

MEMORANDUM

Date:	December 4, 2008	TG:	08296.00
To:	Steve Clark, City of Burien		
From:	Dan McKinney Jr., Transpo Group Scott Lee, Transpo Group		
Subject:	Goat Hill Speed Study		

This memorandum summarizes the results of a speed study performed in the Goat Hill Neighborhood of Burien. Specifically, speeds and traffic volumes were monitored along the corridor of SW 130 Street/Shorewood Drive corridor between 14th Avenue SW and Shorewood Place at 6 locations. The study was performed to determine if a speeding problem exists within the neighborhood and recommend measures to help reduce speeds as appropriate. This memorandum will discuss the following:

- Roadway Description
- Data Collection and Results
- Collision Data
- Neighborhood Traffic Calming
- Recommendations

Roadway Description

The roadways providing access to the Goat Hill Neighborhood serve residential traffic via Ambaum Boulevard SW and are not considered “cut through” routes for general traffic. The study roadways consist of two lanes and serve as residential collector with direct access to numerous driveways. Currently the posted speed limit along the study roadways within the Goat Hill Neighborhood is 25 mph with 15 mph and 20 mph advisory speeds around some of the sharper curves. For general reference, Attachment 1 illustrates the approximate location and type of traffic advisory signs within the study area.

Pavement markings distinguishing the centerline are present along all of the study roadways with the exception of Shorecrest Drive. Pavement markings along the shoulders are provided along SW 130th Street, 16th Avenue SW, and SW 131st Street. The topography within the Goat Hill Neighborhood includes grades up to 16 percent and various curves, which influence vehicle speed depending on the location and direction of travel.

Data Collection and Results

Speed data and traffic volumes were collected at six locations along the corridor for seven consecutive days in October 2008. The six locations studied are listed below and illustrated in Attachment 2.

- Location 1 - SW 130th Street west of 14th Avenue SW
- Location 2 – 16th Avenue SW north of SW 131st Street
- Location 3 – SW 131st Street east of Shorewood Drive
- Location 4 – Shorewood Drive north of SW 131st Street
- Location 5 – Shorecrest Drive west of Shorewood Drive

- Location 6 – Shorewood Drive north of Shorewood Place

The average daily traffic volumes and speed data are summarized in Table 1. This includes key speed data indicators such as the average speed, 85th percentile speed, 10 mph pace, percent in pace, and percent of vehicles exceeding the speed limit. These indicators are used to help identify if a speeding problem exists. The detailed meaning and purpose of measuring these indicators are described below the table.

Table 1. Traffic Volume and Speed Study Summary

Location	Direction	ADT ²	Average Speed (mph)	85th Percentile (mph)	10 mph Pace	Percent in Pace	Percent of Vehicles Exceeding Speed Limit ³
1	EB	640	24	30	21 – 30	68.0%	12%
	WB	655	24	30	21 – 30	64.4%	12%
2	NB	570	26	30	21 – 30	80.1%	13%
	SB	595	29	34	26 – 35	81.3%	35%
3	EB	575	22	27	16 – 25	75.5%	1%
	WB	580	21	25	16 – 25	84.6%	0%
4	EB	485	24	29	21 – 30	75.3%	7%
	WB	500	23	28	21 – 30	74.0%	4%
5	EB	55	12	19	11 - 20	47.8%	0%
	WB	65	12	20	1 – 10	45.6%	0%
6	EB	385	22	27	16 – 25	75.1%	2%
	WB	410	24	30	21 - 30	72.7%	11%

1. Based on data collected in October 2008.

2. ADT = Average Daily Traffic.

3. Represents the vehicles exceeding the posted speed limit by at least 5 mph. The posted speed limit is 25 mph.

As shown in Table 1, the ADT ranges from 55 at location 5 to 655 at location 1. These volumes are considered relatively low and are typical of residential neighborhood streets.

When evaluating vehicle speeds several measures should be considered to help determine if a speed problem exists. These measures include:

Average Speed – The mean speed for all locations is less than 25 mph with the exception of location 2 where the mean speed is 26 mph in the northbound direction and 29 mph in the southbound direction.

85th Percentile Speed – The 85th percentile speed is the speed in which 85 percent of the traffic is traveling at or below. Typically the 85th percentile speed should be within 5 – 10 mph of the posted speed.

All of the locations have an 85th percentile speed of 30 mph or less with the exception of one location. In the southbound direction of location 2 an advisory speed of 20 mph is posted and an 85th percentile speed of 34 mph is higher than desired.

10 mph Pace – The 10 mph pace is a measure of the range in speeds and is defined as the consecutive 10 mph range containing the highest number of vehicles.

All of the locations have a 10 mph pace that surrounds the speed limit with the exception of location 2 in the southbound direction where the 10 mph pace is between 26 and 35 mph.

Percent in Pace – When evaluating speed it is desirable to have the majority of vehicles within a small range of speed.

All of the locations show the majority of speeds within the 10 mph pace with the exception of location 5 with 47.8 percent in the eastbound direction and 45.6 percent in the westbound direction.

Percent of Vehicles Exceeding Speed Limit – this measure quantifies the number of vehicles traveling over the posted speed limit by at least 5 mph. As a general guideline, speeding along a roadway segment is an issue when more than 15 percent of the vehicles exceed the speed limit by at least 5 mph.

All of the locations are shown to have less than 15 percent of vehicles exceeding the speed limit with the exception of the southbound direction of location 2. At this location 35 percent of the vehicles are exceeding the speed limit by at least 5 mph. When considering the posted advisory speed of 20 mph at this location, 84 percent of the vehicles are exceeding the speed limit by at least 5 mph.

Based on the variety of speed indicators measured, the southbound direction of location 2 is the only location where speeding is of potential concern. Currently an advisory sign suggesting a speed of 20 mph is posted prior to the curve. The southbound direction at this location has a downhill grade with super elevation along the curve. A super elevated curve is banked and allows a vehicle to travel at higher speeds around the curve with less driver discomfort. There is also a green belt along the west side of the roadway that does not have any residential driveways, providing an added level of comfort for drivers as there are no potential conflicts for vehicles entering the roadway.

Measures to reduce travel speeds for Location 2 are described below in the Neighborhood Traffic Calming Plan section.

Collision Data

Collision data for the corridor was provided by the City of Burien and reviewed to identify if a high number of collisions have occurred or if collision patterns exist, indicating a safety problem. Historical collision data for the last 8 years (since 2000) shows that one collisions was reported within the study roadways. The collision was reported as a vehicle hitting a fixed object at the intersection of Shorewood Place SW / Shorecrest Drive SW. Having one collision along this corridor does not indicate a significant safety problem exists.

Neighborhood Traffic Calming

A neighborhood traffic calming plan can be considered when speeding problems occur as have been identified at Location 2. Typically, a two-phased approach to developing a neighborhood traffic calming plan is used when attempting to reduce vehicle speeds. The first phase includes measures such as education, enforcement, signage, or enhanced pavement markings. These are outlined in more detail below:

Education –Typically speeding in and through neighborhoods is from local residents themselves. Alerting and educating the residents within the neighborhood regarding the concerns or issues can occur at neighborhood meetings or through fliers. Many times this is effective as residents that frequently drive the same stretch of roadway become familiar and comfortable traveling at higher speeds and often don't realize how fast they are traveling.

Enforcement – Provide an enhanced police presence in the neighborhood and enforce the speed limits. This is often effective if speeding occurs on a regular basis at certain times of days. Then

speed patrols can be targeted during these times. There were no speeding trends or consistent time of day when speeding occurred in Goat Hill so this may not be an effective measure.

Enhanced signage – Enhancing or installing new signs in the affected area can be used to bring attention to areas of concern. This could include adding new advisory signs or enhancements such as orange flags to the existing signs.

Pavement markings – Pavement markings can be altered to visually narrow the roadway or caution drivers to drive at slower speeds. Drivers typically tend to drive slower when the roadway appears narrower.

If these measures are found to be ineffective, Phase two measures could be implemented, which would include more extensive physical measures such as speed humps, speed tables, traffic circles, chicanes, etc. These measures are typically more expensive and can only be used in specific locations where lighting, visibility and grades present a safe environment for vehicles to maneuver through these traffic calming measures.

Based on the topography near location 2, phase two measures would be difficult to implement due to the downhill grade, curvature of the roadway (limiting visibility), and lack of illumination.

Recommendations

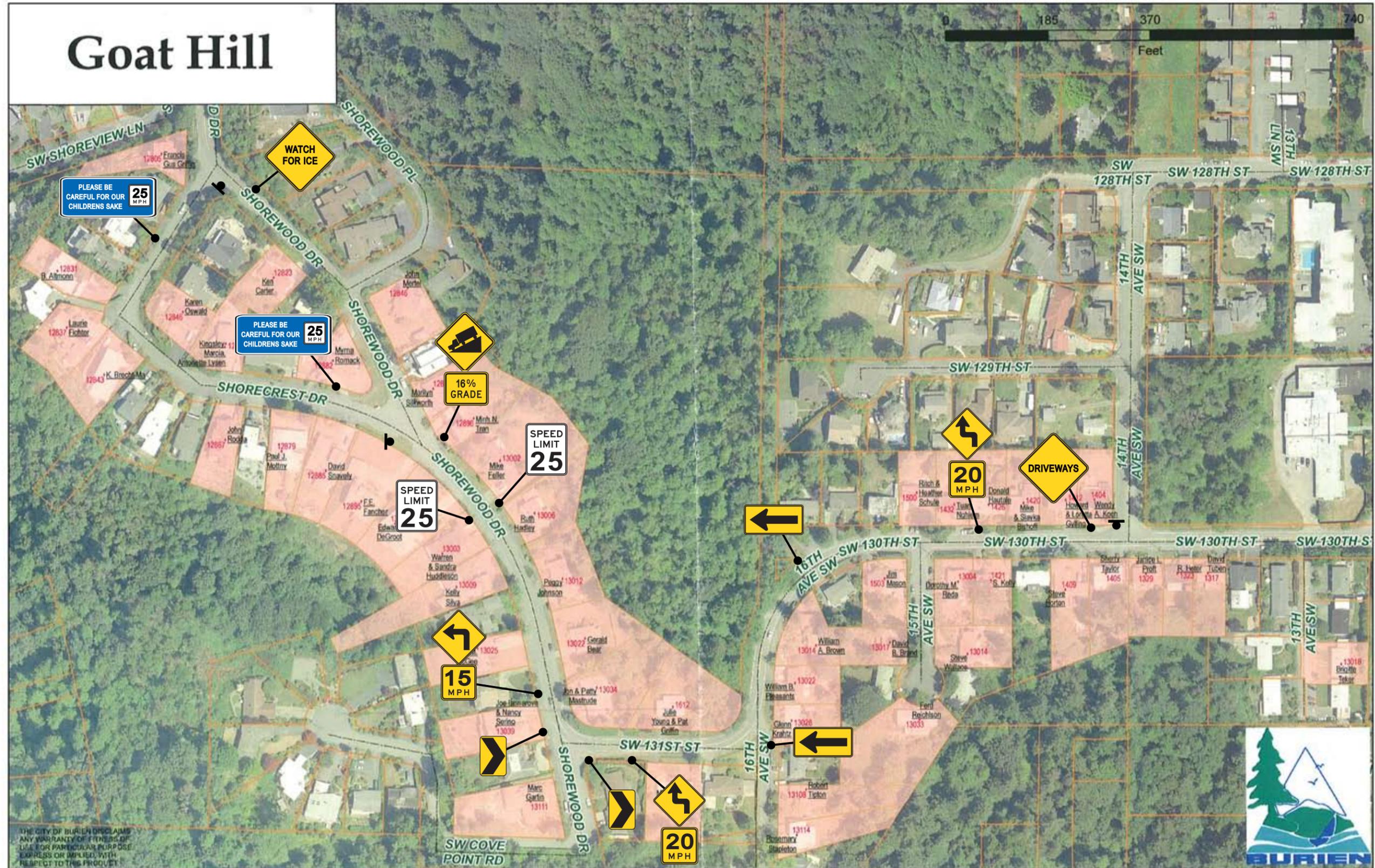
Speeding was only found to be an issue at one location along the corridor. Specifically, vehicles traveling in the southbound direction tend to travel faster most likely due to the combination of a downhill grade, a super elevated (slightly banked) curve, and lack of conflict points that make it comfortable for drivers to travel fast.

For this segment, we would recommend that phase one measures be implemented to try and address some of the speeding that occurs. This should include educating the neighborhood to the speeding concerns found by the local neighbors. This could occur during neighborhood meetings and/or through mailings identifying the concerns and requesting that drivers slow down and use caution through the neighborhood streets.

In addition to education, the City of Burien and the neighborhood may want to consider other measures such as restriping the travel lanes to provide a narrower look and feel, adding elevated rumble strips to the pavement to alert drivers, enhance the visibility of the speed limit and advisory signs with orange flags, or installing a radar speed sign that would flash at drivers when a vehicle travels over the speed limit.

These decisions should be made jointly between the residents of the neighborhood and City staff to ensure that the measures are in the best interests of all.

Goat Hill



Speed Advisory Sign Locations

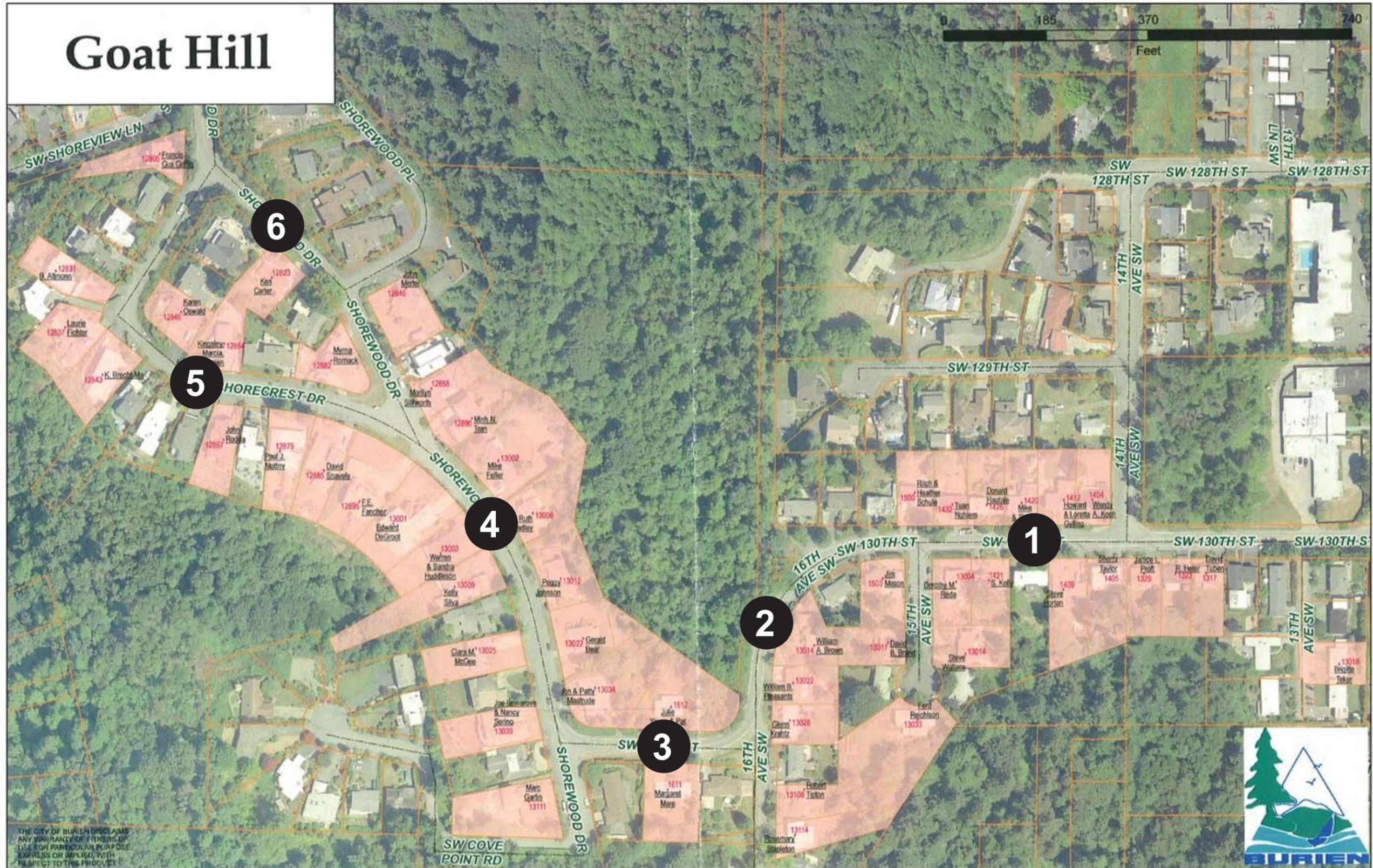
Burien-Goat Hill Speed Study

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FIGURE

1

Goat Hill



Note: Speed study locations are approximate.

Speed Study Locations

Burien-Goat Hill Speed Study

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FIGURE

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