

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

| | | | |
|----------------------|---|---|---------------------------------|
| AGENDA TITLE: | 2012 Annual Traffic Report | | |
| DEPARTMENT: | Public Works | | |
| PRESENTED BY: | Mark Relph, Public Works Director Rich Meredith, City Traffic Engineer | | |
| ACTION: | <input type="checkbox"/> Ordinance | <input type="checkbox"/> Resolution | <input type="checkbox"/> Motion |
| | <input checked="" type="checkbox"/> Discussion | <input type="checkbox"/> Public Hearing | |

PROBLEM/ISSUE STATEMENT:

Tonight staff will present the 2012 Annual Traffic Report (Attachment A). The purpose of this report and presentation is threefold:

1. To share with Council the data and methodology that the Public Works and Police Departments use to identify and develop action plans to address the higher accident locations within the City. The methodology is based on the "Three E's" - Enforcement, Engineering improvements and Education of the public.
2. To update the Council on the effectiveness of past improvements and efforts to lower the accident rates of key intersections and corridors.
3. To identify potential future capital projects to address high collision intersections or road segments. The Council is asked to consider these projects for further consideration as part of the annual Capital Improvement Program (CIP) process, including consideration as part of the Transportation Improvement Plan (TIP). Inclusion of the projects within the TIP would establish priorities for the pursuit of grant funding in future years.

RESOURCE/FINANCIAL IMPACT:

There are no additional financial or resource impacts at this time. The Public Works and Police Departments will continue to use existing staff for engineering and enforcement needs. Based on the data in the report, projects identified as a priority would be considered as part of the 2014-2019 CIP process, and would be presented to the Council on an individual basis. Enforcement emphasis and small works projects would be handled using existing resources. The 2013 budget includes \$110,000 for these types of projects.

RECOMMENDATION

The Council is not required to take any action tonight. This item is intended to be an informational briefing.

Approved By: City Manager ***JU*** City Attorney ***IS***

INTRODUCTION

One of the City's key missions is to provide for the safe and efficient movement of people, goods, and services. Factors affecting users of the public roadways are constantly changing as Shoreline and the surrounding region grows and develops.

Factors affecting the City's mission are also constantly changing. These factors include such things as roadway traffic volumes, speeding, pavement conditions, new development or redevelopment, roadway construction, and vegetation.

Attachment A is a copy of the 2012 Annual Traffic Report. This report summarizes some of the traffic data collected by staff on a regular basis. This data is used for many purposes, including selecting and prioritizing large and small improvement projects, managing police resources, transportation planning, managing construction activities, grant funding opportunities, and addressing safety issues throughout the City.

Public Works traffic engineers and the Police traffic division staff meet quarterly to review recent accident trends and work together to identify appropriate strategies to address and mitigate safety issues. Strategies can involve increased enforcement, an engineering solution, or education and encouragement. The City also coordinates regularly with the Shoreline School District to update safe walking route maps to and from schools, targeted traffic enforcement of school zones, and grant funding for safety improvements.

DISCUSSION

Part I – Annual Traffic Report

There are three collision reduction tools used to improve safety, commonly known as the three E's. These factors are engineering, enforcement, and education:

1. *Engineering* solutions include installing traffic control devices (signs, striping, curbing and median islands, etc), roadway maintenance (paving, vegetation trimming, etc), and CIP projects (roadway widening, traffic signals, etc).
2. *Enforcement* includes special emphasis patrols targeting specific violations, such as speeding, failure to yield to pedestrians, and disobeying traffic control devices.
3. *Education* efforts include Neighborhood Service Centers the Neighborhood Traffic Action Planning (NTAP) program, the Neighborhood Traffic Safety Program (NTSP), radar speed displays, and the traffic services page on the City's website: www.shorelinewa.gov/traffic.

The City of Shoreline has a database of police reported collisions occurring in the City. The database is made up of information from the Shoreline Police and Washington State Department of Transportation (WSDOT). Due to delays in data entry by WSDOT, only about five months of data in 2012 is available. Therefore, only the three year period of 2009, 2010, and 2011 was used for most of the statistical analysis in the report.

The City of Shoreline collision database classifies crashes as either an intersection or a mid-block segment accident. Intersection crashes are those that actually happen within the intersection, including the crosswalks whether they are marked or not. All other accidents on city streets are assigned to mid-block segments. Some agencies, such as WSDOT classify intersection accidents as those that occur within a one-block radius around the intersection. While their method results in additional crashes in the intersection report, this is mostly useful only when analyzing a corridor such a state route. This method is limited when applied to an urban area such as Shoreline.

In urban areas with intersections every block, there is a need to track collisions on all public roadways in the street grid network. Rear-end collisions related to an intersection are now assigned to adjacent segments. However, Public Works assigns special coding in the database to these reports so they can be included with intersection accidents if needed for a special study or grant application.

Corridor reports include intersections and mid-block collisions on the route only. The corridor segments can be grouped in many different ways, and some judgment is required in determining the limits of the corridor report. Staff selected some significant routes for the purposes of this report to illustrate how choosing different intersections as corridor study limits influences the data results. This is helpful in determining a specific subsection of a corridor that may need additional attention due to collision rates or occurrences.

Public Works regularly conducts a minimum of 250 traffic studies annually. These studies help identify pavement design and signal timing needs. A traffic study includes collecting vehicle volumes, speeds, and vehicle classification information. Using vehicle volume and speed data, staff was able to develop maps showing the current 85th percentile speeds and traffic volumes on Shoreline roadways. The 85th percentile speed is a measure commonly used in engineering studies, where 85% of the vehicles measured are traveling at this speed or slower. Matching the speed information with the posted speed limits, staff created another map showing the difference between the actual speeds and posted speeds. This is another tool the Police Department uses to target resources to address traffic issues within the City. These traffic maps are included as Attachment B.

High Collision Analysis Methodology

Staff utilizes two key reports: 1) high collision intersections, and 2) high collision mid-block segments. These reports list the locations within the City with the highest number of reported accidents in descending order. The list does not consider the volume of traffic. By adding traffic volume data to these reports, staff is able to calculate collision rates which can then be utilized to identify locations with the highest collision rates. Injury rates are calculated by adding up the total number of reported injuries, and combining them with the traffic volume data.

There is no industry standard as to what collision rate measure is considered “high.” Nationally, locations with five (5) or more correctable accidents in a 12 month period may be considered for some additional traffic control devices, such as Stop signs and

traffic signals. Staff calculates collision rates at intersections and along corridors as a way to help prioritize and target workload and funds.

Police and Public Works staff worked together to review at least the top ten locations on these four reports. The intent of focusing on the top ten locations is to maximize the City's limited resources and ultimately address the most problematic locations, and thereby lowering the overall accident rate within the City. Locations are evaluated for correctable accident patterns. Using the three E's, recommendations were developed to try to address any identified collision patterns. Staff also considered some near term and longer-term strategies to address the identified issues.

Lastly, staff combined the intersection and mid-block data and created a report of significant corridors within the City. By including volume data, and using some judgment in determining specific corridor limits, staff developed a report listing corridors by collision rate. These high collision lists with evaluations are shown in Attachment A.

We tend to monitor intersections where there may have been some collisions, but do not have any pattern that would suggest a solution. Also, other locations may have some accidents one year, and none the next. In the absence of a discernible pattern, sometimes we have to take a longer look at the intersection to determine if there is anything we can do to improve the situation.

As for the roadway segments with "monitor situation", the collisions in these segments are primarily rear-end accidents due to vehicles stopped for a traffic signal. There isn't much that can be done to correct this type of pattern, so we tend to monitor to roadway to make sure there are no other contributing circumstances.

Highlights of the Traffic Report

The "Top Ten" **intersection** accident locations by rate¹ and a recommendation to address the issues are (from Attachment A):

| | Location | Crash Rate | Injury Rate | Recommendation |
|---|-----------------------------|------------|-------------|---|
| 1 | Linden Ave N & N 182nd St | 1.66 | 0.47 | Review visibility for obstructions and increase enforcement of obeying traffic control devices |
| 2 | Linden Ave N & N 165th St | 1.22 | 0.98 | Review visibility for obstructions, increase enforcement of traffic control devices, and continue to monitor situation. |
| 3 | Ashworth Ave N & N 192nd St | 1.16 | 0.00 | Review visibility for obstructions, increase enforcement of obeying traffic control devices, and continue to monitor situation. |
| 4 | 25th Ave NE & NE 150th St | 0.99 | 0.17 | Review visibility for obstructions and continue to monitor situation. |

¹ Reported collisions from 1/1/2009 to 12/31/2011, with crash and injury rates per million vehicle miles per year.

| | Location | Crash Rate | Injury Rate | Recommendation |
|----|---------------------------------|------------|-------------|---|
| 5 | 3rd Ave NW & NW Richmond Bch Rd | 0.78 | 0.29 | Possible retiming of the traffic signal in near term. Pursue grant funding in long term for a widening project |
| 6 | Linden Ave N & N 175th St | 0.69 | 0.30 | Monitor Situation. Roadway restriped to three lanes in 2011 to improve safety |
| 7 | Dayton Ave N & N 160th St | 0.55 | 0.00 | Review traffic signal operation for possible signal timing improvements |
| 8 | 5th Ave NE & NE 155th St | 0.42 | 0.12 | Review traffic signal operation for possible signal timing improvements |
| 9 | 5th Ave NE & NE 175th St | 0.36 | 0.20 | Review traffic signal operation for signal timing improvements |
| 10 | Meridian Ave N & N 155th St | 0.34 | 0.24 | Restripe Meridian Ave N to provide left turn pockets. Review traffic signal operation for signal timing improvements. |

The “Top Ten” **mid-block** accident locations by rate² and a recommendation to address the issues are (from Attachment A):

| | Location | Crash Rate | Injury Rate | Recommendation |
|----|--|------------|-------------|---|
| 1 | N 175th St from Linden Ave N to Aurora Ave N | 21.35 | 3.05 | Monitor situation |
| 2 | NW Innis Arden Way from 6th Ave NW to 9th Ave NW | 13.00 | 4.87 | Increase enforcement of speed limit and monitor situation |
| 3 | N 205th St from Whitman Ave N to Aurora Ave N | 12.63 | 4.59 | Monitor situation |
| 4 | N 155th St from Aurora Ave N to Midvale Ave N | 10.95 | 2.19 | Review for possible placement of curbing to restrict left-turns |
| 5 | Greenwood Ave N from N 145th St to Westminster Way N | 9.01 | 1.50 | Monitor situation |
| 6 | Aurora Ave N from N 199th St to N 200th St | 7.99 | 4.23 | Monitor situation |
| 7 | Aurora Ave N from N 184th St to N 185th St | 7.43 | 0.62 | Monitor situation |
| 8 | N 160th St from Linden Ave N to Aurora Ave N | 7.05 | 1.76 | Monitor situation |
| 9 | N 185th St from Burke Ave N to Meridian Ave N | 6.86 | 2.29 | Monitor situation |
| 10 | 15th Ave NE from NE 172nd St to NE 175th St | 6.76 | 1.93 | Review for possible placement of curbing to restrict left-turns |

² Reported collisions from 1/1/2009 to 12/31/2011, with crash and injury rates per million vehicle miles per year.

Other observations from the report:

- Rear-end and right-angle types of crashes make up approximately 58% of all reported collisions over the past three years.
- The top two contributing circumstances are “exceeding a reasonably safe speed” and “did not grant right-of-way.”
- Approximately two-thirds of reported crashes occur during daylight on dry pavement.
- Three intersections were identified as needing further review along with some preliminary recommendations.
 - 3rd Avenue NW and NW Richmond Beach Road. A possible near-term engineering solution is to change the operation of the traffic signal to provide some protected left turns. However, this will create more overall vehicle delay and congestion, so a longer-term improvement would involve widening NW Richmond Beach Road to provide room for left turn lanes between 2nd Avenue NW and 8th Avenue NW.
 - 5th Avenue NE and NE 175th Street. The near-term recommendation is more enforcement emphasis on obeying traffic control devices and speed limits. A possible engineering solution is to review the traffic signal operation for possible protected left-turn phases.
 - Meridian Avenue N and N 155th Street. A possible engineering solution is to stripe new left pockets at the existing traffic signal.
 -
- The prevalent collision pattern on mid-block segments is rear-end accidents, which are difficult to correct. However, there were a couple of areas identified with collision types other than rear-end crashes that were reviewed for improvements.
- N 155th Street between Aurora Avenue N and Midvale Avenue N. There are a number of crashes related to the driveway on the south side of N 155th Street. A possible engineering treatment would be to eliminate left turns through use of curbing in the centerline of N 155th Street.

Part II - Effectiveness of Past Improvements

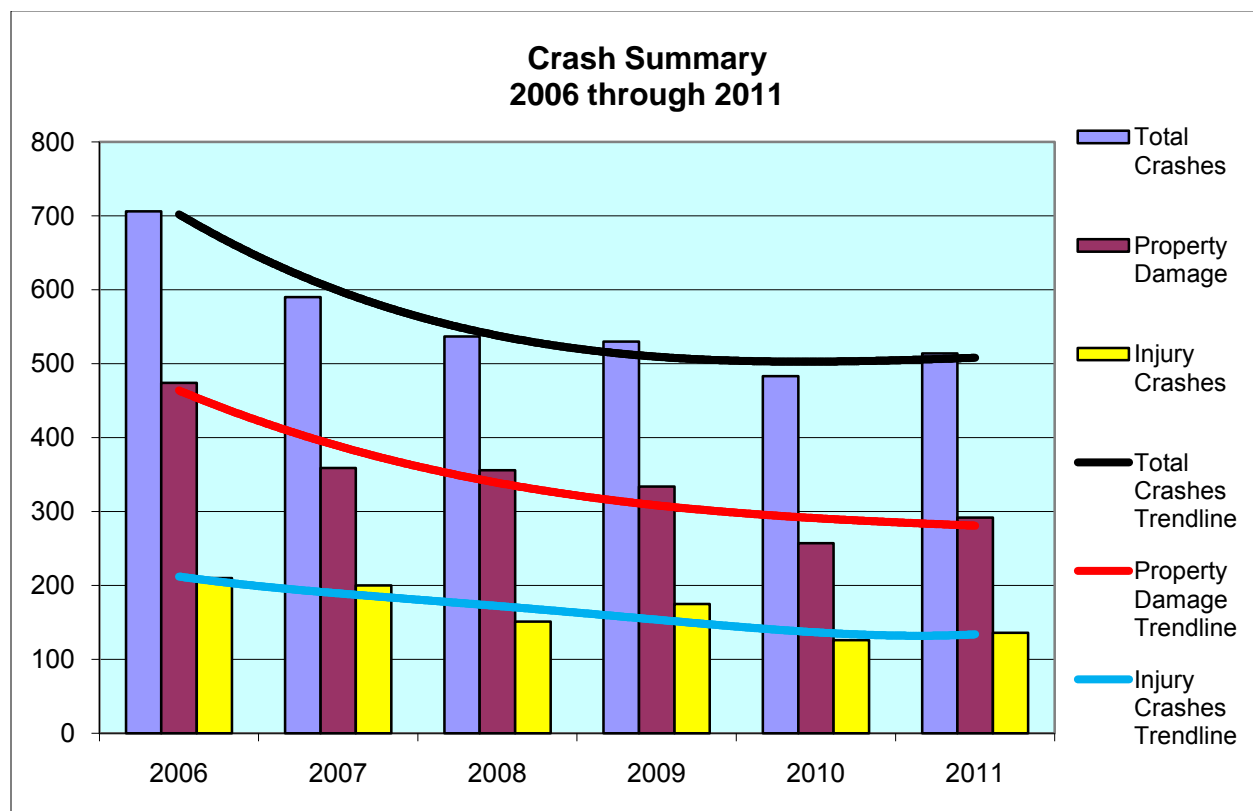
One example of the potential effectiveness of CIP improvements is the reconstruction project of Aurora Avenue N between N 145th Street and N 165th Street. One of the key objectives of this project was to improve safety. Construction of the first phase began in August 2005. Since its completion in early 2007, the number of reported collisions between N 145th Street and N 165th Street has dropped by over 50%, and the number of injuries dropped by 43%. Reviewing the mid-block section of Aurora Ave N between N 152nd Street and N 155th Street, the number of crashes and the number of injuries both decreased by almost 75%. Staff is anticipating having similar results with the completion of phases 2 and 3A of Aurora Ave N from N 165th Street to N 192nd Street, which were completed by summer of 2012.

Another engineering solution to a safety problem was the restriping of 15th Avenue NE between NE 150th Street and NE 175th Street, which was completed in December, 2003. While the total number of accidents remained constant, the number of injuries dropped by over 30%, demonstrating that the severity of the collisions in the corridor has been reduced.

The Annual Traffic Report (Attachment A) presents a historical summary of accident trends from 2006 through 2011. The general trend indicates the City has had a significant impact on reducing the number and severity of accidents:

Accident Summary

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total Crashes | 706 | 590 | 537 | 530 | 483 | 514 |
| Property Damage | 474 | 359 | 356 | 334 | 257 | 292 |
| Injury Crashes | 210 | 200 | 151 | 175 | 126 | 136 |
| Number of Injuries | 272 | 275 | 197 | 213 | 146 | 163 |
| Fatal Crashes | 2 | 0 | 0 | 1 | 2 | 1 |



Part III - Future Projects for CIP and TIP Consideration

- 3rd Avenue NW and NW Richmond Beach Road – This intersection continues as a high accident rate intersection, due primarily to the lack of left-turn pockets and

signalization on NW Richmond Beach Rd. Widening to include left-turn pockets and left-turn signalization is the minimal future project. Consideration should be given to expanding the project to the west, creating a full five-lane section (with median and focused turn pockets) between 8th Avenue NW and 3rd Avenue NW which is the commercial area in Richmond Beach. Scoping for the project should also consider the operations and safety at the 5-legged Richmond Beach/8th/Innis Arden intersection. If the Point Wells development project moves forward, this section of NW Richmond Beach Rd should be included in the corridor study with potential developer mitigation. This project is already in the Transportation Improvement Plan (TIP).

- N 175th Street between Aurora Avenue N and 15th Avenue NE – This corridor includes several high accident intersections (Ronald Pl N, Midvale Ave N, Meridian Ave N, I-5 Ramps, 10th Ave NE, 15th Ave NE). The Transportation Master Plan reviewed this corridor and identified the need for future capacity and safety projects. The corridor also has an incomplete sidewalk system, and has been identified by bicycle users as a potential bicycle route. The collision issues at Midvale Ave N and Ronald Place N intersections should show significant improvement with the completion of the Aurora project. Several projects on this route are already included the TIP.
- Aurora Avenue N between N 192nd Street and N 205th Street –This project should address a significant majority of the safety issues. This project will begin construction in 2013.

RECOMMENDATION

The Council is not required to take any action tonight. This item is intended to be an informational briefing.

ATTACHMENTS

Attachment A – 2012 Annual Traffic Report
Attachment B – Traffic Maps



City of Shoreline
Annual Traffic Report
2012

City of Shoreline Traffic Report - 2012

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City of Shoreline Traffic Report - 2012

Introduction

The City of Shoreline Traffic Services section collects crash data for use in analyzing and evaluating traffic operations in our city. Such data is useful in many ways, including helping the Shoreline Police Department target areas for enforcement, to prioritize City resources, and to apply for grants to help finance capital improvement projects. This report contains some of that data, as well as general trend information about collisions and traffic volumes in Shoreline.

For additional information specific to locations within Shoreline, please contact our traffic services section or visit the Traffic Services web page at www.cityofshoreline.com

When reviewing crash statistics, the numbers by themselves mean very little. But when they lead to decisive action, they can help beat the odds of injury, death, and property damage. Take, for example, the Aurora Ave N project. The ability to document the safety potential of the proposal allowed the City to obtain grants to help fund the project, and City leadership supported directing resources for implementation. One measure of success can be seen in that the number of reported crashes has dropped over 75% since the roadway changes between N 145th St and N 165th St were put into effect,

Improvements to roadway safety do not fall entirely on local agencies. Individuals can also contribute to highway safety efforts. Nowhere is that more apparent than in the decision to wear safety belts. A properly worn safety belt can make the difference between brain damage and sore ribs. More and more people are wearing safety belts, but it is critical that the belts be worn properly if they are to be effective in reducing the severity of injuries in a crash, even in a vehicle equipped with air bags.

Data Sources

This report primarily summarizes data collected by the City of Shoreline Traffic Services for the years 2009-2011. The information collected for this report includes only the collisions reported on city streets that are investigated by police officers. Excluded from the report are crashes on private property, on N/NE 145th St, phone reports, non-police investigated incidents, collisions under the threshold of \$700, and other non-crash vehicle incident reports.

Collision statistics analyzed in this report only include police traffic collision reports from the Shoreline police department merged with data from the Washington State DOT data office, which includes crashes investigated by other agencies. No citizen reports are included as WSDOT no longer provides this data to local jurisdictions.

The data contained in this report are based on reportable crashes only, as defined below.

Definitions of various crash categories are also provided.

Definitions

- | | |
|----------------------|---|
| Reportable Collision | A crash which involves death, injury, or property damage in excess of \$700.00 to the property of any one person. |
| All Collisions | The total number of reportable motor vehicle crashes including fatal, injury or property damage. |

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| | |
|---|--|
| Fatal Collision | Motor vehicle crash that results in fatal injuries to one or more persons. |
| Injury Collision | Motor vehicle crash that results in injuries, other than fatal, to one or more persons. |
| Property Damage Only Collision (PDO) | Motor vehicle crash in which there is no injury to any person, but only damage to a motor vehicle, or to other property, including injury to domestic animals. |

As of January 1, 2000, the accident-reporting threshold for property damage accidents shall be seven hundred dollars (WAC 446-85-010)

Part I – Overview

Collision Summary

The City of Shoreline Traffic Services recorded 514 crashes reported within the city of Shoreline for the year 2011.

| <u>Year</u> | <u>2006</u> | <u>2007</u> | <u>2008</u> | <u>2009</u> | <u>2010</u> | <u>2011</u> |
|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total Crashes | 706 | 590 | 537 | 530 | 483 | 514 |
| Property Damage | 474 | 359 | 356 | 334 | 257 | 292 |
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| Fatal Crashes | 2 | 0 | 0 | 1 | 2 | 1 |

Societal Costs/Economic Impacts

Traffic crashes have considerable impact not only on the people directly involved in the crash but also on the community as a whole. Below are the National Safety Council's most recent (year 2010) analysis of motor vehicle crash costs in the United States. The information provided includes estimates for the average economic cost per death (not each fatal crash), per injury (not each injury crash), and property damage crash. The economic cost estimates are a measure of the productivity lost and expenses incurred because of the crashes; they do not reflect what society is willing to pay to prevent a statistical fatality or injury.

☐ Motor vehicle crashes per each death, injury and property damage:

| | |
|---|-------------|
| <input type="checkbox"/> Death | \$1,410,000 |
| <input type="checkbox"/> Disabling Injury | \$70,200 |
| <input type="checkbox"/> Incapacitating Injury | \$69,200 |
| <input type="checkbox"/> Non-Incapacitating evident Injury | \$22,300 |
| <input type="checkbox"/> Possible Injury. | \$12,600 |
| <input type="checkbox"/> Property Damage Crash (including non-disabling injuries) | \$8,900 |

☐ The following comprehensive cost estimates include not only the economic cost components, but also a measure of the value of lost quality of life associated with the deaths and injuries; that is, what society is willing to pay to prevent them. The values of lost quality of life were obtained through empirical studies of what people actually pay to reduce their safety and health risks, such as through the purchase of air bags. These costs are on a per injured person basis.

| | |
|--|-------------|
| <input type="checkbox"/> Death. | \$4,360,000 |
| <input type="checkbox"/> Incapacitating injury. | \$220,300 |
| <input type="checkbox"/> Non-incapacitating evident injury | \$56,200 |
| <input type="checkbox"/> Possible injury | \$26,700 |
| <input type="checkbox"/> No injury | \$2,400 |

Source: National Safety Council® Research & Statistics <http://www.nsc.org>
update December, 2010

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| Year | 2009 | 2010 | 2011 |
|-----------------------------|--------------|--------------|--------------|
| Total Societal Costs | \$13,664,022 | \$11,469,214 | \$11,111,484 |
| Property Damage Only | \$2,972,600 | \$2,287,300 | \$2,598,800 |
| Injuries | \$9,281,422 | \$6,361,914 | \$7,102,684 |
| Fatalities | \$1,410,000 | \$2,820,000 | \$1,410,000 |

High Collision Locations

For the City of Shoreline, intersections with 5 or more crashes in a year, or a 3 year collision rate higher than 4 are reviewed for changes that may reduce the collision rate. These are sometimes referred to as “High Frequency Crash Locations” or “High Collision Locations”. When an intersection or section of roadway appears on the HCL list, it may be selected for corrective measures based on the crash rate and type of crash. Analysis of the crash rate at an intersection or on a section of road is one of the techniques used for identifying and prioritizing locations that may need improvement.

Collision Rates

Intersection crash rates are calculated by dividing the number of crashes at an intersection by the volume of vehicles entering the intersection. The annual number of vehicles entering an intersection is calculated by multiplying the average daily approach count (number of vehicles through the intersection) by 365 days.

Collision Reduction Factors – The 3 E’s

Education:

Alerts people to ways they can help ease traffic problems, for example: Reducing their speed or using travel alternatives such as bicycles. The City of Shoreline reaches out to help inform residents about traffic issues through a number of programs such as the NTAP and NSTP, newsletters, neighborhood meetings, and information on our website.

Enforcement:

Utilizes the SPD Traffic Division to focus enforcement efforts on problem areas to increase community awareness and compliance.

Engineering:

Monitors and evaluates traffic and travel patterns within our travel network. Designs, operates and manages facilities for all modes of transportation in order to provide for the safe and efficient movement of people, goods, and services.

Of the three categories above, Education may be the most effective in reducing crashes. When we become aware of how and why crashes happen, we can then take the necessary steps towards making a change for the better.

Although not always our most favorite experience, Enforcement is very effective and very necessary. Without enforcement, we would all be tempted to push the limit of the law, which would put all of us at higher risk of getting into a crash.

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Engineering envelopes all the physical elements that make traveling possible; streets, sidewalks, signs, signals, bridges and more. Engineering has made travel safer, more comfortable, rapid, and convenient.

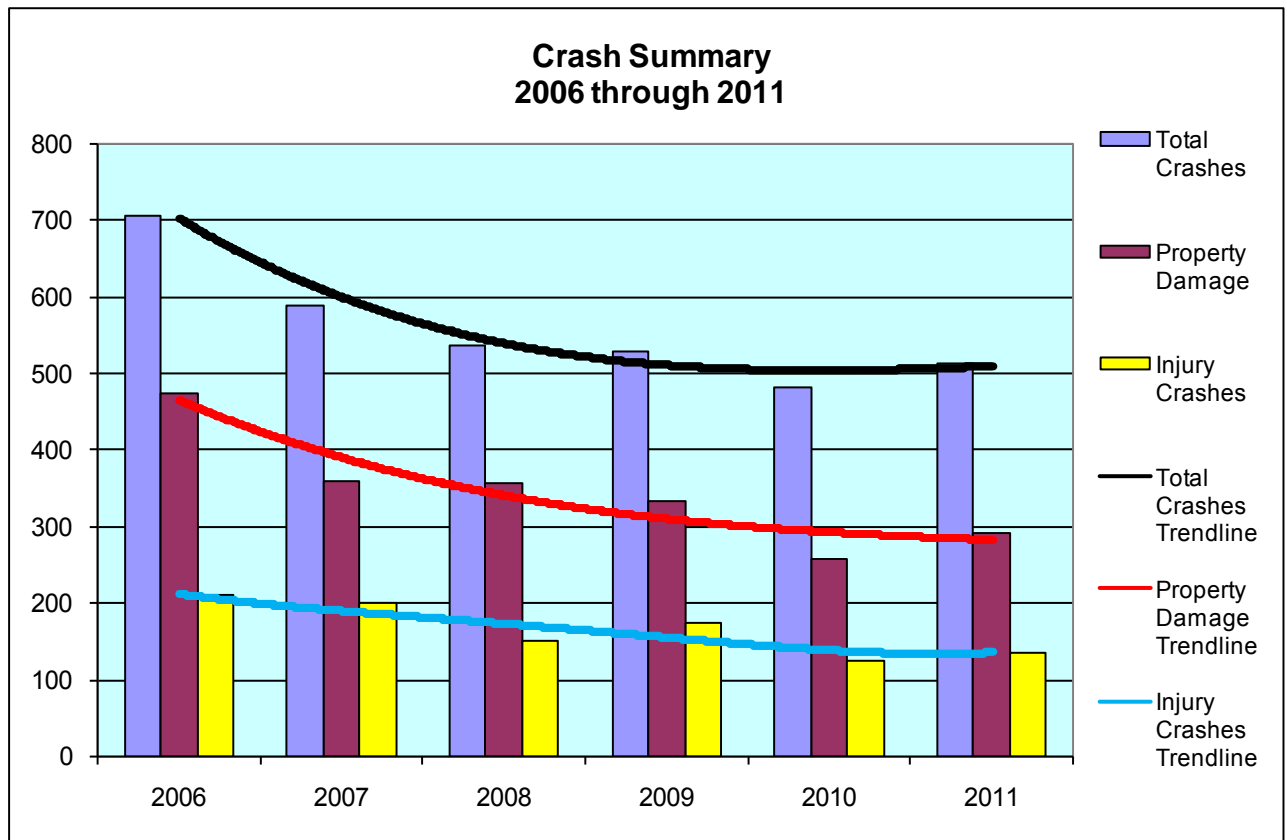
Like a three-legged stool would collapse without one of the legs, so is it with the 3 E's. All three are equally needed to support our transportation system. Ultimately, we as drivers and street users are responsible for the safety of ourselves and others.

- Educate yourself on the rules of the road. If you do not understand what a sign or road marking means, find out.
- Obey the law. The rules & the Patrol Officers are there to protect all of us.
- Always watch for pedestrians & bicyclists. Be exceptionally alert in school zones and near parks and recreational areas where children frequent!
- Be alert. Try not to drive when you are angry, tired or upset. Give yourself enough time to get where you are going without speeding. Just 5 mph. can be the difference between an injury or a fatality. Your time and your car are expendable but a life is not.
- Never drive while under the influence of alcohol and/or drugs! The consequences can be devastating.
- Be a courteous & patient driver, it will be returned to you.

Part II – 2009 - 2010 - 2011 Data

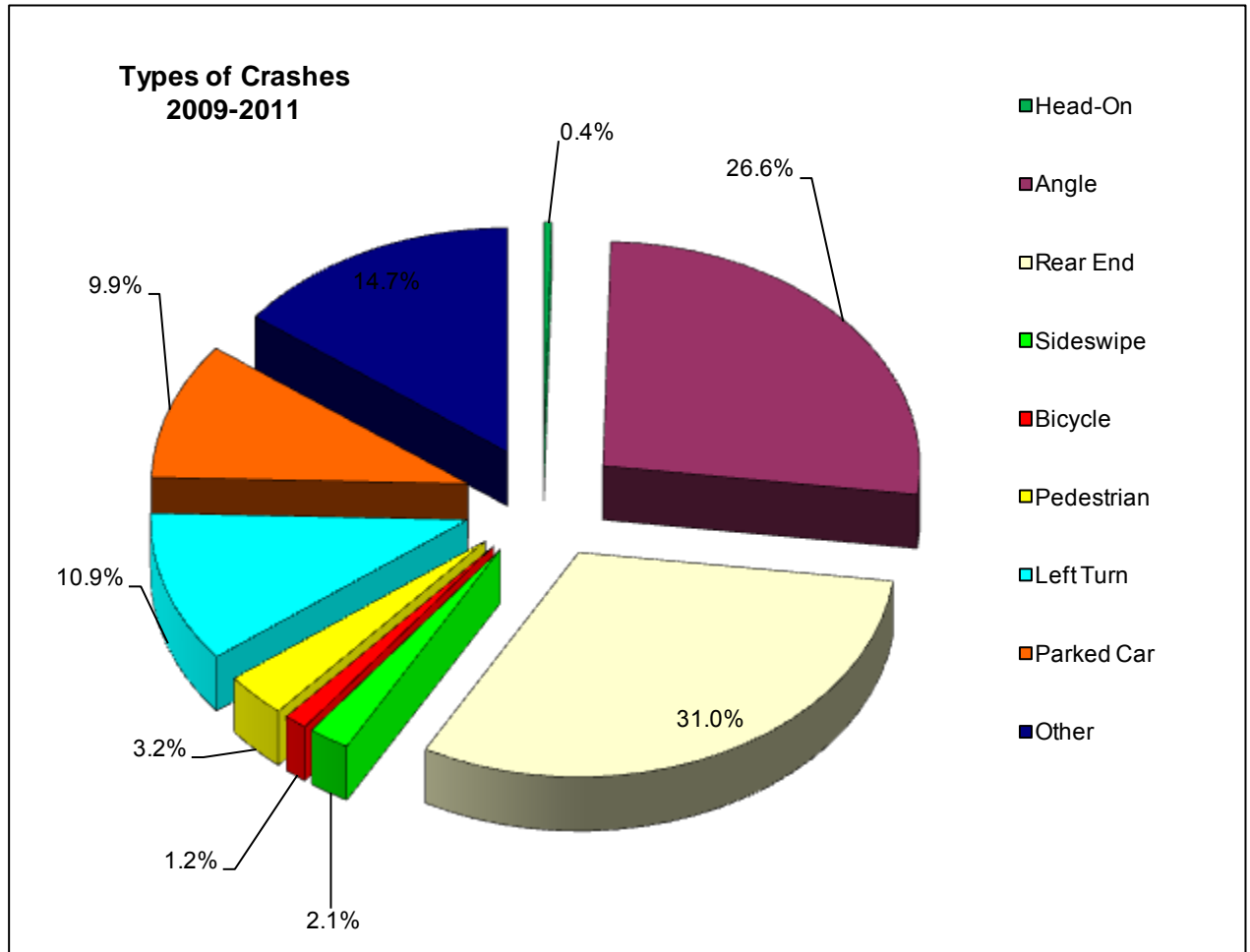
Crash Summary

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|--------------------|------|------|------|------|------|------|
| Total Crashes | 706 | 590 | 537 | 530 | 483 | 514 |
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| Fatal Crashes | 2 | 0 | 0 | 1 | 2 | 1 |



The trend lines highlight that the total crashes and injuries have been decreasing over the last four years.

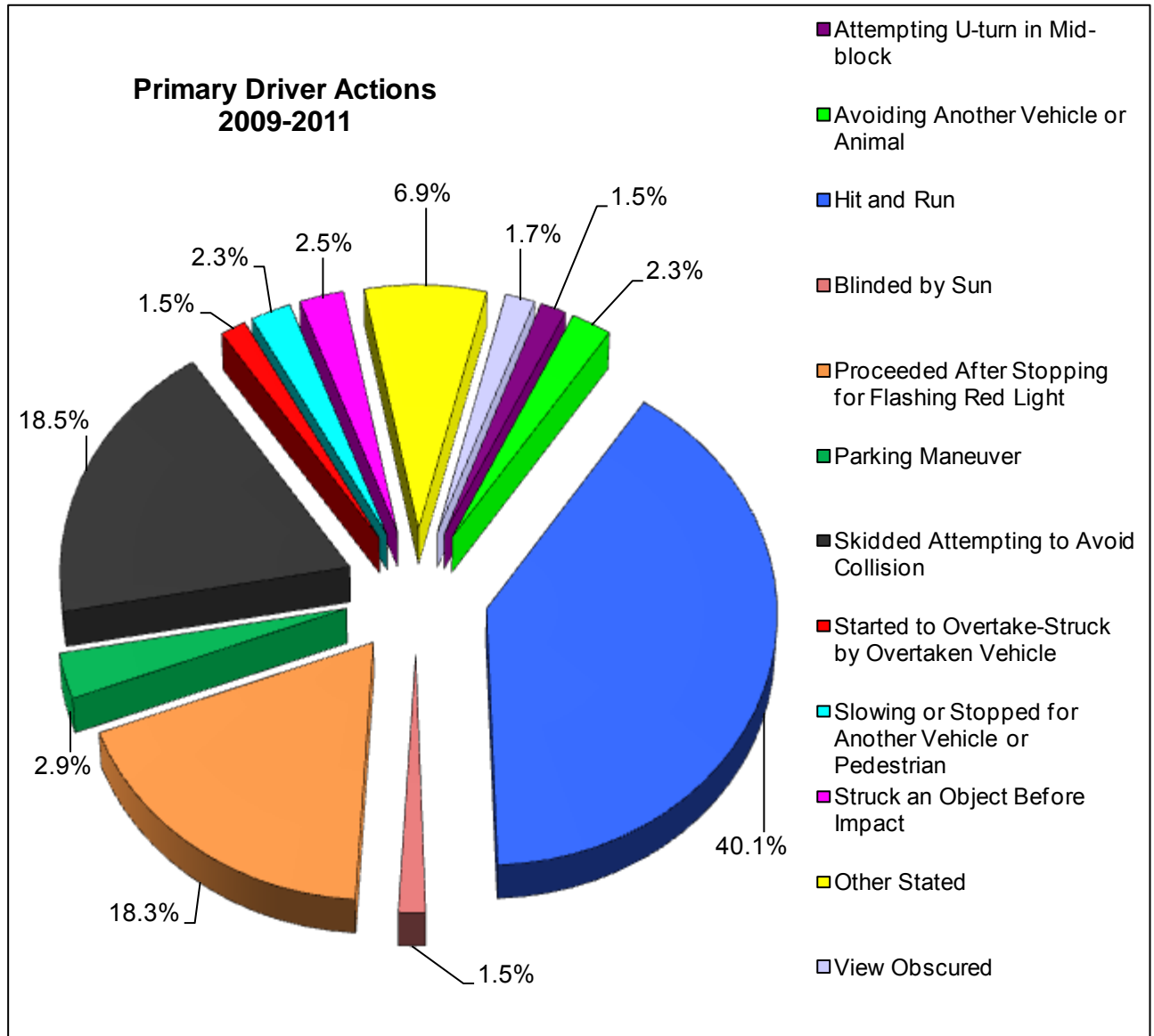
Types of Crashes



Rear-end and right-angle crashes make up around 60% of all reported collisions types on city streets. Crashes involving pedestrian or bicycles make up about 4% of all reported collision types.

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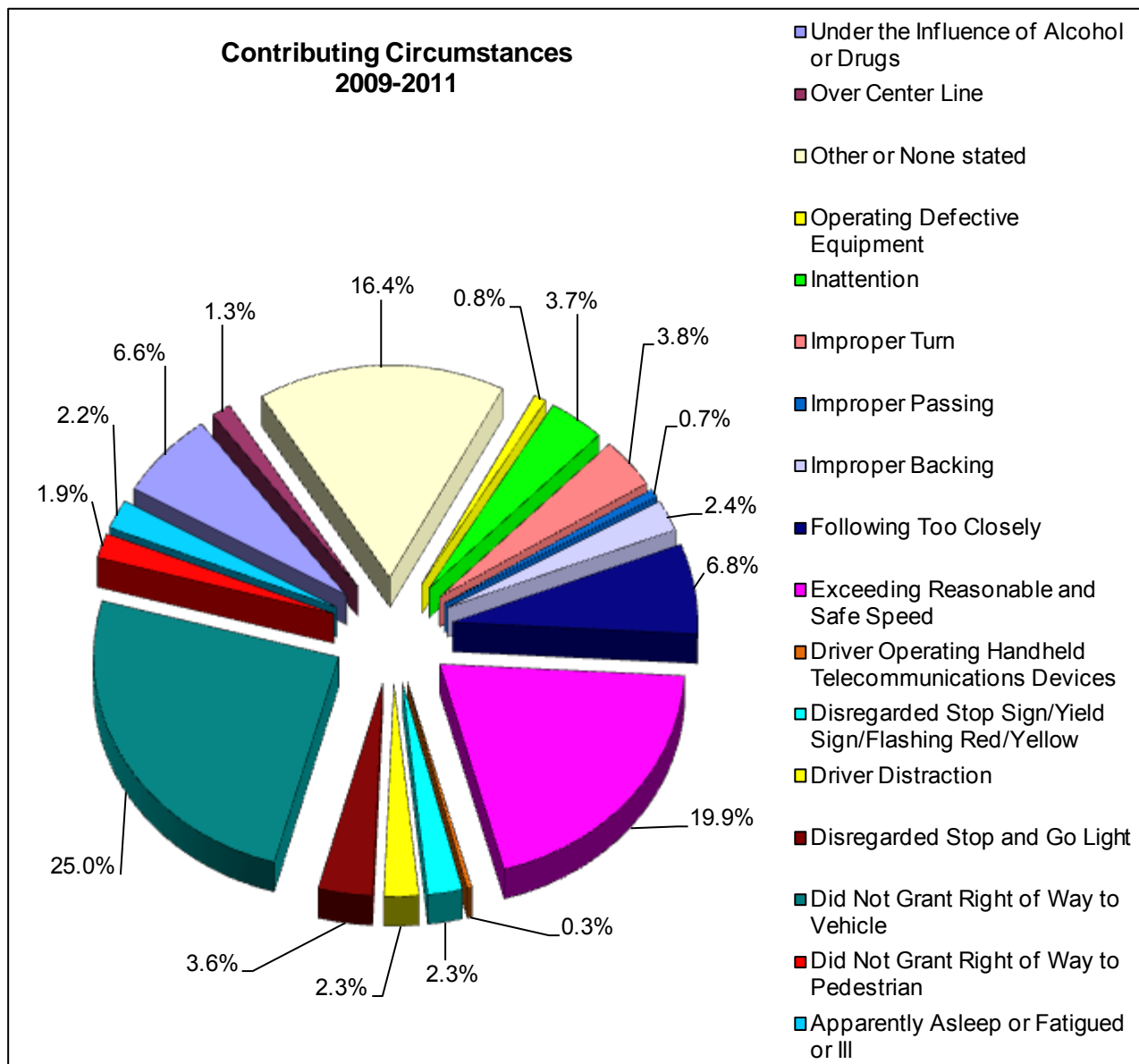
First Harmful Event (Driver Actions)



Hit and Run crashes make up over 40% of all reported collisions.

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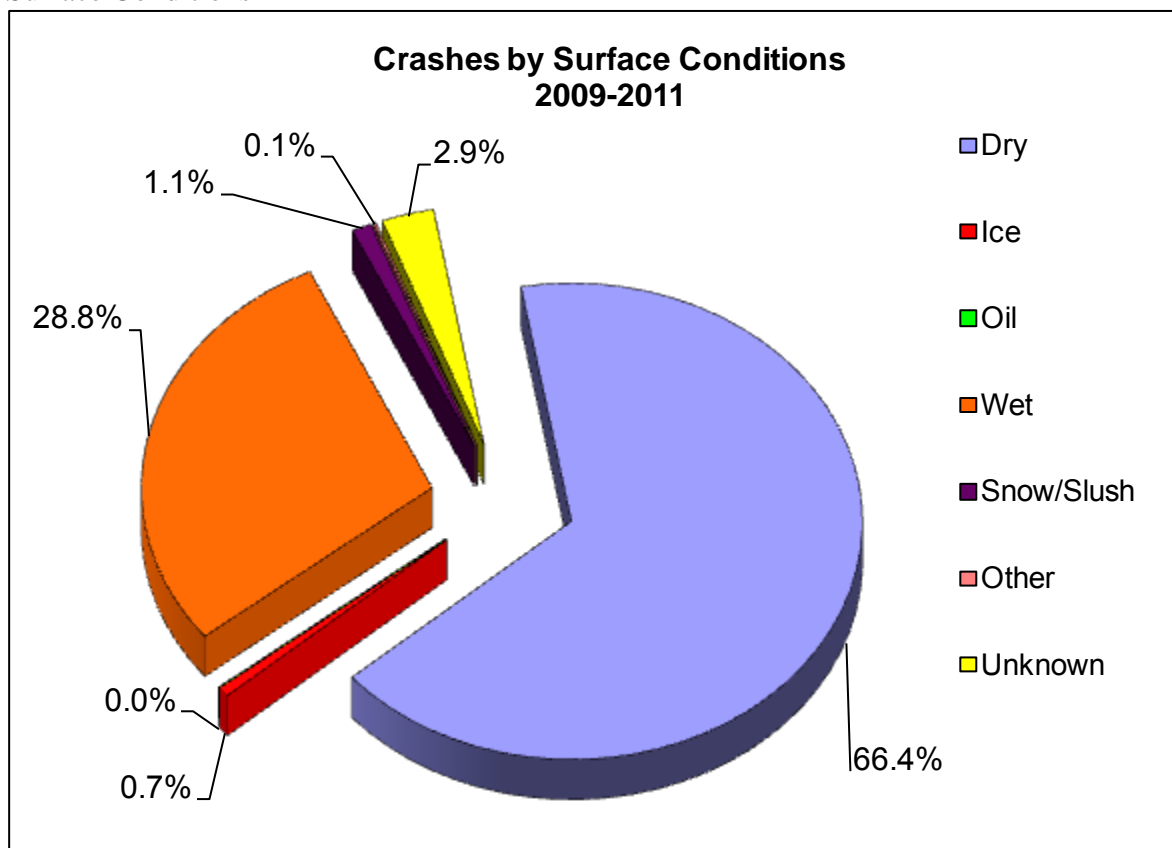
Contributing Circumstances



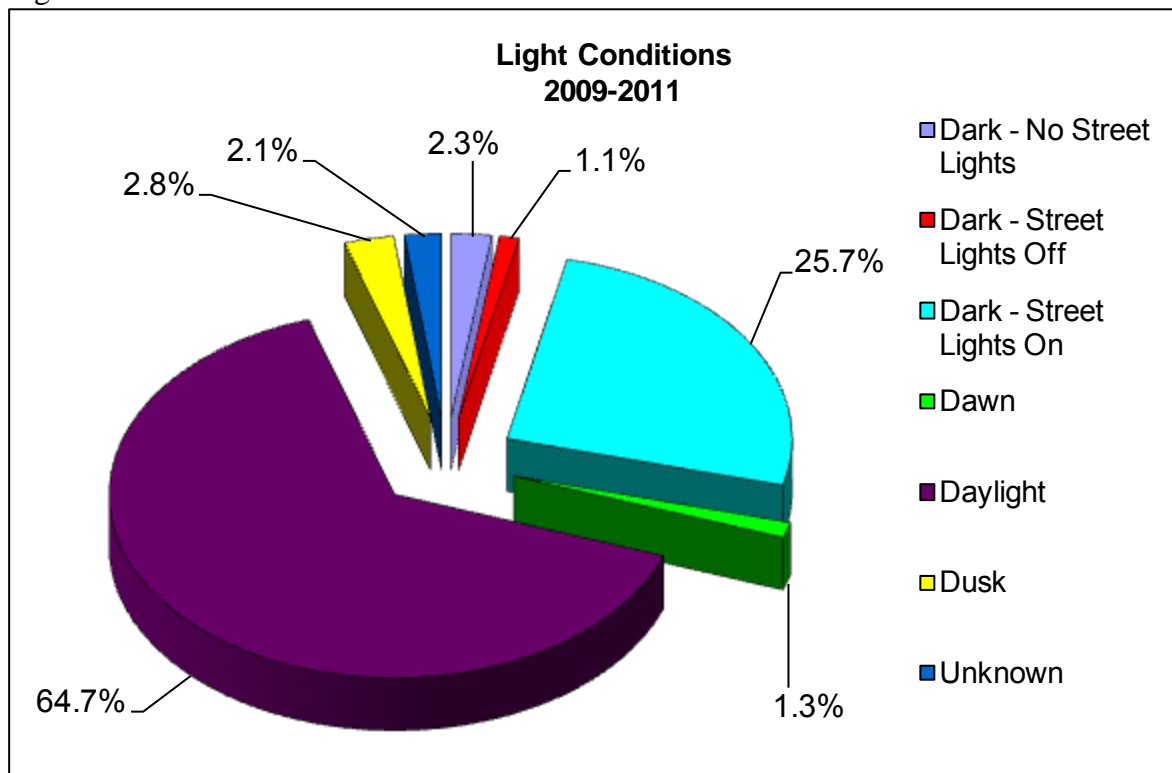
The top two contributing circumstances for crashes in Shoreline are “did not grant right-of-way”, and “exceeding reasonably safe speed”. Combined, they make up almost half of all reported crashes.

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Surface Conditions



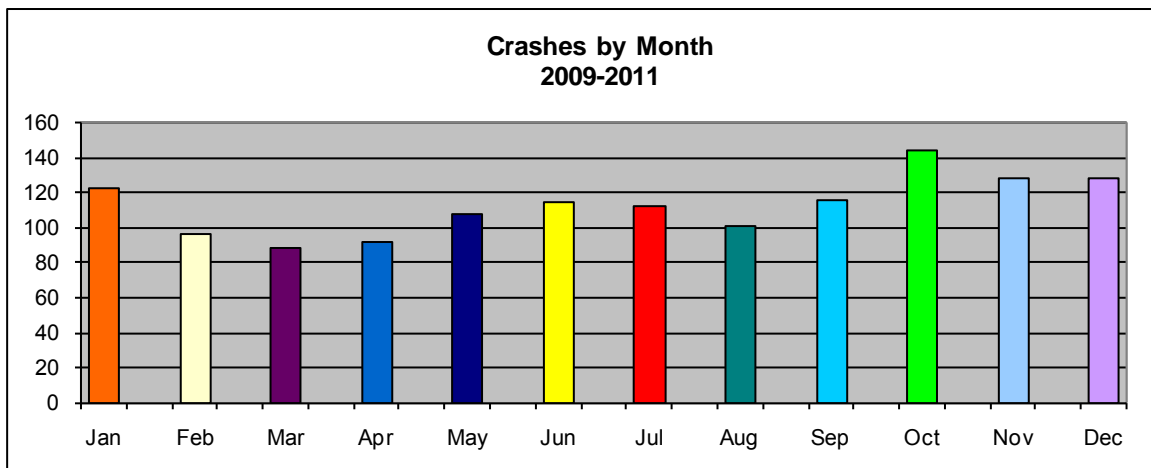
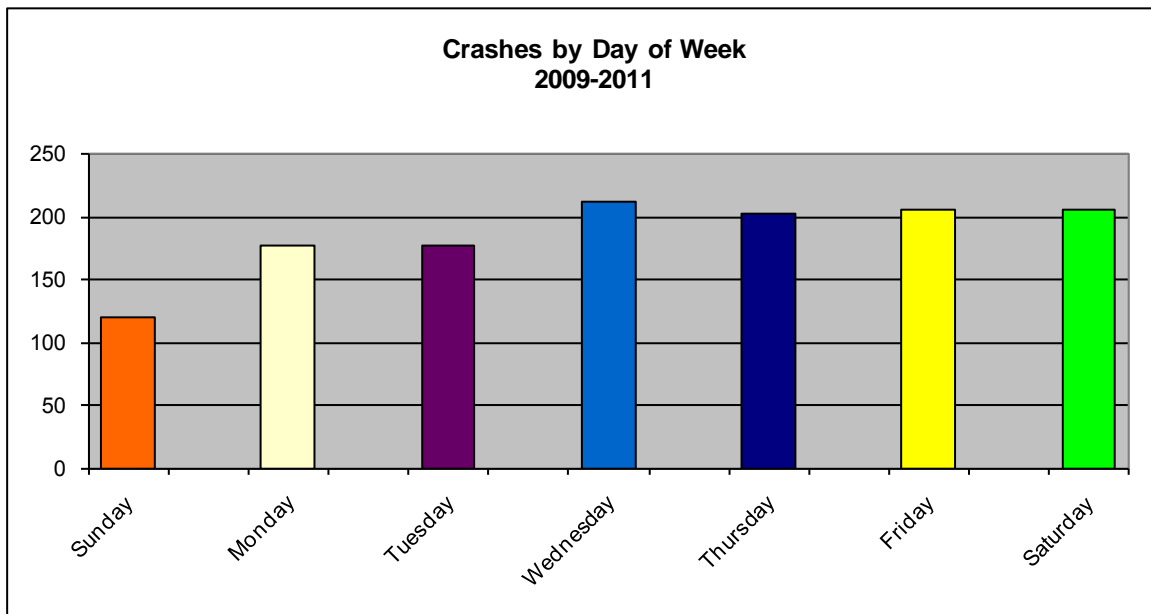
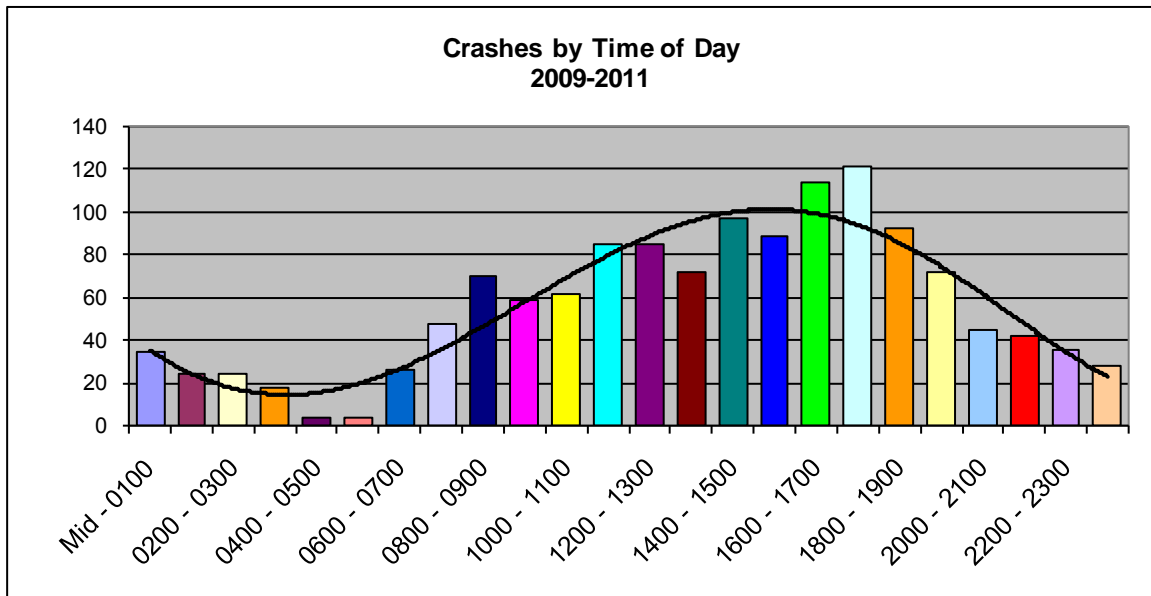
Light Conditions



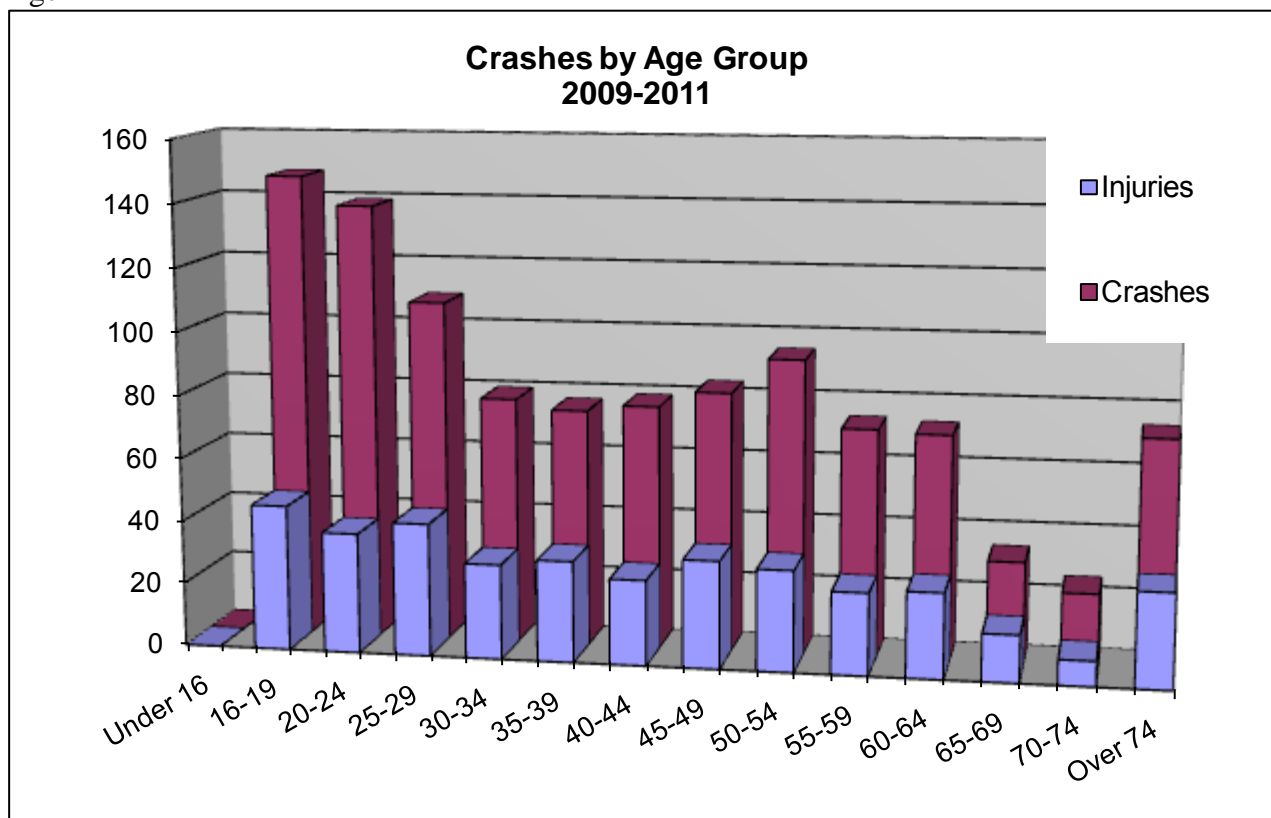
Approximately two-thirds of reported crashes occur in the daylight on dry pavement.

City of Shoreline Traffic Report - 2012

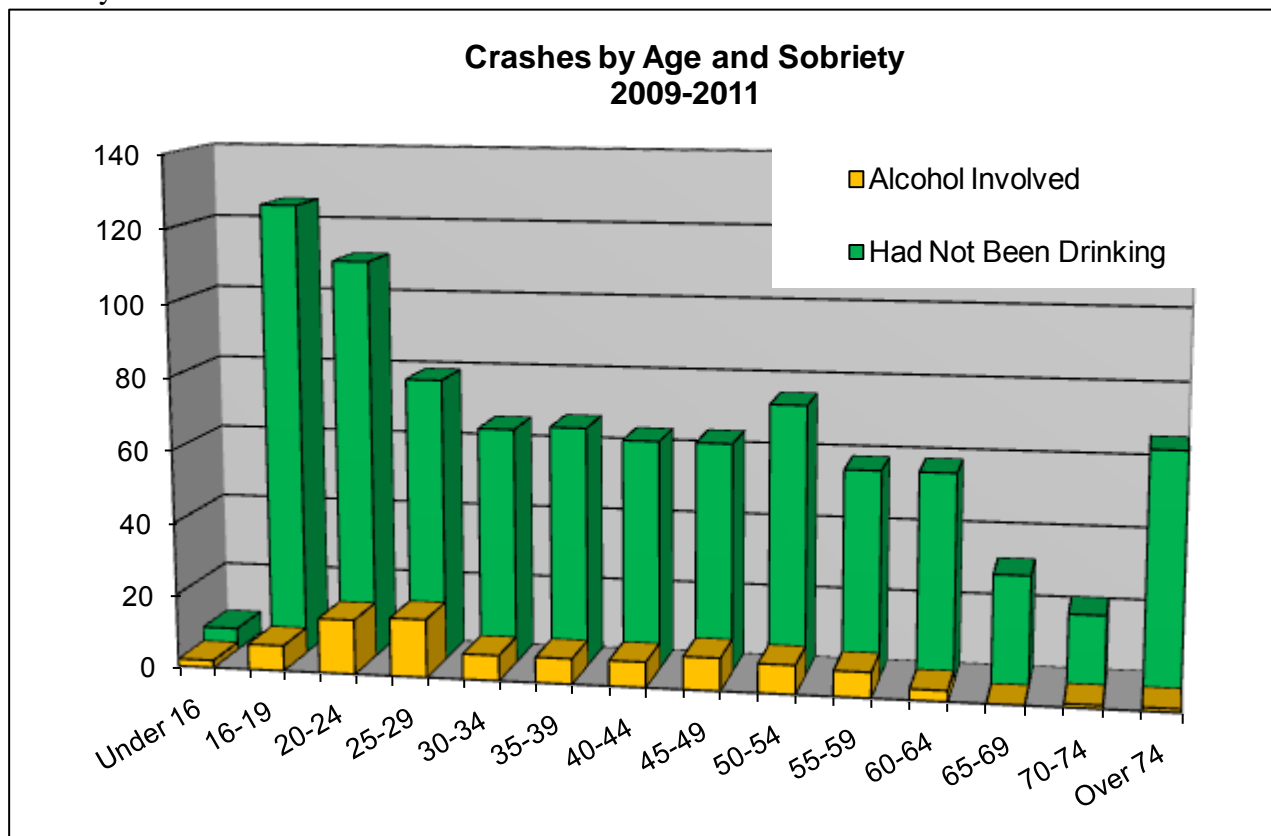
Time Periods



Age



Sobriety



City of Shoreline Traffic Report - 2012

High Accident Locations

Data from 2009 through 2011, Crash rate per million entering vehicles per year

| | Location - Sorted by Rate | signal | # of Crashes | # of Injuries | # of Fatal | Crash Rate | Injury Rate |
|----|--|--------|--------------|---------------|------------|------------|-------------|
| 1 | Linden Ave N & N 182nd St | | 7 | 2 | 0 | 1.66 | 0.47 |
| 2 | Linden Ave N & N 165th St | | 5 | 4 | 0 | 1.22 | 0.98 |
| 3 | Ashworth Ave N & N 192nd St | | 5 | 0 | 0 | 1.16 | 0.00 |
| 4 | 25th Ave NE & NE 150th St | | 6 | 1 | 0 | 0.99 | 0.17 |
| 5 | 3rd Ave NW & NW Richmond Bch Rd | y | 16 | 6 | 0 | 0.78 | 0.29 |
| 6 | Linden Ave N & N 175th St | | 7 | 3 | 0 | 0.69 | 0.30 |
| 7 | Dayton Ave N & N 160th St | y | 7 | 0 | 0 | 0.55 | 0.00 |
| 8 | 5th Ave NE & NE 155th St | y | 7 | 2 | 0 | 0.42 | 0.12 |
| 9 | 5th Ave NE & NE 175th St | y | 9 | 5 | 0 | 0.36 | 0.20 |
| 10 | Meridian Ave N & N 155th St | y | 7 | 5 | 0 | 0.34 | 0.24 |
| 11 | 8th Ave NE & NE 175th St | | 6 | 2 | 0 | 0.34 | 0.11 |
| 12 | Midvale Ave N & N 185th St | y | 5 | 1 | 0 | 0.34 | 0.07 |
| 13 | Westminster Way N & N 155th St | y | 9 | 3 | 0 | 0.32 | 0.11 |
| 14 | 15th Ave NE & NE 168th St | | 5 | 3 | 0 | 0.28 | 0.17 |
| 15 | Aurora Ave N & N 192nd St | y | 9 | 5 | 0 | 0.24 | 0.14 |
| 16 | Aurora Ave N & N 155th St | y | 12 | 6 | 0 | 0.23 | 0.11 |
| 17 | Aurora Village Mall N & N 205th St | y | 5 | 1 | 0 | 0.21 | 0.04 |
| 18 | Meridian Ave N & N 175th St | y | 9 | 2 | 0 | 0.21 | 0.05 |
| 19 | 19th Ave NE & Ballinger Way NE | y | 6 | 5 | 1 | 0.21 | 0.17 |
| 20 | 8th Ave NW & NW Richmond Bch Rd | y | 5 | 3 | 0 | 0.21 | 0.12 |
| 21 | Midvale Ave N & N 175th St | y | 5 | 2 | 0 | 0.19 | 0.08 |
| 22 | Aurora Ave N & N 182nd St | | 8 | 1 | 0 | 0.19 | 0.02 |
| 23 | Aurora Ave N & N 200th St | y | 7 | 3 | 0 | 0.17 | 0.07 |
| 24 | Aurora Ave N & N 175th St | y | 9 | 3 | 0 | 0.16 | 0.05 |
| 25 | Aurora Ave N & N 185th St | y | 7 | 3 | 0 | 0.14 | 0.06 |
| | Location - Sorted by Number of Crashes | signal | # of Crashes | # of Injuries | # of Fatal | Crash Rate | Injury Rate |
| 1 | 3rd Ave NW & NW Richmond Bch Rd | y | 16 | 6 | 0 | 0.78 | 0.29 |
| 2 | Aurora Ave N & N 155th St | y | 12 | 6 | 0 | 0.23 | 0.11 |
| 3 | 5th Ave NE & NE 175th St | y | 9 | 5 | 0 | 0.36 | 0.20 |
| 4 | Westminster Way N & N 155th St | y | 9 | 3 | 0 | 0.32 | 0.11 |
| 5 | Aurora Ave N & N 192nd St | y | 9 | 5 | 0 | 0.24 | 0.14 |
| 6 | Meridian Ave N & N 175th St | y | 9 | 2 | 0 | 0.21 | 0.05 |
| 7 | Aurora Ave N & N 175th St | y | 9 | 3 | 0 | 0.16 | 0.05 |
| 8 | Aurora Ave N & N 182nd St | | 8 | 1 | 0 | 0.19 | 0.02 |
| 9 | Linden Ave N & N 182nd St | | 7 | 2 | 0 | 1.66 | 0.47 |
| 10 | Linden Ave N & N 175th St | | 7 | 3 | 0 | 0.69 | 0.30 |
| 11 | Dayton Ave N & N 160th St | y | 7 | 0 | 0 | 0.55 | 0.00 |
| 12 | 5th Ave NE & NE 155th St | y | 7 | 2 | 0 | 0.42 | 0.12 |
| 13 | Meridian Ave N & N 155th St | y | 7 | 5 | 0 | 0.34 | 0.24 |
| 14 | Aurora Ave N & N 200th St | y | 7 | 3 | 0 | 0.17 | 0.07 |
| 15 | Aurora Ave N & N 185th St | y | 7 | 3 | 0 | 0.14 | 0.06 |
| 16 | 25th Ave NE & NE 150th St | | 6 | 1 | 0 | 0.99 | 0.17 |
| 17 | 8th Ave NE & NE 175th St | | 6 | 2 | 0 | 0.34 | 0.11 |
| 18 | 19th Ave NE & Ballinger Way NE | y | 6 | 5 | 1 | 0.21 | 0.17 |
| 19 | Linden Ave N & N 165th St | | 5 | 4 | 0 | 1.22 | 0.98 |
| 20 | Ashworth Ave N & N 192nd St | | 5 | 0 | 0 | 1.16 | 0.00 |
| 21 | Midvale Ave N & N 185th St | y | 5 | 1 | 0 | 0.34 | 0.07 |
| 22 | 15th Ave NE & NE 168th St | | 5 | 3 | 0 | 0.28 | 0.17 |
| 23 | Aurora Village Mall N & N 205th St | y | 5 | 1 | 0 | 0.21 | 0.04 |
| 24 | 8th Ave NW & NW Richmond Bch Rd | y | 5 | 3 | 0 | 0.21 | 0.12 |
| 25 | Midvale Ave N & N 175th St | y | 5 | 2 | 0 | 0.19 | 0.08 |

City of Shoreline Traffic Report - 2012

High Accident Roadway Segments

Data from 2009 through 2011, Crash rate per million vehicle-miles per year

| | <u>Location</u> | <u># of Crashes</u> | <u># of Injuries</u> | <u># of Fatal</u> | <u>Crash Rate</u> | <u>Injury Rate</u> | <u>volume</u> | <u>length</u> |
|----|--|-------------------------|--------------------------|-----------------------|-----------------------|------------------------|---------------|---------------|
| 1 | N 175th St from Linden Ave N to Aurora Ave N | 7 | 1 | 0 | 21.35 | 3.05 | 7,943 | 199 |
| 2 | NW Innis Arden Way from 6th Ave NW to 9th Ave NW | 8 | 3 | 0 | 13.00 | 4.87 | 2,000 | 1484 |
| 3 | N 205th St from Whitman Ave N to Aurora Ave N | 11 | 4 | 0 | 12.63 | 4.59 | 12,000 | 350 |
| 4 | N 155th St from Aurora Ave N to Midvale Ave N | 10 | 2 | 0 | 10.95 | 2.19 | 12,953 | 340 |
| 5 | Greenwood Ave N from N 145th St to Westminster Way N | 6 | 1 | 0 | 9.01 | 1.50 | 20,319 | 158 |
| 6 | Aurora Ave N from N 199th St to N 200th St | 17 | 9 | 0 | 7.99 | 4.23 | 30,793 | 333 |
| 7 | Aurora Ave N from N 184th St to N 185th St | 12 | 1 | 1 | 7.43 | 0.62 | 36,076 | 216 |
| 8 | N 160th St from Linden Ave N to Aurora Ave N | 8 | 2 | 0 | 7.05 | 1.76 | 8,475 | 646 |
| 9 | N 185th St from Burke Ave N to Meridian Ave N | 6 | 2 | 0 | 6.86 | 2.29 | 12,371 | 341 |
| 10 | 15th Ave NE from NE 172nd St to NE 175th St | 14 | 4 | 0 | 6.76 | 1.93 | 15,016 | 665 |
| 11 | 15th Ave NE from NE Perkins Wy to NE 190th St | 5 | 3 | 0 | 6.62 | 3.97 | 12,391 | 294 |
| 12 | 15th Ave NE from NE 145th St to NE 146th St | 7 | 1 | 0 | 6.48 | 0.93 | 15,689 | 332 |
| 13 | Aurora Ave N from N 185th St to N 192nd St | 27 | 8 | 0 | 5.98 | 1.77 | 30,793 | 707 |
| 14 | N 175th St from Aurora Ave N to Midvale Ave N | 10 | 3 | 0 | 5.70 | 1.71 | 22,612 | 374 |
| 15 | NW Richmond Beach Rd from 2nd Ave NW to 3rd Ave NW | 7 | 3 | 0 | 5.63 | 2.41 | 17,438 | 344 |
| 16 | 15th Ave NE from Forest Park Dr NE to NE 205th St | 16 | 7 | 0 | 4.85 | 2.12 | 13,175 | 1208 |
| 17 | 15th Ave NE from NE 170th St to NE 171st St | 5 | 1 | 0 | 4.78 | 0.96 | 15,016 | 336 |
| 18 | Aurora Ave N from N 160th St to N 163rd St | 23 | 10 | 0 | 4.66 | 2.03 | 36,076 | 660 |
| 19 | Aurora Ave N from N 195th St to Firlands Way N | 7 | 3 | 0 | 4.61 | 1.97 | 30,793 | 238 |
| 20 | Aurora Ave N from Ronald PI N to N 175th St | 15 | 2 | 0 | 4.58 | 0.61 | 36,076 | 438 |
| 21 | N 155th St from Linden Ave N to Aurora Ave N | 5 | 5 | 0 | 4.54 | 4.54 | 13,990 | 380 |
| 22 | Aurora Ave N from Firlands Way N to N 198th St | 12 | 6 | 0 | 4.34 | 2.17 | 30,793 | 433 |
| 23 | N 185th St from Linden Ave N to Aurora Ave N | 8 | 3 | 0 | 4.25 | 1.59 | 13,639 | 665 |
| 24 | 19th Ave NE from Ballinger Way NE to NE 205th St | 7 | 1 | 0 | 4.13 | 0.59 | 7,072 | 1156 |
| 25 | Aurora Ave N from N 198th St to N 199th St | 8 | 1 | 0 | 3.83 | 0.48 | 30,793 | 327 |

City of Shoreline Traffic Report - 2012

High Accident Roadway Segments

Data from 2007 through 2009, sorted by number of reported crashes
Crash rate per million vehicle-miles per year

| | Location | # of Crashes | # of Injuries | # of Fatal | Crash Rate | Injury Rate | volume | length |
|----|--|-----------------|------------------|---------------|---------------|----------------|--------|--------|
| 1 | Aurora Ave N from N 185th St to N 192nd St | 27 | 8 | 0 | 5.98 | 1.77 | 30,793 | 707 |
| 2 | Aurora Ave N from N 160th St to N 163rd St | 23 | 10 | 0 | 4.66 | 2.03 | 36,076 | 660 |
| 3 | Aurora Ave N from N 152nd St to N 155th St | 23 | 8 | 0 | 3.50 | 1.22 | 35,273 | 898 |
| 4 | Aurora Ave N from N 200th St to N 205th St | 23 | 6 | 0 | 2.76 | 0.72 | 30,392 | 1320 |
| 5 | Aurora Ave N from N 175th St to Ronald PI N | 20 | 11 | 0 | 2.31 | 1.27 | 36,076 | 1156 |
| 6 | Aurora Ave N from N 167th St to N 170th St | 19 | 8 | 0 | 3.82 | 1.61 | 36,076 | 665 |
| 7 | N 175th St from Meridian Ave N to Corliss Ave N | 19 | 9 | 0 | 3.41 | 1.62 | 30,255 | 888 |
| 8 | Aurora Ave N from N 199th St to N 200th St | 17 | 9 | 0 | 7.99 | 4.23 | 30,793 | 333 |
| 9 | Ballinger Way NE from 19th Ave NE to NE 205th St | 17 | 11 | 0 | 2.44 | 1.58 | 20,577 | 1630 |
| 10 | 15th Ave NE from Forest Park Dr NE to NE 205th St | 16 | 7 | 0 | 4.85 | 2.12 | 13,175 | 1208 |
| 11 | Aurora Ave N from N 155th St to Westminster Way N | 16 | 10 | 0 | 2.30 | 1.44 | 33,455 | 1003 |
| 12 | Aurora Ave N from Ronald PI N to N 175th St | 15 | 2 | 0 | 4.58 | 0.61 | 36,076 | 438 |
| 13 | Aurora Ave N from N 192nd St to N 195th St | 15 | 11 | 0 | 2.38 | 1.75 | 30,793 | 987 |
| 14 | 15th Ave NE from NE 172nd St to NE 175th St | 14 | 4 | 0 | 6.76 | 1.93 | 15,016 | 665 |
| 15 | N 175th St from Midvale Ave N to Ashworth Ave N | 14 | 9 | 0 | 3.05 | 1.96 | 22,612 | 979 |
| 16 | Aurora Ave N from N 149th St to N 152nd St | 13 | 6 | 0 | 2.28 | 1.05 | 35,273 | 779 |
| 17 | Aurora Ave N from N 184th St to N 185th St | 12 | 1 | 1 | 7.43 | 0.62 | 36,076 | 216 |
| 18 | Aurora Ave N from Firlands Way N to N 198th St | 12 | 6 | 0 | 4.34 | 2.17 | 30,793 | 433 |
| 19 | Aurora Ave N from N 170th St to Ronald PI N | 12 | 5 | 0 | 1.90 | 0.79 | 36,076 | 845 |
| 20 | Aurora Ave N from N 145th St to N 149th St | 12 | 1 | 0 | 1.67 | 0.14 | 35,273 | 982 |
| 21 | N 205th St from Whitman Ave N to Aurora Ave N | 11 | 4 | 0 | 12.63 | 4.59 | 12,000 | 350 |
| 22 | Aurora Ave N from N 163rd St to N 165th St | 11 | 0 | 0 | 2.23 | 0.00 | 36,076 | 660 |
| 23 | N 155th St from Aurora Ave N to Midvale Ave N | 10 | 2 | 0 | 10.95 | 2.19 | 12,953 | 340 |
| 24 | N 175th St from Aurora Ave N to Midvale Ave N | 10 | 3 | 0 | 5.70 | 1.71 | 22,612 | 374 |
| 25 | NW Richmond Beach Rd from 3rd Ave NW to 8th Ave NW | 9 | 5 | 0 | 1.88 | 1.04 | 17,438 | 1327 |

Corridor Crash Statistics

3-Year Crash Rate for Selected Corridors

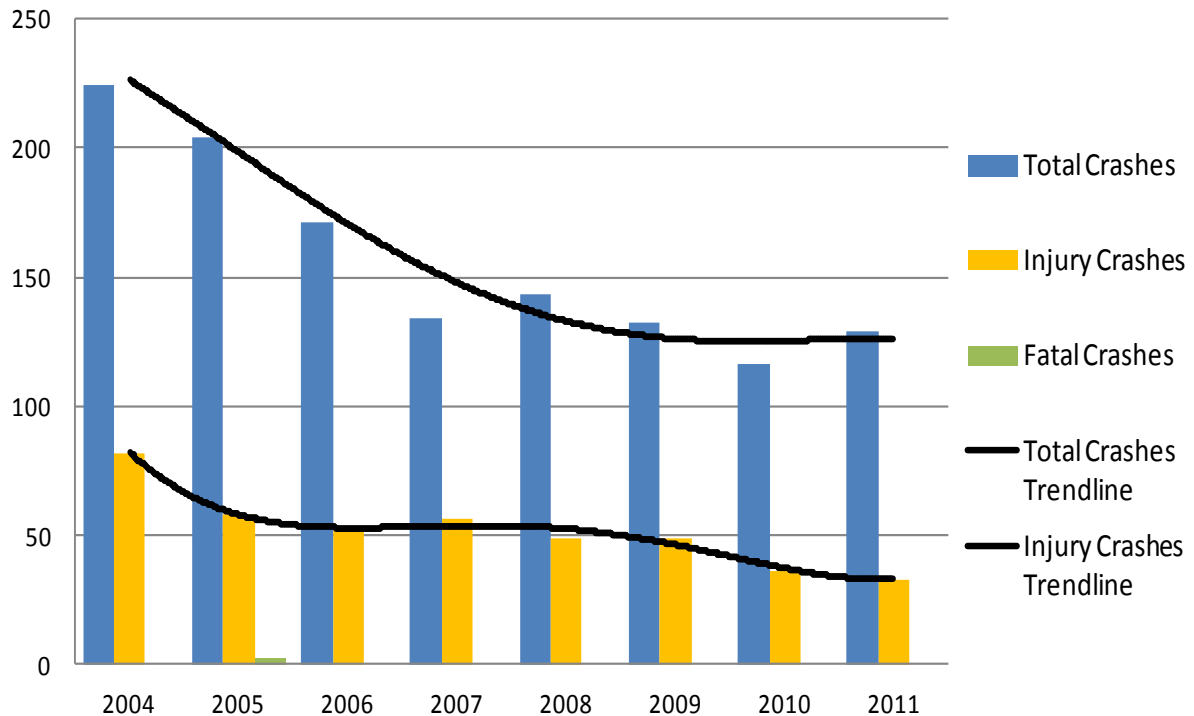
Reported collisions from 1/1/2009 to 12/31/2011

| Route | # of Crashes | Crash Rate | Length |
|--|--------------|------------|--------|
| 15th Ave NE n/o NE 175th St | 64 | 2.89 | 8,095 |
| 15th Ave NE s/o NE 175th St | 83 | 3.36 | 7,950 |
| | | | |
| Aurora Ave N between N 145th St and N 165th St | 133 | 3.37 | 5,307 |
| Aurora Ave N between N 165th St and N 185th St | 121 | 3.06 | 5,308 |
| Aurora Ave N between N 185th St and N 205th St | 128 | 3.52 | 5,313 |
| | | | |
| Richmond Beach Rd w/o 8th Ave NW (to 24th Ave NW) | 20 | 1.39 | 6,305 |
| Richmond Beach Rd e/o 8th Ave NW (to Aurora Ave N) | 76 | 3.94 | 5,328 |

Aurora Ave N Crash Trends

□

Aurora Ave N Collisions



Aurora Ave N modification work began in 2004. Overall, the corridor has seen a 42% reduction in the total number of collisions, and a 60% decrease in the number of injury collisions since the improvements were started.

Safety Tips

Tips for proper safety restraint use:

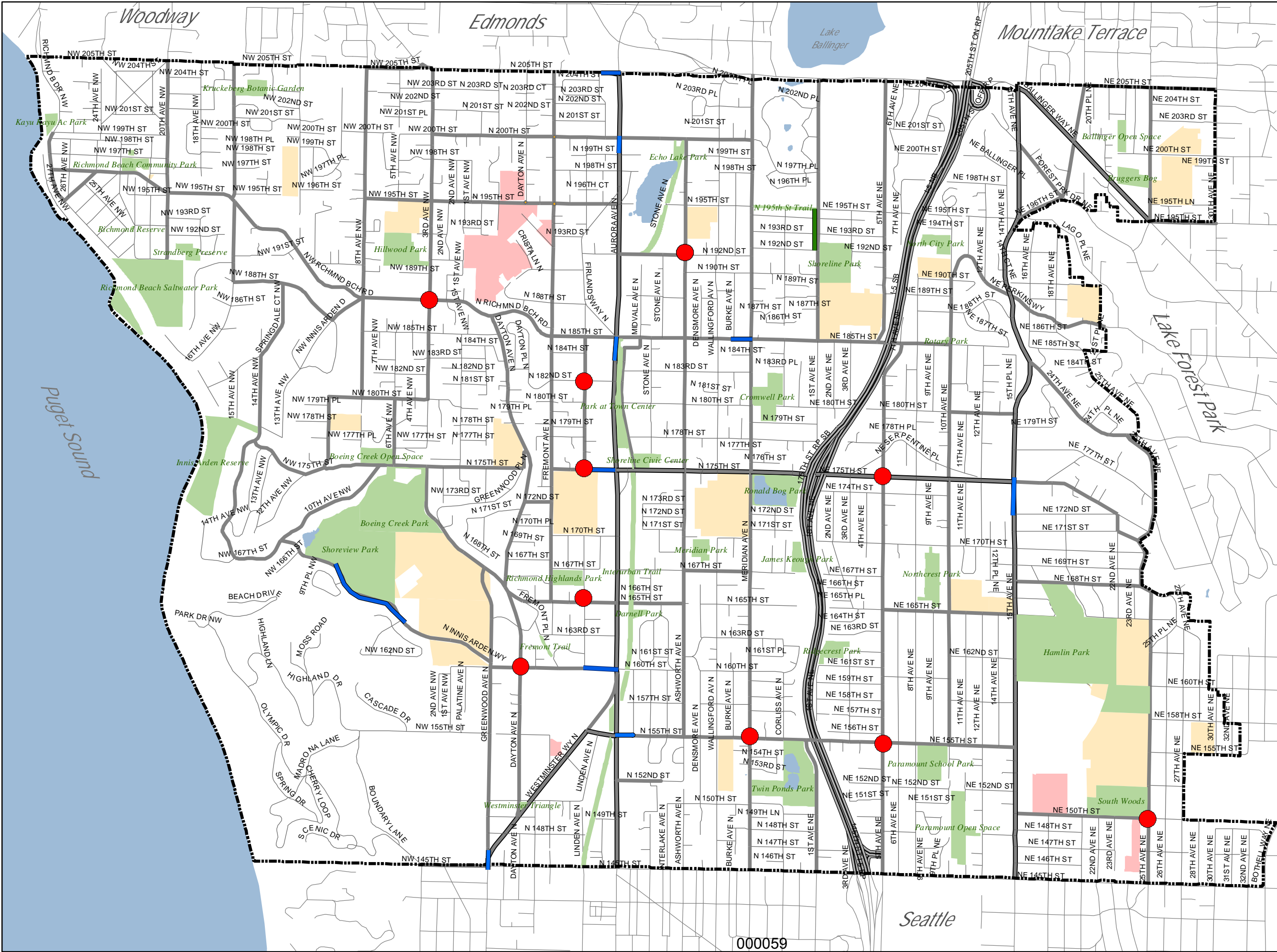
- *Wear lap belts low – over the hips, not the stomach*
- *Adjust the head rest to the center of the passenger's ears*
- *If a shoulder belt crosses the face of a child, put it behind him or her*
- *Make sure the child safety seat is buckled into the vehicle correctly and that the child is likewise buckled properly in the seat.*

Tips for the motorist to reduce pedestrian collisions:

- *Stop for pedestrians in unmarked or marked crosswalks – it's the law! Crosswalks exist at all intersections. White lines are not needed to define a legal crosswalk*
- *Stop 20 to 50 feet before you reach the unmarked or marked crosswalk occupied by a pedestrian. This will allow other drivers to see past your vehicle.*
- *When a vehicle ahead of you or in an adjacent lane stops at an intersection, you should expect to stop for a pedestrian.*
- *When backing out of driveways and parking lots, look for pedestrians (especially children) behind you.*
- *Give older adults or disabled pedestrians extra time to get across the street*
- *Use extra caution when driving in neighborhoods where children might be playing, near schools, and near playgrounds.*
- *Obey 20 MPH school area speed limits*
- *Stop whenever you come to a stopped school bus whether its lights are flashing or not.*

Tips for pedestrians to safely cross a street:

- *Always stop at the edge of the roadway before crossing. Look left, right, then left again before entering the street.*
- *Make eye contact with drivers before crossing the street.*
- *Continue to look both left and right while crossing.*
- *On multi-lane roadways, always verify that the adjacent travel lane is clear or stopped before stepping into the next lane.*
- *Cross at corners, not mid-block. That's where drivers expect to find pedestrians and that is where legal crosswalks exist if white lines are not marked on the street.*
- *Obey the "Walk" and "Don't Walk" symbols at traffic signals, but do not assume that drivers are always going to respect your right to cross the street.*
- *Wear reflective or light colored clothing at night. Or even better, carry a flashlight.*
- *Alcohol not only alters your driving ability, but also your walking ability. Your overall judgment is hindered, such as accurately determining the distance and speed of approaching traffic*





SHORELINE

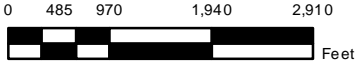
Geographic Information System

Attachment B

Intersections and Roadway Segments with Highest Average 3-year Accident Rate

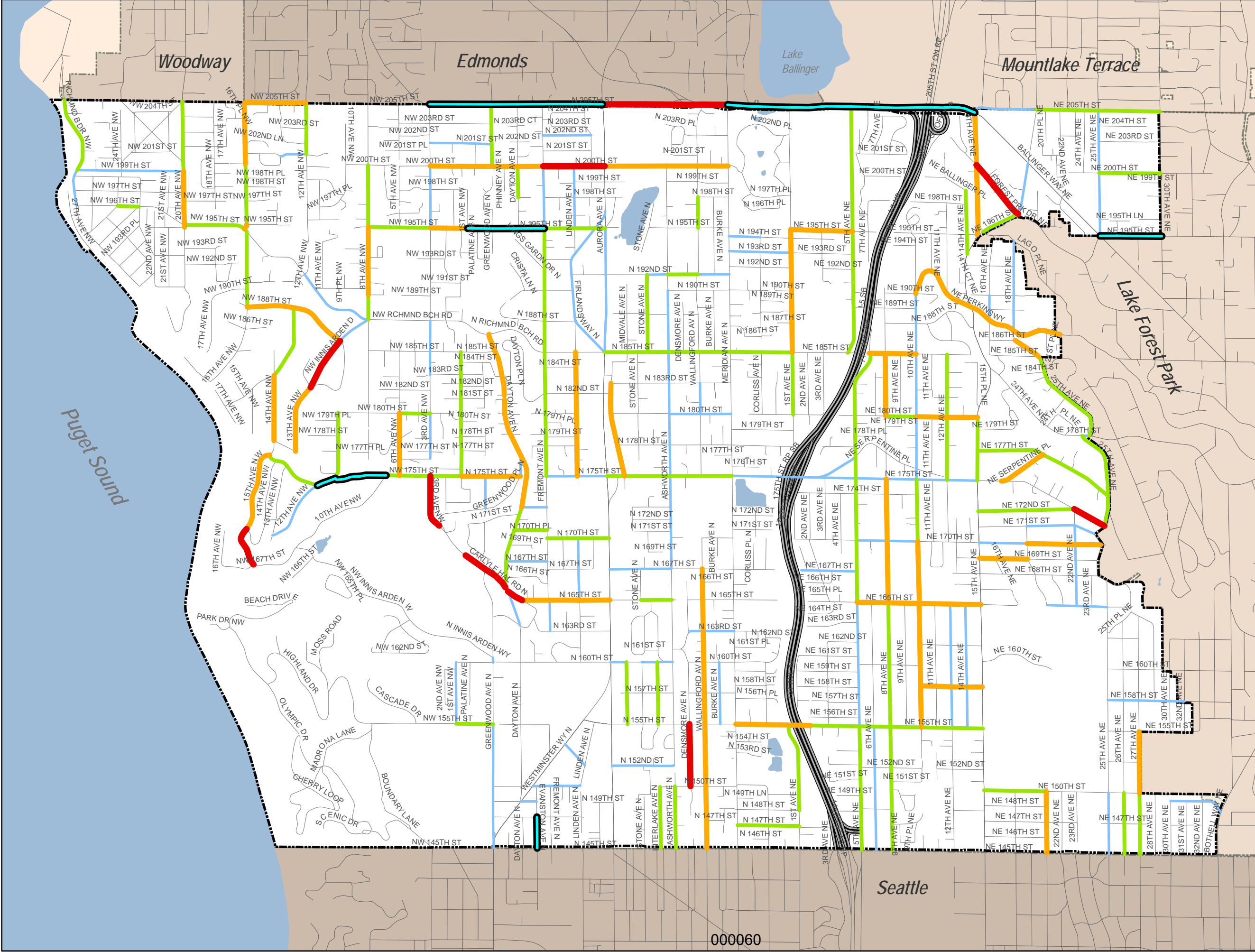
2009 through 2011 data

-  Intersections
-  Segments



City of Shoreline
Mark J. Relph, Public Works Director
Rich Meredith, City Traffic Engineer
17500 Midvale Ave N
Shoreline, WA 98133
(206) 801-2700
www.shorelinewa.gov

Map Date: 2013
No warranties of any sort, including accuracy, fitness, or merchantability, accompany this product.



SHORELINE

Geographic Information System

Attachment B

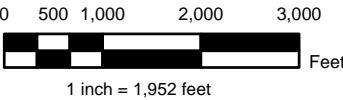
Speed Differential Map 2011

Difference Between 85th Percentile Speeds* and Posted Speed Limit**

Legend

- 12 MPH and over
- 10 - 11 MPH over
- 8 - 9 MPH over
- 6 - 7 MPH over
- 4 - 5 MPH over

* 24-Hour Average Weekday Traffic (Combined Two-Directional Totals)
** Current approved speed limits: Shoreline Municipal Code 10.20.010 Speed Limits; WAC 308-330-423



City of Shoreline
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Shoreline, WA 98133
(206) 801-2700
www.shorelinewa.gov

Map Data: Through December 2011
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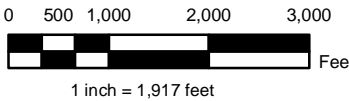
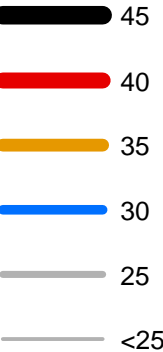
Geographic Information System

City of Shoreline Traffic Speed Map 2011

24-Hour Average Weekday Traffic
(Combined Two-Directional Totals)

Legend

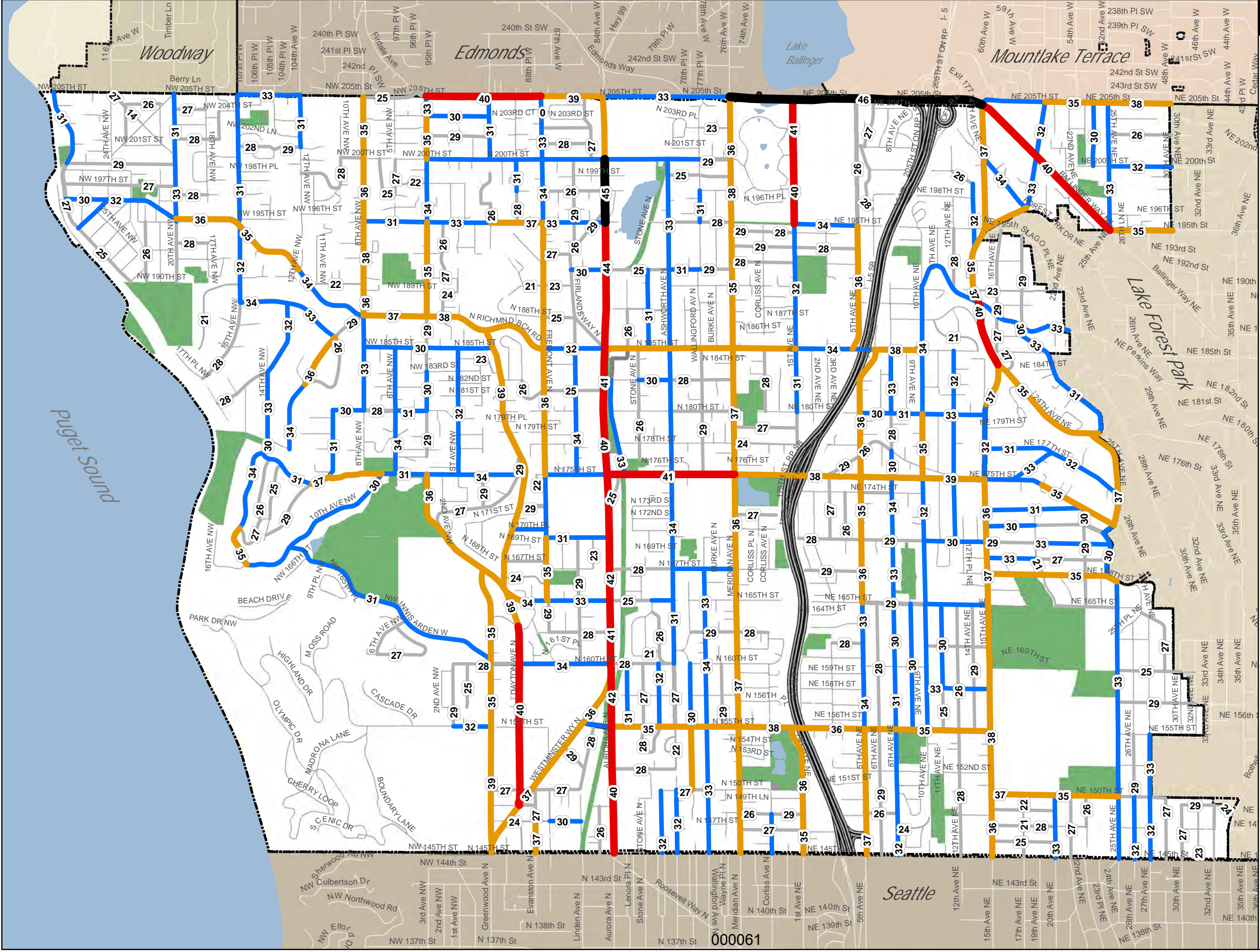
Traffic Speeds

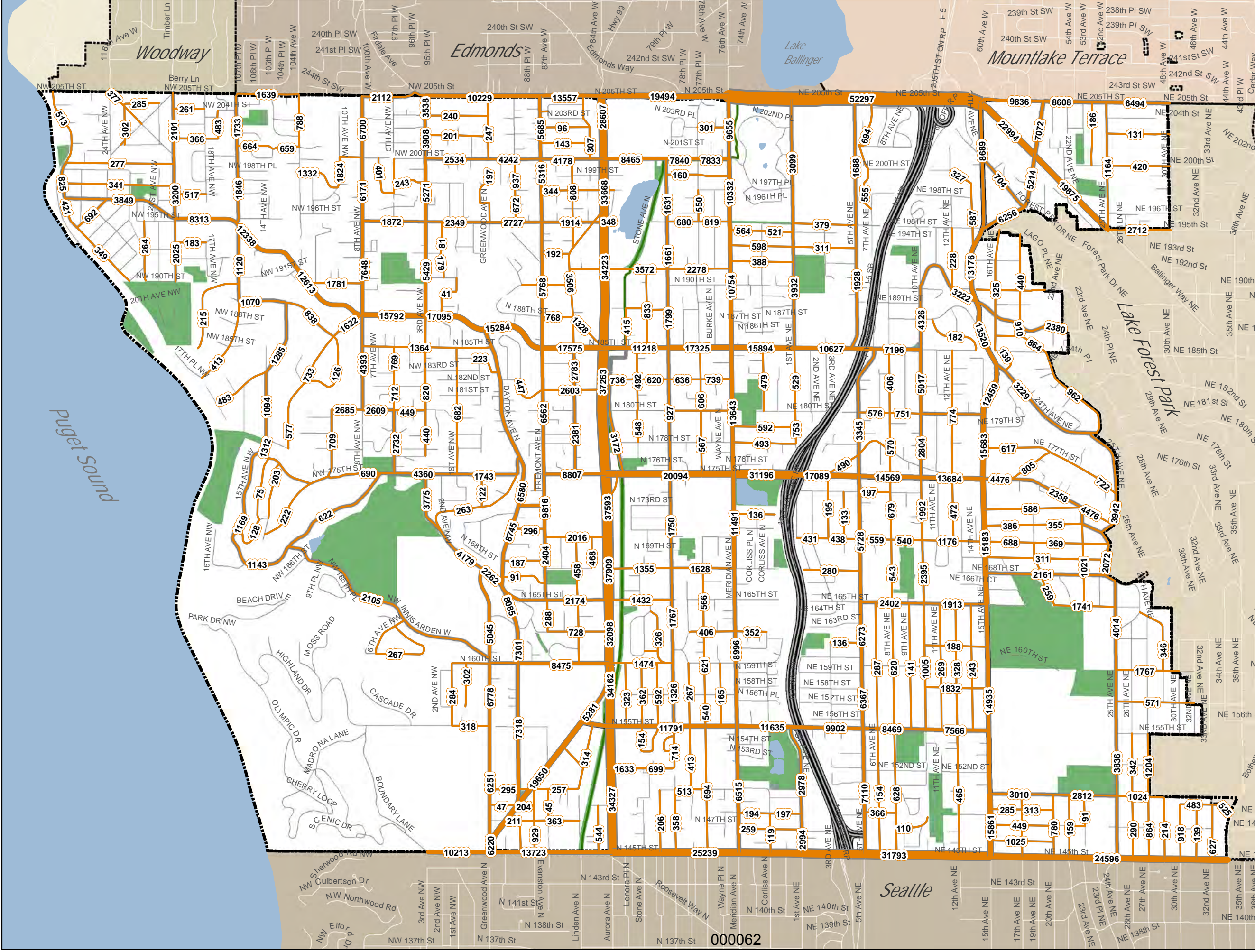


City of Shoreline
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Map Data: Through December 2011

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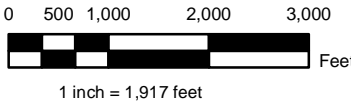
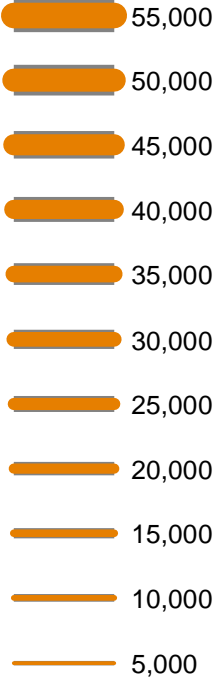
Geographic Information System

City of Shoreline
Traffic Flow Map
2011

24-Hour Average Weekday Traffic
(Combined Two-Directional Totals)

Legend

Avg Weekday Traffic Vol:



City of Shoreline
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