.75
25	7.52	8.22	0.03	0.14	0.27	0.37	1.75	2.578	0.01	0.06	0.12	0.17	0.78	1.151	-0.02	-0.08	-0.15	-0.21	-0.97	-1.42
26	8.22	8.74	0.03	0.13	0.26	0.36	1.68	2.478	0.02	0.10	0.20	0.27	1.27	1.869	-0.01	-0.03	-0.06	-0.09	-0.41	-0.61
27	8.74	9.00	0.02	0.07	0.14	0.20	0.91	1.347	0.01	0.05	0.09	0.12	0.57	0.846	-0.01	-0.03	-0.05	-0.07	-0.34	-0.50
28	9.00	9.30	0.02	0.08	0.15	0.20	0.95	1.403	0.01	0.05	0.09	0.13	0.59	0.865	-0.01	-0.03	-0.06	-0.08	-0.37	-0.54
29	9.30	9.69	0.02	0.10	0.19	0.26	1.20	1.773	0.02	0.07	0.14	0.19	0.91	1.340	-0.01	-0.02	-0.05	-0.06	-0.29	-0.43
30	9.69	9.79	0.01	0.03	0.05	0.07	0.33	0.490	0.00	0.02	0.03	0.04	0.20	0.291	0.00	-0.01	-0.02	-0.03	-0.14	-0.20
31	9.79	9.94	0.01	0.03	0.06	0.08	0.38	0.555	0.02	0.08	0.15	0.21	1.00	1.474	0.01	0.05	0.10	0.13	0.62	0.92
32	9.94	10.03	0.01	0.02	0.04	0.06	0.27	0.401	0.01	0.04	0.07	0.10	0.46	0.678	0.00	0.01	0.03	0.04	0.19	0.28
33	10.03	10.09	0.00	0.01	0.02	0.03	0.13	0.192	0.00	0.01	0.02	0.03	0.16	0.234	0.00	0.00	0.00	0.01	0.03	0.04
Rural Segments			0.72	2.97	5.78	7.99	37.40	55.08	0.57	2.37	4.62	6.38	29.86	43.98	-0.14	-0.60	-1.17	-1.61	-7.54	-11.11

UNDER 23 U.S. CODE §148 AND 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 CRASH 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.

Table 31. Predicted, Expected, and Excess Crash Frequencies for the Rural Intersections

I/S Type	I/S Name	MP	Predicted Crash Frequencies (Annual Average)						Expected Crash Frequencies (Annual Average)						Excess Crash Frequencies (Annual Average)					
			Fatal	SI	EI	PI	PDO	Total	Fatal	SI	EI	PI	PDO	Total	Fatal	SI	EI	PI	PDO	Total
4-leg Sig.	Sunrise Blvd	0.00	0.04	0.10	0.51	1.00	3.21	4.871	0.04	0.09	0.43	0.84	2.71	4.107	-0.01	-0.02	-0.08	-0.16	-0.50	-0.76
3-leg SC	Heichel Rd	0.82	0.02	0.04	0.16	0.18	0.55	0.946	0.01	0.02	0.08	0.09	0.28	0.479	-0.01	-0.02	-0.08	-0.09	-0.27	-0.47
3-leg SC	Fox Trot Way	1.10	0.01	0.03	0.11	0.12	0.37	0.634	0.01	0.02	0.07	0.08	0.24	0.412	0.00	-0.01	-0.04	-0.04	-0.13	-0.22
4-leg SC	Rekdal Rd	1.34	0.03	0.07	0.27	0.35	0.96	1.682	0.02	0.05	0.18	0.23	0.63	1.106	-0.01	-0.02	-0.09	-0.12	-0.33	-0.58
4-leg SC	Good Rd	1.85	0.06	0.15	0.57	0.73	1.99	3.497	0.05	0.11	0.41	0.53	1.44	2.536	-0.02	-0.04	-0.16	-0.20	-0.55	-0.96
4-leg SC	Smith Rd	2.38	0.04	0.10	0.39	0.50	1.37	2.415	0.02	0.04	0.15	0.19	0.51	0.902	-0.03	-0.07	-0.25	-0.31	-0.86	-1.51
4-leg SC	64th Ave NW	6.45	0.04	0.09	0.36	0.46	1.26	2.209	0.03	0.08	0.31	0.39	1.08	1.897	-0.01	-0.01	-0.05	-0.06	-0.18	-0.31
4-leg SC	36th Ave NW	8.22	0.02	0.05	0.17	0.22	0.60	1.052	0.02	0.04	0.17	0.21	0.58	1.026	0.00	0.00	0.00	-0.01	-0.01	-0.03
4-leg SC	28th Ave NW	8.74	0.04	0.09	0.32	0.41	1.13	1.978	0.02	0.06	0.22	0.28	0.76	1.337	-0.01	-0.03	-0.10	-0.13	-0.36	-0.64
3-leg SC	19th Ave NW	9.30	0.02	0.04	0.16	0.19	0.57	0.981	0.01	0.03	0.11	0.13	0.38	0.654	-0.01	-0.01	-0.05	-0.06	-0.19	-0.33
4-leg SC	12th Ave NW	9.79	0.04	0.08	0.32	0.41	1.12	1.970	0.02	0.06	0.22	0.28	0.76	1.335	-0.01	-0.03	-0.10	-0.13	-0.36	-0.64
4-leg Sig.	Old Hwy 99	9.94	0.04	0.09	0.47	0.91	2.94	4.460	0.04	0.09	0.44	0.85	2.74	4.155	0.00	-0.01	-0.03	-0.06	-0.20	-0.31
Rural Intersections			0.39	0.93	3.80	5.48	16.08	26.695	0.28	0.67	2.77	4.10	12.13	19.946	-0.11	-0.26	-1.04	-1.38	-3.95	-6.75

Table 32. Predicted, Expected, and Excess Crash Frequencies for the I-5/ SR 532 Interchange

I/C Type	I/C Name	MP	Predicted Crash Frequencies (Annual Average)			Expected Crash Frequencies (Annual Average)			Excess Crash Frequencies (Annual Average)					
			Fatal & All Injury		PDO	Total	Fatal & All Injury		PDO	Total	Fatal & All Injury		PDO	Total
SC	I-5 SB RT	10.03	1.32		2.94	4.253	0.43		2.07	2.499	-0.88		-0.87	-1.75

Table 33. Predicted, Expected, and Excess Crash Frequencies for the Urban Segments

Segment Number	Beg. MP	End MP	Predicted Crash Frequencies (Annual Average)			Expected Crash Frequencies (Annual Average)			Excess Crash Frequencies (Annual Average)		
			Fatal & All Injury	PDO	Total	Fatal & All Injury	PDO	Total	Fatal & All Injury	PDO	Total
1	3.80	3.86	0.29	0.69	0.982	0.28	0.63	0.913	-0.01	-0.06	-0.07
2	3.86	3.92	0.31	0.75	1.061	0.33	1.27	1.609	0.02	0.52	0.55
3	3.92	3.97	0.18	0.40	0.576	0.13	0.33	0.453	-0.05	-0.07	-0.12
4	3.97	4.03	0.34	0.80	1.145	0.21	0.46	0.662	-0.13	-0.35	-0.48
5	4.03	4.11	0.38	0.92	1.303	0.22	0.54	0.761	-0.16	-0.38	-0.54
6	4.11	4.25	0.55	1.39	1.943	0.48	0.53	1.010	-0.07	-0.86	-0.93
Urban Segments			2.05	4.96	7.01	1.64	3.76	5.41	-0.41	-1.19	-1.60

Table 34. Predicted, Expected, and Excess Crash Frequencies for the Urban Intersections

I/C Type	I/C Name	MP	Predicted Crash Frequencies (Annual Average)			Expected Crash Frequencies (Annual Average)			Excess Crash Frequencies (Annual Average)		
			Fatal & All Injury	PDO	Total	Fatal & All Injury	PDO	Total	Fatal & All Injury	PDO	Total
4-leg SC	104th Dr NW	3.86	0.65	0.95	1.600	0.36	1.10	1.462	-0.30	0.16	-0.14
4-leg SC	103rd Dr NW	3.92	0.44	0.67	1.113	0.51	0.75	1.266	0.07	0.08	0.15
3-leg SC	102nd Dr NW	3.97	0.37	0.45	0.825	0.32	0.33	0.647	-0.06	-0.12	-0.18
4-leg Sig.	102nd Ave NW	4.03	1.22	2.29	3.507	0.78	1.03	1.807	-0.44	-1.26	-1.70
3-leg SC	Camano St	4.11	0.57	0.98	1.543	0.58	1.03	1.615	0.02	0.05	0.07
4-leg SC	98th Ave NW	4.25	0.57	0.84	1.403	1.05	1.89	2.942	0.48	1.06	1.54
3-leg Sig.	92nd Ave NW	4.65	0.85	1.65	2.493	0.55	1.14	1.694	-0.29	-0.50	-0.80
4-leg Sig.	88th Ave NW	4.90	1.27	2.32	3.588	1.38	3.20	4.576	0.11	0.88	0.99
4-leg Sig.	Pioneer Hwy	5.25	0.78	1.51	2.297	1.27	3.83	5.108	0.49	2.32	2.81
4-leg Sig.	72nd Ave NW	5.90	1.16	1.73	2.886	2.44	6.15	8.593	1.28	4.42	5.71
Urban Intersections			5.19	9.02	14.21	7.28	17.25	24.53	2.09	8.23	10.32