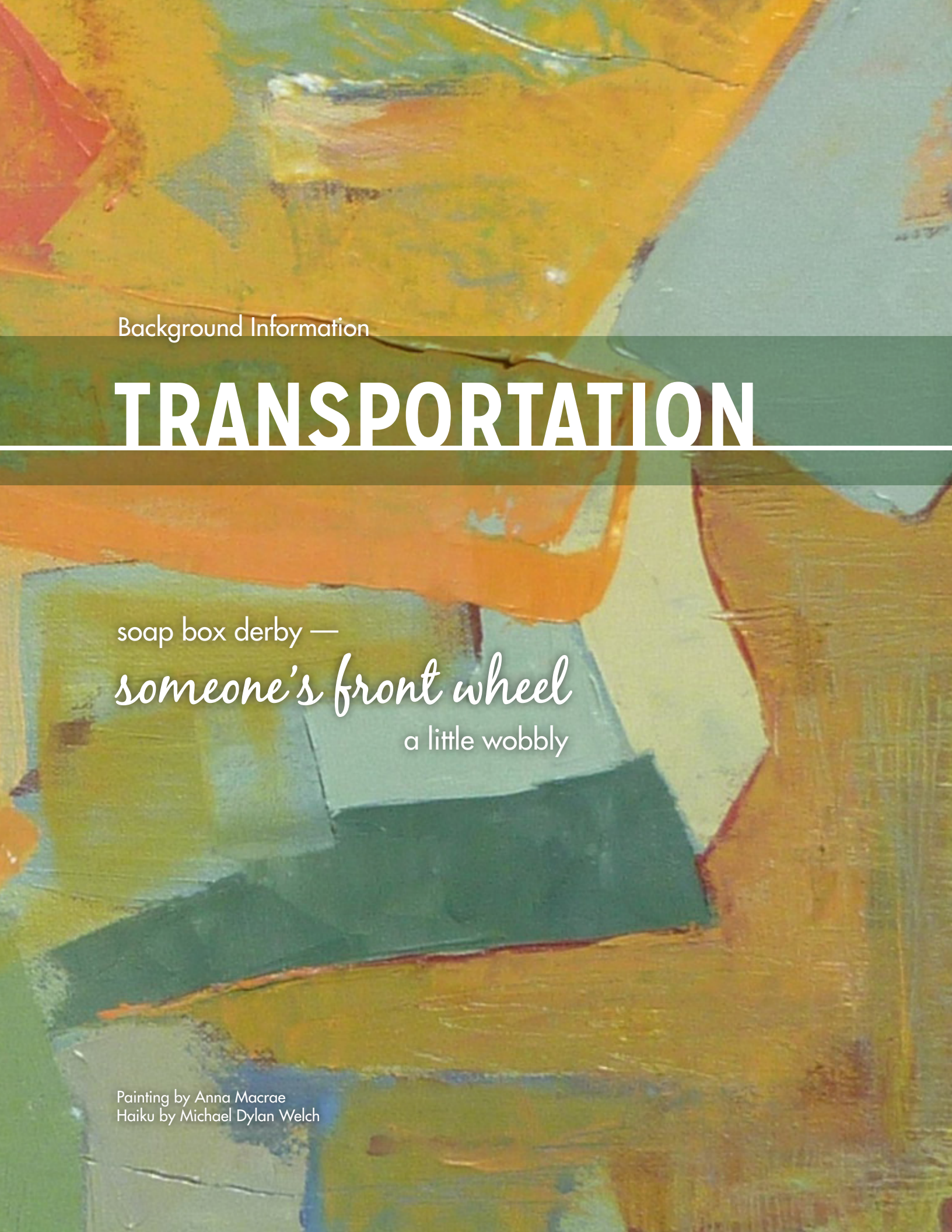


Background Information

TRANSPORTATION

soap box derby —
someone's front wheel
a little wobbly

Painting by Anna Macrae
Haiku by Michael Dylan Welch

Background Information

TRANSPORTATION

The purpose of the Transportation Element is to establish goals and policies that will guide the development of surface transportation in the City of Sammamish, in a manner consistent with the overall goals of the Comprehensive Plan. Based upon existing and projected land use and travel patterns, the Transportation Element Background Information addresses roadway classifications, levels of service, transit and non-motorized modes, future travel forecasts, transportation system improvements, financing strategies, and concurrency management. It establishes the technical basis for transportation system development, and for existing and future improvement of transportation programs and facilities guided by the Transportation Polices of the Comprehensive Plan.

Planning Context

The Plan's Transportation Element has been developed to be consistent with transportation policy and plans that have been adopted at the State and local levels, as described in the following sections.

State of Washington

Growth Management Act

Transportation planning at the State, County and local levels is mandated by the State of Washington Growth Management Act (GMA) [RCW 36.70A]. The GMA contains many requirements for the preparation of a Comprehensive Plan's Transportation Element. In addition to requiring consistency with the land use element, specific GMA requirements for a Transportation Element include [RCW 36.70A.070(6)]:

- Inventory of facilities by mode of transport.
- Level-of-service standards to aid in determining the existing and future operating conditions of the facilities.
- Proposed actions to bring deficient facilities into compliance with adopted level-of-service standards.
- Traffic forecasts, based upon land use.
- Identification of transportation infrastructure needs to meet current and future demands.
- Funding analysis for needed improvements, as well as possible additional funding sources.
- Identification of intergovernmental coordination efforts.
- Identification of transportation demand management strategies as available.
- Identification of improvements for pedestrian and bicycle facilities and corridors.

In addition to these elements, GMA mandates that development cannot occur unless infrastructure exists, infrastructure improvements or strategies are concurrent with development, or a financial commitment is in place to complete the improvements or strategies within six years. In addition to construction of new capital facilities, infrastructure may include transit service, ride share programs, transportation demand management (TDM) strategies, or transportation system management (TSM) strategies.

Washington Transportation Plan

The Washington Transportation Plan (WTP) 2030 presents the State of Washington's strategy for implementation programs and budget development over a 20-year planning horizon. The WTP contains an overview of the current conditions of the statewide transportation system, as well as an assessment of the State's future transportation investment needs. The WTP policy framework sets the course for meeting those future needs. The WTP is based on the following six transportation policy goals:

- Economic Vitality: To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy.
- Preservation: To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services;
- Safety: To provide for and improve the safety and security of transportation customers and the transportation system;
- Mobility: To improve the predictable movement of goods and people throughout Washington state;
- Environment: To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment; and
- Stewardship: To continuously improve the quality, effectiveness, and efficiency of the transportation system.

The WTP addresses the essential and interconnected roles of the Regional Planning Organizations and their local jurisdictions, and the important transportation issues of tribal governments in Washington State. It highlights the role of the Washington State Department of Transportation (WSDOT) to maintain, preserve and improve the transportation system while meeting the other societal goals defined above.

Puget Sound Region

Puget Sound Regional Council—*Transportation 2040*

Transportation 2040 is a 30-year action plan for transportation in the central Puget Sound Region (King, Pierce, Snohomish, and Kitsap Counties). The plan identifies investments to support growth and improve transportation services to people and businesses, provides a financing plan for funding transportation improvements, and proposes strategies for reducing environmental impacts. *Transportation 2040* establishes three integrated and sustainable strategies: congestion and mobility; environment; and funding. These three strategies are then broken into four major investment categories that pertain to maintaining existing services; enhancing safety and security; improving system efficiency through travel demand management (TDM); and implementing strategic capacity investments for all travel modes and facilities.

Transportation 2040 is an offshoot of the *Vision 2040* plan whose fundamental goal is to focus growth in urban areas to maintain and promote the well-being of people and communities, economic vitality, and a healthy environment (PSRC 2014).

King County

2012 King County Planning Policies

Supporting Growth

An effective transportation system is critical to achieving the Regional Growth Strategy and ensuring that centers are functional and appealing to the residents and businesses they are designed to attract.

> *Goal Statement: Local and regional development of the transportation system is consistent with and furthers realization of the Regional Growth Strategy.*

Mobility

Mobility is necessary to sustain personal quality of life and the regional economy. For individuals, mobility requires an effective transportation system that provides safe, reliable, and affordable travel options for people of all ages, incomes and abilities. While the majority of people continue to travel by personal automobile, there are growing segments of the population (e.g. urban, elderly, teens, low income, minorities, and persons with disabilities) that rely on other modes of travel such as walking, bicycling, and public transportation to access employment, education and training, goods and services.

The movement of goods is also of vital importance to the local and regional economy. International trade is a significant source of employment and economic activity in terms of transporting freight, local consumption, and exporting of goods.

> *Goal Statement: A well-integrated, multi-modal transportation system transports people and goods effectively and efficiently to destinations within the region and beyond.*

System Operations

The design, management and operation of the transportation system are major factors that influence the region's growth and mobility.

> *Goal Statement: The regional transportation system is well-designed and managed to protect public investments, promote public health and safety, and achieve optimum efficiency.*

King County Metro Strategic Plan for Public Transportation 2011–2021

The King County Strategic Plan for Public Transportation 2011–2021 describes a vision for the county's future transportation system and sets objectives, goals, and strategies for getting there. The plan is consistent with other regional and countywide policies and plans, such as *Vision 2040*. Strategies to achieve Metro's goals are as follows:

- Increase safety and security in public transportation operations and facilities.
- Increase travel opportunities and public transportation products to serve appropriate markets (including low-income, elderly, and students) and mobility needs.
- Provide travel options and alternatives to regular fixed route-transit, such as ridesharing and other alternative or "right-sized" services.
- Expand services to account for the region's growing population and serve new transit markets.
- Support CTR and TDM strategies for employers, local jurisdictions, and other agencies.
- Enhanced service to and within jurisdictions that aggressively implement local land use plans, growth management strategies, and transit-oriented development.
- Design and modification of services and infrastructure to be more efficient and effective.
- Coordinate with Sound Transit, Community Transit, Pierce Transit, and the Washington State Ferry System to provide integrated efficient service to major destinations throughout the region.
- Improve access for pedestrians (with and without disabilities) and bicyclists, as well as the waiting environment at transit facilities with the highest use.
- Provide service that is easy to understand and use and promote. (King County Metro 2013)

Sound Transit

Sound Transit 2 expands mass transit with the addition of more regional express transit and link light rail and commuter rail service. This second mass transit phase builds onto the Sound Move strategic program, approved by voters in 1996. Sound Transit 2 expands the link light rail system to include link light rail from North Seattle into Snohomish County (Sound Transit 2008).

Inventory and Existing Conditions

The primary objective of this section of the report is to assess existing traffic conditions within and adjacent to the City of Sammamish. In order to identify existing traffic conditions, a comprehensive data collection process has been undertaken. The data was primarily collected from the City of Sammamish, King County, and WSDOT. The assessment of existing conditions serves as a baseline for measurement of capacity for future land use and transportation planning.

The following categories are included in this section:

- Identification of State Highways;
- Roadway Inventory;
- Traffic Signal Inventory;
- Roadway Design Standards;
- Traffic Level-of-Service Analysis;
- Analysis of Access to the city;
- Traffic Calming;
- Current Six-Year Transportation Improvement Program (TIP);
- Existing Transit Service; and
- Existing Non-Motorized Conditions.

Identification of State Highways

Identification of State Highways

No state highways are located within Sammamish city limits. However, three State-controlled highways, Interstate 90 (I-90), State Route 520 (SR 520), and State Route 202 (SR 202), run near or adjacent to Sammamish, providing the primary means of access into and out of the city. Improvements on these facilities will highly impact traffic conditions in Sammamish and in turn, conditions on the highways will be impacted by transportation conditions and improvements in Sammamish.

I-90 is a limited-access freeway that consists of three lanes in each direction and runs east-west, approximately one mile south of the southern Sammamish city limits. From just west of Issaquah to Seattle, I-90 also has an HOV lane in each direction. I-90 serves as the primary east-west freeway for regional travel within and beyond western Washington. To the west, it provides direct connection to the Cities of Bellevue, Mercer Island, and Seattle. To

the east, it serves as the major east-west freeway across the State of Washington, connecting to Spokane at the eastern state border, and running beyond to the eastern coast of the United States.

SR 520 is a limited access freeway that consists primarily of two to three lanes in each direction and runs east west between the Cities of Redmond, Bellevue and Seattle. There are HOV lanes present along various stretches of this highway, but these lanes are not continuous.

SR 202, which runs adjacent to the northern Sammamish city limits, connects to SR 520 west of the city. SR 202 (also called Redmond-Fall City Road in the area adjacent to Sammamish) consists of one lane in each direction, widening to two lanes in each direction west of Sahalee Way. SR 520/SR 202 is the primary east-west highway alternative to I-90. This highway corridor provides direct connection to the Cities of Redmond, Bellevue, Kirkland, and Seattle to the west, and to the Cities of Snoqualmie and North Bend to the east.

Both I-90 and SR 520 connect directly to Interstate 405 (I-405) and Interstate 5 (I-5) to the west, which are the primary north-south freeways within the region.

Highways of Statewide Significance

In 1998, Highways of Statewide Significance (HSS) legislation was passed by the Washington State Legislature and codified as RCW 47.06.140. Highways of Statewide Significance are those facilities deemed to provide and support transportation functions that promote and maintain significant statewide travel and economic linkages. The legislation emphasizes that these significant facilities should be planned from a statewide perspective (WSDOT 2004). Thus, level-of-service requirements for HSS highways are established by WSDOT, not by local standards.

Adjacent to the City of Sammamish, I-90 carries the HSS designation (Washington State Transportation Commission 2004) and thus is controlled by State level-of-service requirements. Additionally, SR 520 is also identified as an HSS.

Roadway Inventory

Roadway Functional Classification and Inventory

Transportation roadway systems consist of a hierarchy of streets that provide the dual functions of access to land and development, and

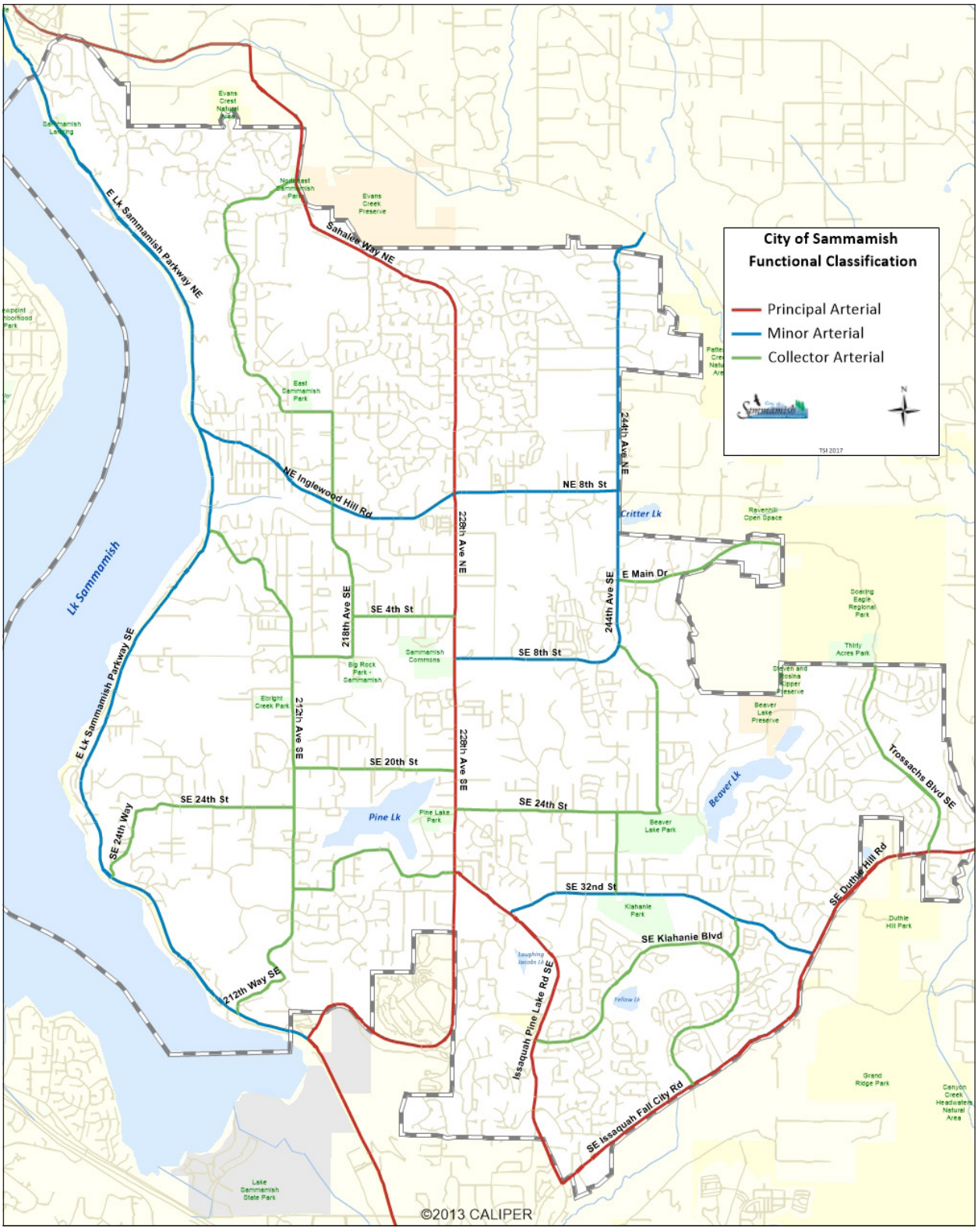
through movement for travelers. Streets are classified based upon the relative degree to which they provide these functions. Land use policies and street standards typically vary according to the street function. For example, most jurisdictions designate minimum right-of-way requirements, stopping and entering sight distances, roadway width, design speed, design traffic volumes, access control, and sidewalk requirements in accordance with an adopted classification system. These requirements are usually codified in the jurisdiction's municipal code and/or adopted as street standards.

Based on state law, cities and counties are required to adopt a street classification system that is consistent with state and federal guidelines. In the State of Washington, these requirements are codified in RCW 35.78.010 and RCW 47.26.090. Each local jurisdiction is responsible for defining its transportation system into the following functional classifications: freeway, principal arterial, minor arterial, and collector. All other roadways are assumed to be local access streets.

Background Figure T–1 shows the existing classification of roadways for the City of Sammamish. The classifications are summarized as follows:

- **Freeways/Interstates** are multi-lane, high-speed, high-capacity roadways intended exclusively for motorized traffic. All access is controlled by interchanges and bridges separate road crossings. While I-90 to the south and SR 520 to the northwest are classified as freeways, no roadways of this designation exist within the city limits.
- **Principal Arterials** are roadways connecting between major community centers and facilities, and are often constructed with limited direct access to abutting land uses. Principal arterials serve high-volume corridors, carrying the greatest portion of through or long-distance traffic within a city. The selected routes should provide an integrated system for complete circulation of traffic, including ties to the major rural highways entering the urban area. There is an estimated 11 miles of principal arterial roads in the city. The following is a list of roadways currently designated as principal arterials in the City of Sammamish:
  - Sahalee Way NE, between 228th Ave NE and the north city limits;
  - 228th Ave, between SE 43rd Way and Sahalee Way NE;
  - SE 43rd Way, between the south city limits and 228th Ave SE;
  - Issaquah-Pine Lake Rd SE, between city limits and 228th Ave SE;

Background Figure T–1
Existing Roadway Inventory and Functional Classifications



  - SE Issaquah-Fall City Rd, between city limits and SE Duthie Hill Rd; and
  - SE Duthie Hill Rd, between Issaquah-Fall City Rd and the east city limits.

- **Minor Arterials** are roadways connecting centers and facilities within the community and serving some through traffic, while providing a greater level of access to abutting properties. Minor arterials connect with other arterial and collector roads extending into the urban area, and serve less concentrated traffic-generating areas, such as neighborhood shopping centers and schools. These road also serve as boundaries to neighborhoods and collect traffic from collector streets. Although the predominant function of minor arterial streets is the movement of through traffic, they also provide for considerable local traffic with origins or destinations at points along the corridor. The following is a list of roadways currently designated as minor arterials in the City of Sammamish:
  - E Lake Sammamish Pkwy, between the south city limits and the north city limits;
  - NE Inglewood Hill Rd, between E Lake Sammamish Pkwy and 228th Ave NE;
  - NE 8th St, between 228th Ave NE and 244th Ave NE;
  - SE 8th St, between 228th Ave SE and 244th Ave SE;
  - 244th Ave NE, between SE 8th St and E Main Dr;
  - 244th Ave SE, between SE 8th St and the north city limits;
  - SE 32nd Way/SE 32nd St-SE Issaquah Beaver Lk Rd, between Issaquah-Pine Lake Rd SE and SE Issaquah-Fall City Rd/SE Duthie Hill Rd.

- **Collector Arterials** are roadways that connect two or more neighborhoods or commercial areas, while also providing a high degree of property access within a localized area. These roadways "collect" traffic from local neighborhoods and carry it to the arterial roadways. Additionally, collector arterials provide direct access to services and residential areas, local parks, churches and areas with similar uses of the land. Collector arterials may be separated into principal and minor designations according to the degree of travel between areas and the expected traffic volumes. The following is a list of roadways currently designated as collector arterials in the City of Sammamish:

- NE 37th Way-205th Pl NE/NE 16th St, between Sahalee Way NE and 216th Ave NE;
- 216th Ave NE, between NE Inglewood Hill Rd and NE 16th St;
- Louis Thomson Rd, between 212th Ave SE and East Lake Sammamish Pkwy NE;
- 212th Ave, between E Lk Sammamish Pkwy SE and Louis Thomson Rd;
- SE 8th St, between 212th Ave SE and 218th Ave SE;
- 218th Ave SE, between SE 8th St and SE 4th St;
- SE 4th St, between 218th Ave SE and 228th Ave SE;
- 248th Ave SE, between SE 24th St and SE 14th St;
- E Main Dr, between 244th Ave SE and the east city limits;
- SE 20th St, between 212th Ave SE and 228th Ave SE;
- SE 24th Way/SE 24th St, between E Lk Sammamish Pkwy SE and 212th Ave SE;
- SE 24th St, between 228th Ave SE and 248th Ave SE;
- Trossachs Boulevard SE, between SE Duthie Hill Rd and the north city limits;
- SE Windsor Blvd, between SE 8th St and SE 14th St;
- South Pine Lake Route (SE 32nd St-216th Ave SE-SE 28th St-222nd Pl SE-SE 30th St), between 212th Ave SE and 228th Ave SE;
- 244th Ave SE, between SE 24th St and SE 32nd St;
- SE Klahanie Blvd/Klahanie Dr SE, between Issaquah-Pine Lake Rd SE and SE Issaquah-Fall City Rd;
- 256th Ave SE, between SE Issaquah-Beaver Lake Rd and SE Klahanie Blvd; and
- 218th Ave SE-217th Ave NE-216th Ave NE, between SE 4th St to Inglewood Hill Rd.

Background Table T–1 provides a comparison of the City of Sammamish arterial and collector roadway miles to Federal Highway Administration (FHWA) guidelines (FHWA 1989), which must be followed to qualify the City of Sammamish streets for State and Federal grant programs.

The topography and development patterns within the City of Sammamish limit opportunities to add Principal or Minor Arterial routes. Some additional Collector mileage could be added and the totals would still remain within the FHWA guidelines.

Background Table T–1
Miles of Roadway by Functional Classification

FUNCTIONAL CLASSIFICATION	EXISTING MILES OF ROADWAY IN SAMMAMISH[1]	TYPICAL RANGE OF PERCENTAGE OF TOTAL ROADWAY[2]	TYPICAL RANGE OF MILES BASED UPON FHWA GUIDELINES
Freeway & Principal Arterial	14	5%–10%	10–20
Minor Arterial	16	10%–15%	16–24
Collector Arterial	21	5%–10%	8–16
Non-Arterial Street	157	—	135–167
TOTAL	208	—	207

Traffic Signal and Roundabout Intersection Inventory

An inventory of the signalized and roundabout intersections, and those with four way flashers within and nearby the City of Sammamish was conducted. The locations are illustrated in Background Figure T–2, and are the intersections that most directly affect City of Sammamish residents' travel patterns.

Freight Routes

See Volume I, Transportation Element Policy T.1.5 on page 86.

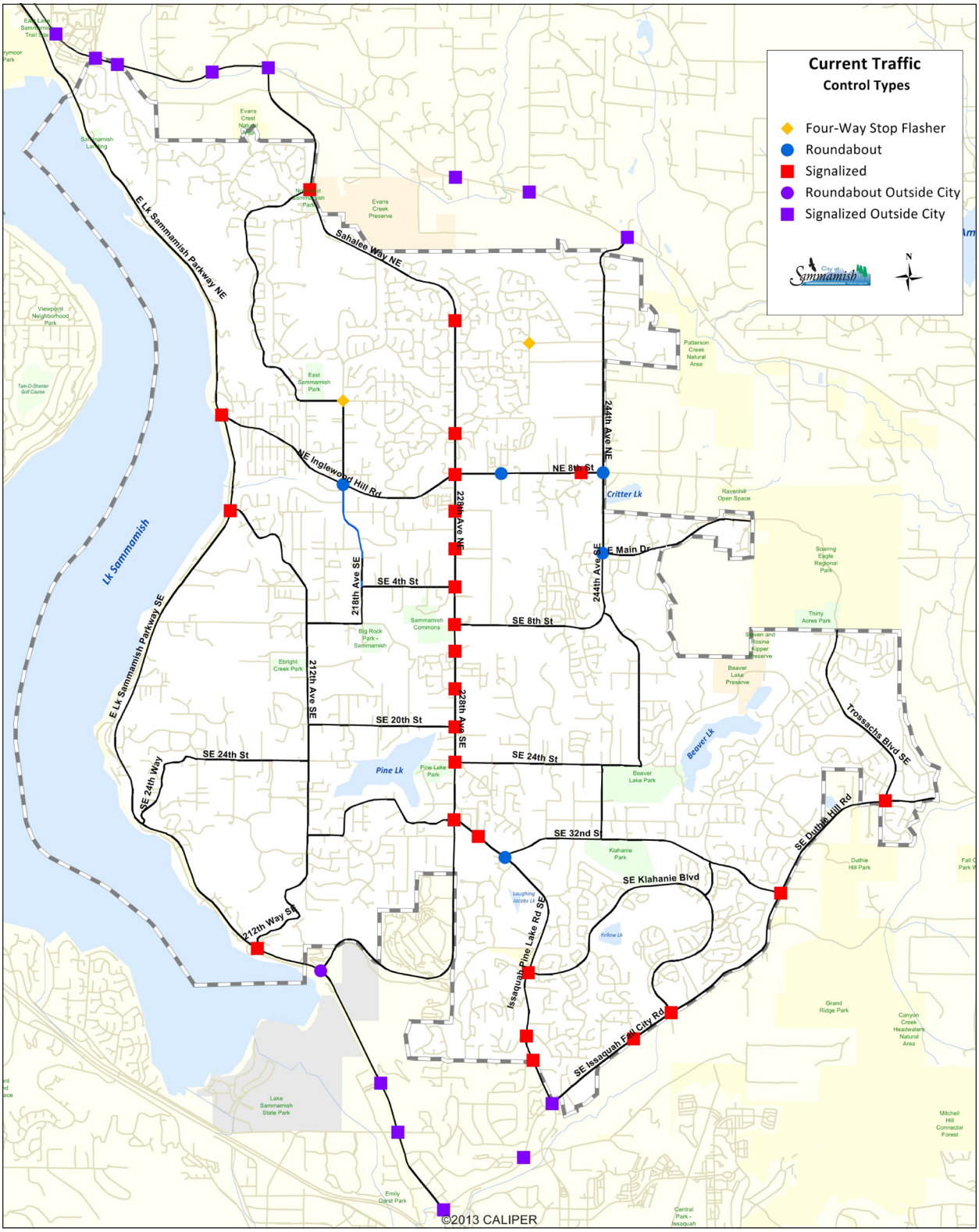
Freight destined to and from Sammamish is associated primarily with retail oriented commercial developments in the city. There are no significant industrial, manufacturing, or import/export freight generators in the city. Limited through freight associated with FedEx sorting facilities in Issaquah to the south and UPS sorting facilities in Redmond to the north travel through the city. Freight traffic uses two corridors. Through freight typically uses East Lake Sammamish Parkway and local freight traffic uses Sahalee Way/228th Ave. Background Figure T–3 shows these routes.

See Volume I, Transportation Element Policy T.3.4 on page 90.

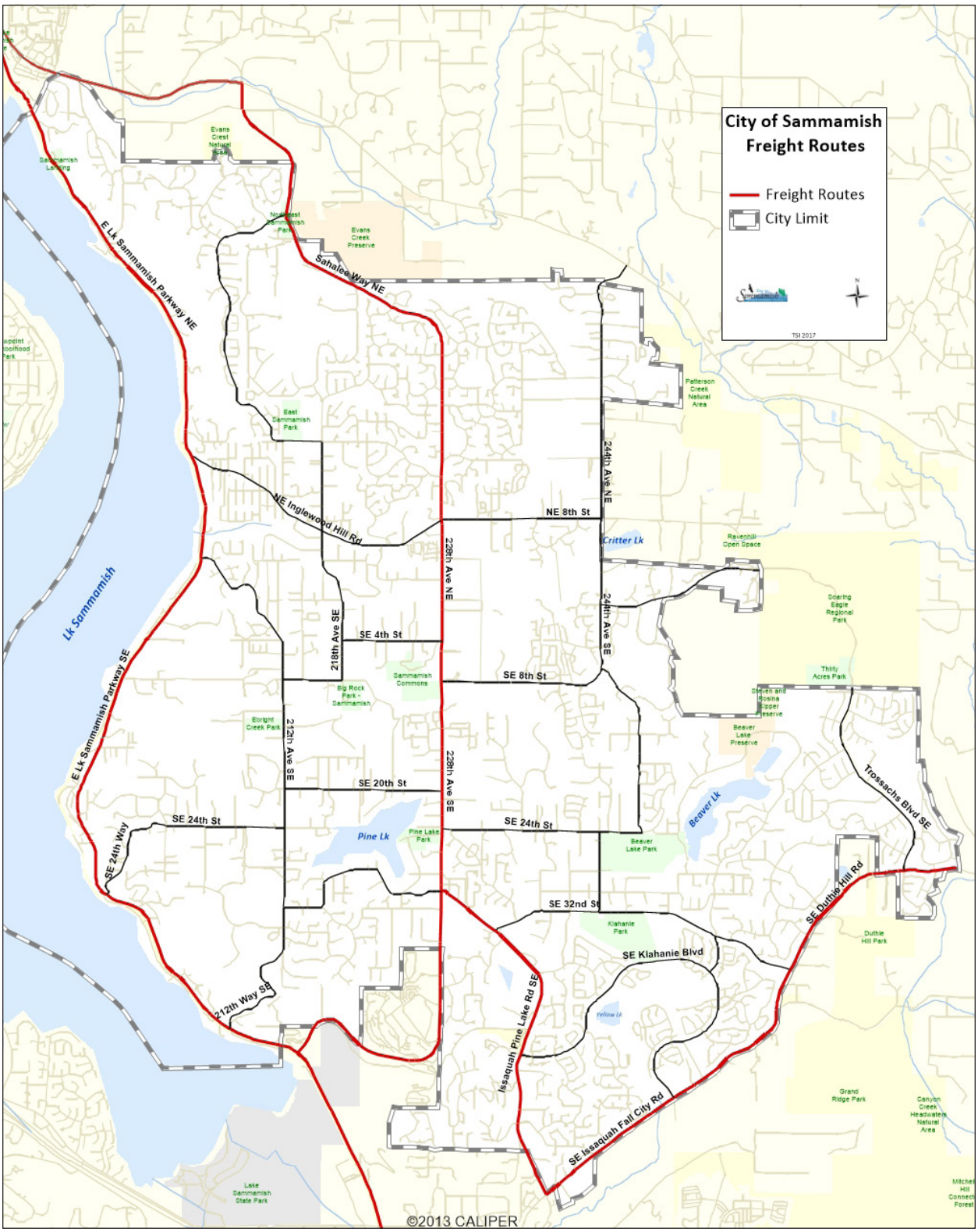
Roadway Design Standards

The City has adopted standards for development of City streets, as documented in the *2016 Public Works Standards* (December 31, 2016). As the city reconstructs roadways to improve vehicular capacity and safety, they will become more urban in nature. The Goals, Objectives and Policies of the Transportation Element relate street design to the desires of the local community, and advise that design be at a scale commensurate with the function that the street serves. Guidelines are therefore important to provide designers with essential elements of street design as desired by the community.

Background Figure T–2
2016 Signal, Roundabout, and Four-Way Flasher Locations



Background Figure T–3
Freight Routes



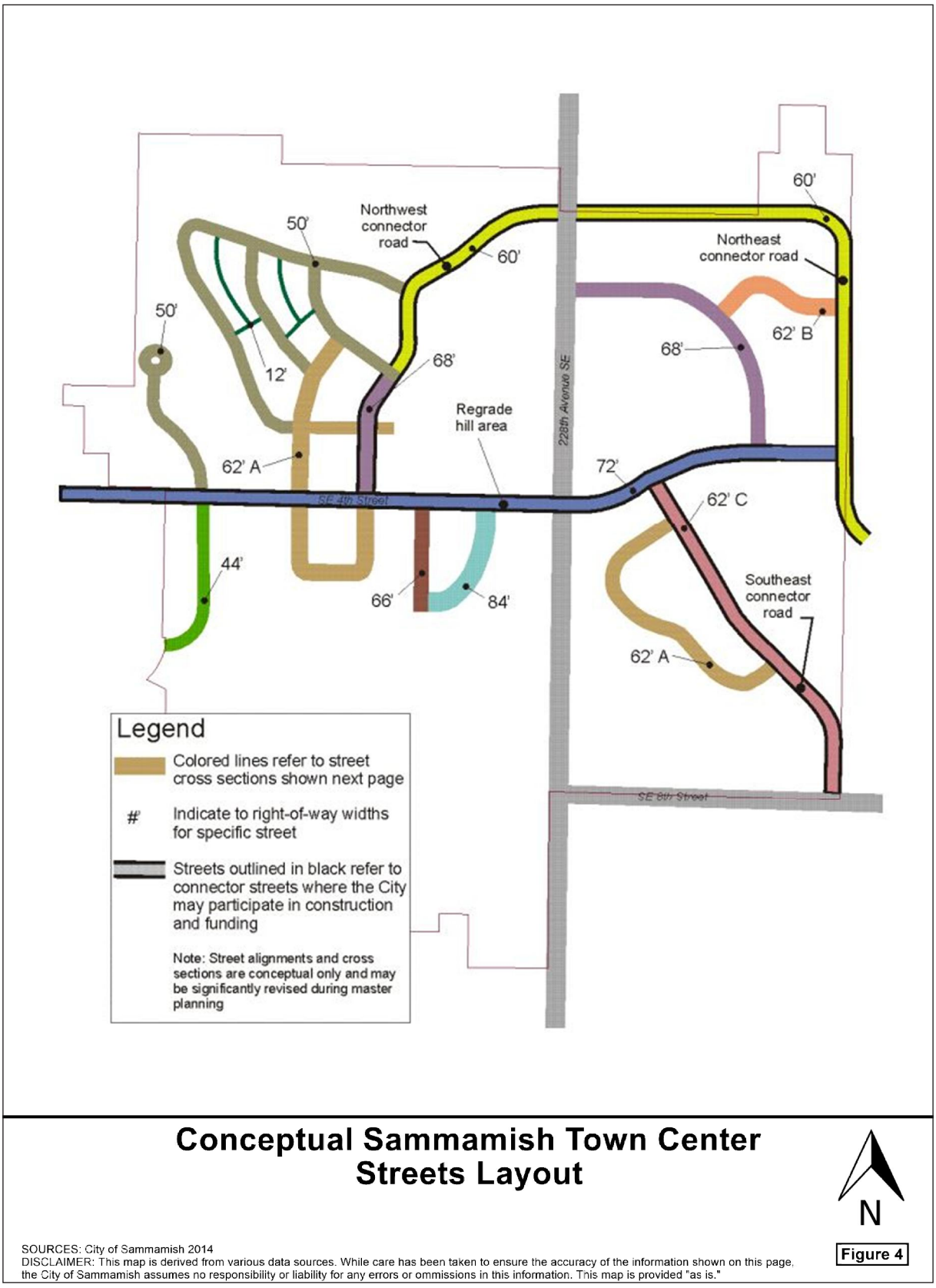
In June 2008, the City of Sammamish adopted the Sammamish Town Center Plan. The Town Center Plan established policy direction that amends the previous Comprehensive Plan. The Town Center provides a central area for the increased residential and commercial densities. Transportation improvements associated with the Town Center are intended to provide safe, efficient and attractive connections to central uses and amenities, minimize congestion impacts within the Town Center and surrounding areas, and promote alternative travel modes. To support the Town Center Plan improvement concepts including roadway cross-sections specific to roadways supporting the Town Center were developed. Background Figure T–4 and Background Figure T–5 illustrate the conceptual Sammamish Town Center street cross-sections (Sammamish Town Center Plan June 2008).

Traffic Counts

Daily traffic counts were collected in 2016 at 74 locations throughout the city. Average weekday daily traffic (AWDT) counts were calculated by averaging the daily traffic counts of Monday, Tuesday, Wednesday, Thursday, and Friday during a typical week. Locations and volumes for existing AWDTs are listed in Background Table T–2 and illustrated in Background Figure T–6. The highest traffic volumes shown occur near 228th Ave SE/SE 10th Street and 228th Ave SE/SE 20th Street.

In addition, intersection turning movement counts were collected at 43 locations during the AM and PM peak hours within the city in 2016. These counts were collected during a Tuesday and Thursday in April and May, in order to reflect typical weekday conditions. These counts consider vehicle traffic volumes making each turn movement during the AM and PM peak hours. These counts are collected manually and are further described in the following section.

Background Figure T–4
Sammamish Town Center Plan Roadway Locations



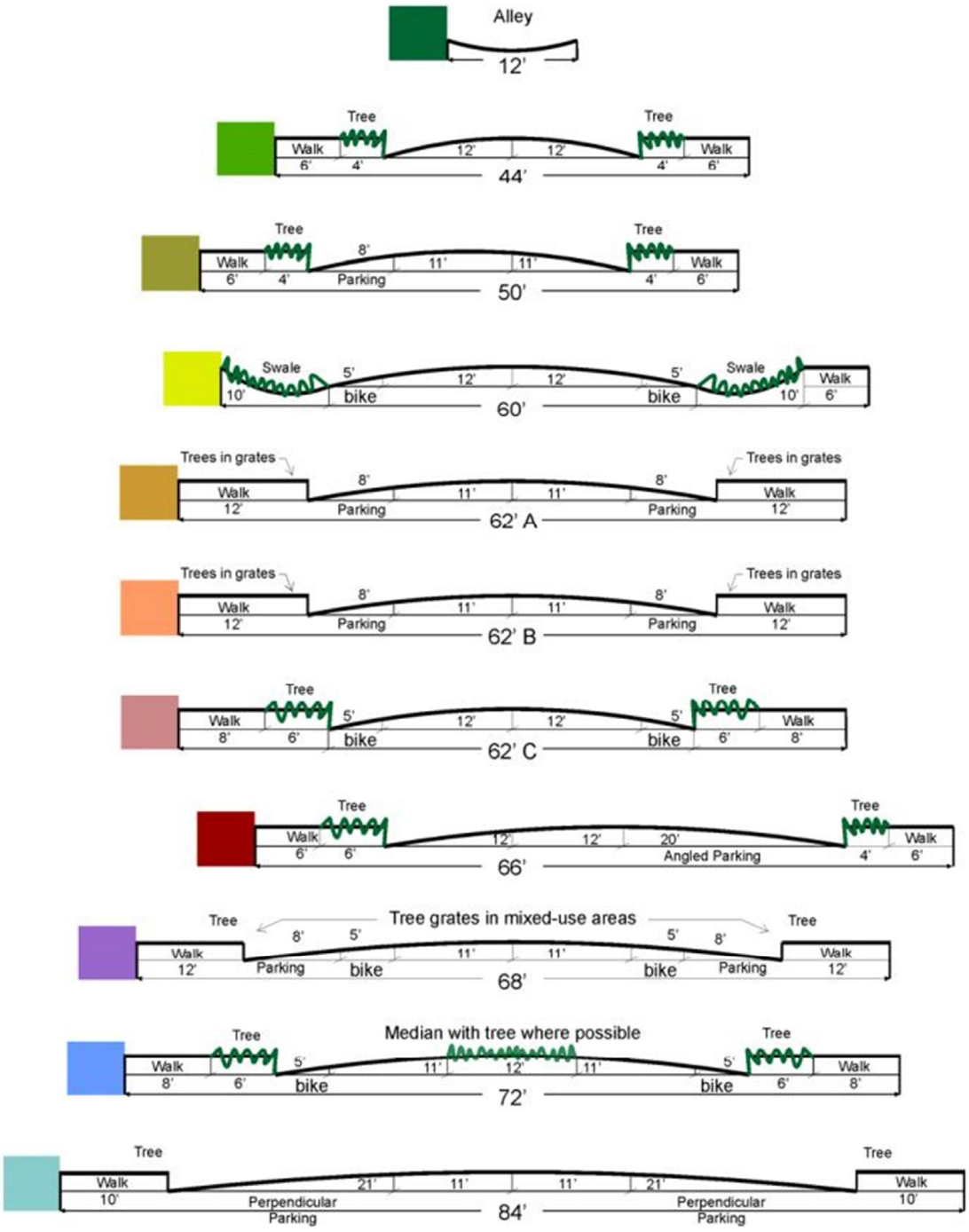
Conceptual Sammamish Town Center Streets Layout

N

SOURCES: City of Sammamish 2014
DISCLAIMER: This map is derived from various data sources. While care has been taken to ensure the accuracy of the information shown on this page, the City of Sammamish assumes no responsibility or liability for any errors or ommissions in this information. This map is provided "as is."

Figure 4

Background Figure T–5
Sammamish Town Center Plan Roadway Standards



Conceptual Sammamish Town Center Street Cross-Section

SOURCES: City of Sammamish 2014
DISCLAIMER: This map is derived from various data sources. While care has been taken to ensure the accuracy of the information shown on this page, the City of Sammamish assumes no responsibility or liability for any errors or ommissions in this information. This map is provided "as is."

Figure 5

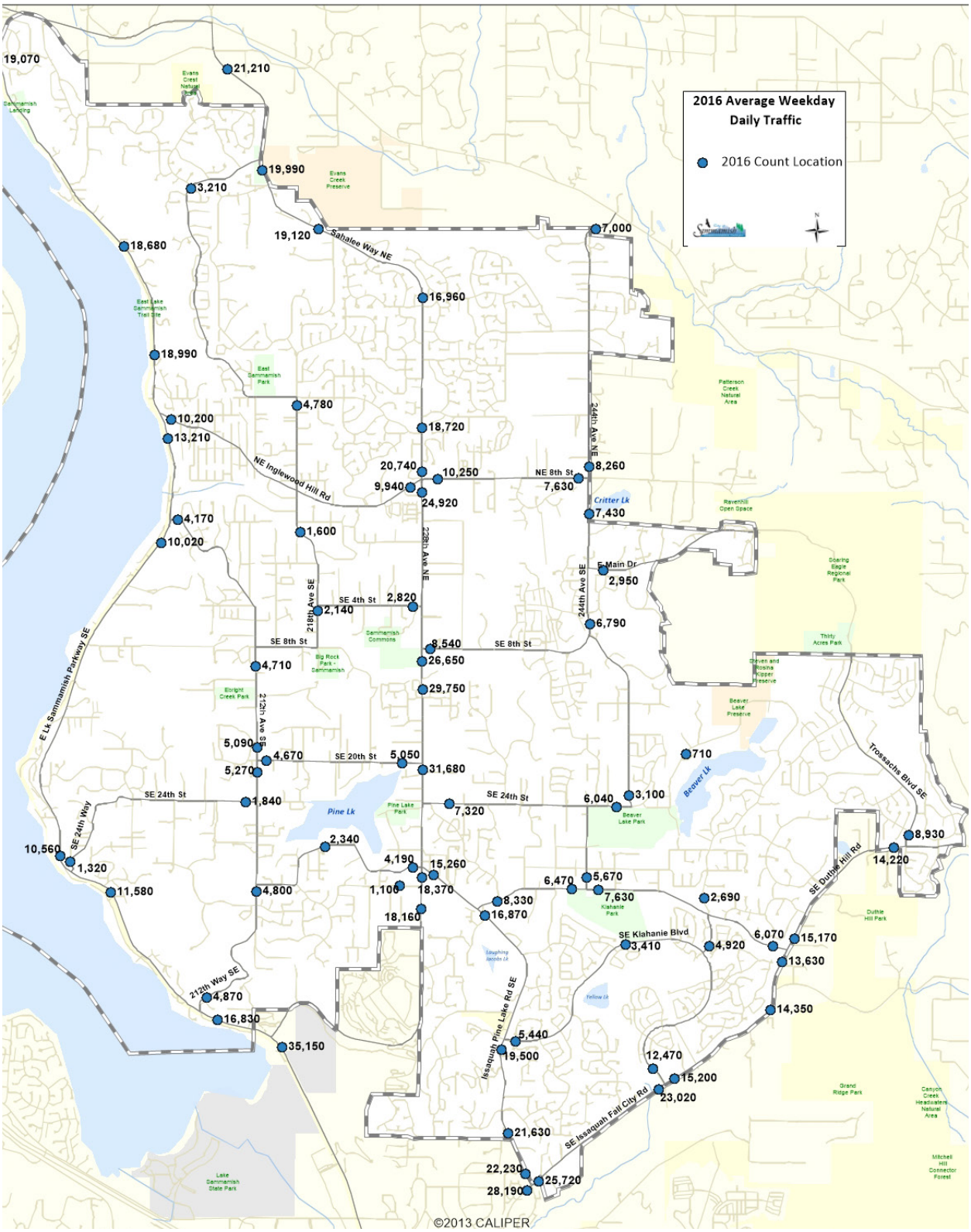
Background Table T–2
2016 Average Weekday Daily Traffic (AWDT)

	LOCATION	2016 AWDT
1	East Lake Sammamish Parkway NE, south of 187th Avenue NE	19,070
2	Sahalee Way SE, south of NE 50th Street	21,210
3	244th Ave NE, south of SR-202	7,000
4	East Lake Sammamish Parkway SE, south of Louis Thompson Road	10,020
5	212th Avenue SE, south of SE 8th Street	4,710
6	228th Avenue SE, south of SE 10th Street	29,750
7	East Lake Sammamish Parkway, south of 212th Avenue SE	16,830
8	228th Avenue SE, south of SE 32nd Street	18,160
9	Issaquah-Pine Lake Road, east of 228th Avenue SE	15,260
10	244th Avenue SE, north of SE 32nd Street	5,670
11	Beaver Lake Drive SE, north of Issaquah-Beaver Lake Road	2,690
12	SE Duthie Hill Road, north of Issaquah-Beaver Lake Road	15,170
13	East Lake Sammamish Parkway, south of SE 43rd Way	35,150
14	Issaquah-Fall City Road, southwest of Issaquah-Pine Lake Road	28,190
15	Issaquah-Pine Lake Road, south of SE Klahanie Boulevard	19,500
16	Trossachs Boulevard SE, north of SE Duthie Hill Road	8,930
17	East Lake Sammamish Parkway, south of NE Inglewood Hill Road	13,210
18	East Lake Sammamish Pkwy, north of NE 18th Place	18,990
19	East lake Sammamish Parkway, south of SE 32nd Street	11,580
20	NE Inglewood Hill Road, east of East Lake Sammamish Parkway	10,200
21	NE 8th Street, east of 228th Avenue NE	10,250
22	228th Avenue NE, north of NE 8th Street	20,740
23	228th Avenue NE, south of NE Inglewood Hill Road/NE 8th Street	24,920
24	228th Avenue SE, south of SE 8th Street	26,650
25	212th Avenue SE, south of SE 20th Street	5,270
26	228th Avenue SE, south of Issaquah-Pine Lake Rd	18,370
27	SE 20th Street, west of 228th Avenue SE	5,050
28	SE 28th Street, east of 218th Avenue SE (South Pine Lake Route)	2,340
29	SE 8th Street, east of 228th Ave SE	8,540
30	SE 24th Street, east of Audubon Park Drive	7,320
31	244th Avenue SE, north of SE Windsor Boulevard	6,790
32	East Main Drive, east of 244th Avenue SE	2,950
33	244th Avenue NE, north of NE 8th Street	8,260
34	NE 8th Street, west of 244th Avenue NE	7,630
35	South Pine Lake Route (Issaquah-Pine Lake Rd ext), west of 228th Ave SE	4,190
36	West Beaver Lake Drive SE, south of SE 18th Place	710
37	205th Place NE, south of NE 37th Way	3,210

Background Table T–2
2016 Average Weekday Daily Traffic (AWDT) (cont.)

	LOCATION	2016 AWDT
38	SE 4th Street, west of 228th Avenue SE	2,820
39	248th Avenue SE, north of SE 24th Street	3,100
40	244th Ave NE, north of NE 3rd Way (on bridge)	7,430
41	216th Avenue NE, south of NE 16th Street	4,780
42	217th Avenue NE, south of NE 4th Street	1,600
43	218th Avenue SE, south of SE 4th Street	2,140
44	Louis Thompson Road NE, east of East Lake Sammamish Parkway NE	4,170
45	212th Way SE, east of East Lake Sammamish Parkway SE	4,870
46	SE 32nd Street, west of 228th Avenue SE	1,100
47	SE 32nd Street, west of 244th Avenue SE	6,470
48	SE Issaquah-Beaver Lake Road, west of SE Duthie Hill Road	6,070
49	SE 32nd Street, east of 244th Avenue SE	7,630
50	SE Duthie Hill Road, south of SR-202	7,530
51	East Lake Sammamish Parkway NE, south of NE 30th Street	18,680
52	East Lake Sammamish Parkway SE, north of SE 24th Way	10,560
53	SE 24th Way, east of East Lake Sammamish Parkway SE	1,320
54	212th Avenue SE, north of SE 20th Street	5,090
55	212th Avenue SE, south of SE 32nd Street	4,800
56	SE 20th Street, east of 212th Avenue SE	4,670
57	Sahalee Way NE, north of NE 25th Way	16,960
58	228th Avenue NE, north of NE 12th Place	18,720
59	228th Avenue SE, south of SE 20th Street	31,680
60	Issaquah-Pine Lake Road, south of SE 32nd Way	16,870
61	Issaquah-Pine Lake Road SE, north of SE 48th Street	21,630
62	SE 32nd Way, east of Issaquah-Pine Lake Road SE	8,330
63	SE Klahanie Boulevard, east of Issaquah-Pine Lake Road SE	5,440
64	SE 24th Street, west of 244th Avenue SE	6,040
65	SE Issaquah-Fall City Road, northeast of Issaquah-Pine Lake Road SE	25,720
66	SE Issaquah-Fall City Road, west of Klahanie Drive SE	23,020
67	SE Issaquah-Fall City Road, east of Klahanie Drive SE	15,200
68	Klahanie Drive SE, north of SE Issaquah-Fall City Road	12,470
69	SE Klahanie Boulevard, northeast of SE 37th Street	3,410
70	SE Issaquah-Fall City Road, south of SE Duthie Hill Road	14,350
71	SE Duthie Hill Road, south of SE Issaquah-Beaver Lake Road	13,630
72	SE Duthie Hill Road, west of Trossachs Boulevard SE	14,220
73	Sahalee Way NE, south of NE 37th Way	19,990
74	Sahalee Way NE, south of 217th Place NE	19,120

Background Figure T–6
2016 Average Weekday Daily Traffic



Traffic Intersection Operations Models

The City uses the Synchro and SIDRA software programs to analyze intersection operations. These models are leading traffic capacity software programs used to analyze signalized, stop-controlled, and roundabout intersections, and they support the methodologies recommended by the Highway Capacity Manual.

Model outputs are used to evaluate concurrency, predict intersection capacity and delays, inform signal timing plan options to optimize intersection operations, and evaluate potential solutions for a failing intersection. Notwithstanding these uses, there are limitations to the use of these models, including their accuracy in predicting delays and queues when the backup is caused by a downstream intersection; andas well as accurately measuring delays when intersections are overcapacity.

Traffic Level-of-Service Analysis

See Volume I, Transportation Element Policy T.1.3 on page 86.

Level-of-Service (LOS) is the primary measurement used to determine the operating condition of an intersection. LOS is determined by the average delay of all approaches for signalized, roundabouts (RAB), and all way stop-controlled intersections. The LOS for side-street stop-controlled intersections is determined by the average delay for the worst minor approach, or left turn movement of the major street. The following section describes the traffic counts volumes that were collected, the approaches used for intersection LOS analysis, and the results of the analyses under existing conditions.

The Highway Capacity Manual (HCM) is the recognized source for the techniques used to measure transportation facility performance. Using the HCM procedures, the quality of controlled intersection operations is graded into one of six levels-of-service: A, B, C, D, E, or F.

Intersection Level of Service

The intersection level of service (LOS) is calculated using the standard analysis procedures described in this section for the AM and PM peak hours. Intersections with LOS' below the defined standards will be considered deficient. For intersections of roadways with different functional classifications, the standard for the higher classification applies to the entire intersection.

The intersection LOS standards adopted in this Transportation Element are LOS C for intersections that include Minor Arterial or Collector Arterial roadways, and LOS D or E for intersections that include Principal Arterials. Attaining LOS D at major intersections with high approach volumes can result in large intersections with exclusive right-turn lanes, double left-turn lanes and additional through lanes. While these improvements reduce delays for vehicles, they can result in very long crossing distances for pedestrians, as well as increased pedestrian-vehicle conflicts. Therefore, Principal Arterials have a standard of LOS D except where LOS D cannot be met with three approach lanes in any direction. In those cases, the LOS E is assigned.

AM and PM Intersection Level of Service

Intersection turning movement counts were collected at 43 locations within the City in 2016. These counts were collected during a Tuesday and Thursday in April and May, in order to reflect typical weekday conditions. Level of service analysis was performed at the 43 intersections based on the latest adopted traffic counts for the AM and PM peak hours system-wide.

Background Table T–5 summarizes the intersection locations, the existing traffic control for each intersection, and the calculated LOS using the HCM methodology based upon 2016 traffic counts. The intersection LOS is also illustrated in Background Figure T–7.

See Volume I, Transportation Element Policy T.1.3 on page 86.

Intersection Level of Service Criteria

Level of service for intersections is determined by the average amount of vehicle control delay experienced by vehicles at the

Background Table T–3
Level-of-Service Criteria for Signalized and Roundabout Intersections

LEVEL-OF-SERVICE (LOS)	AVERAGE DELAY PER VEHICLE (SECONDS/VEHICLE)
A	≤ 10
B	> 10–20
C	> 20–35
D	> 35–55
E	> 55–80
F	> 80

intersection.

For signalized and roundabout (RAB) controlled intersections the LOS is calculated based on average delay for the entire intersection. Background Table T–3 summarizes the LOS criteria for signalized and RAB controlled intersections.

The LOS criteria for side-street stop controlled (SSSC) and all-way stop controlled (AWSC) intersections have different threshold values than those for signalized intersections, primarily because drivers expect different levels of performance from different types of transportation facilities. In general, stop-controlled intersections are expected to carry lower volumes of traffic than signalized and RAB controlled intersections. Thus for the same LOS, a lower level of delay is acceptable at stop-controlled intersections than it is for signalized and RAB controlled intersections.

For SSSC intersections, LOS is calculated based on the control delay of the worst approach, which tends to be the stop-controlled minor streets, or for left turn movements from major streets, whichever is worse.

Background Table T–4 summarizes the LOS thresholds for both SSSC and AWSC intersections.

Background Table T–4
Level-of-Service Criteria for Stop Controlled Intersections

LEVEL-OF-SERVICE (LOS)	AVERAGE DELAY PER VEHICLE (SECONDS/VEHICLE)
A	≤ 10
B	> 10–15
C	> 15–25
D	> 25–35
E	> 35–50
F	> 50

Source: HCM 2010.

Background Table T–5
2016 Intersection LOS – AM and PM Peak Hour

	INTERSECTION	LOS STANDARD[1]	TRAFFIC CONTROL[2]	AM[3] DELAY[4]	AM LOS[1]	PM[3] DELAY[4]	PM LOS[1]
1	Issaquah-Pine Lake Road and SE 48th Street	D	Signal	27.4	C	13.1	B
2	228th Avenue NE and NE 12th Place	D	Signal	12.4	B	8.3	A
3	Klahanie Drive SE and SE Issaquah-Fall City Road	D	Signal	59	E	120+[6]	F
4	244th Avenue SE and SE 24th Street	C	SSSC	16.6	C	14.5	B
5	SE 32nd Street and 244th Avenue SE	C	SSSC	17.7	C	37.3	E
6	Issaquah-Pine Lake Road and SE 32nd Way	D	RAB	5.2	A	5.3	A
7	228th Avenue SE and SE 40th Street	D	SSSC	32	D	67.4	F
8	SE Klahanie Boulevard and 256th Avenue SE	C	AWSC	15.4	C	14	B
9	247th Place SE and SE Issaquah-Fall City Road (Pacific Cascade Middle)	D	Signal	63.8	E	32.4	C
10	Sahalee Way NE and NE 36th Street[5]	D	SSSC	24.1	C	20.8	C
11	242nd Avenue NE and NE 8th Street	C	Signal	38.7	D	12.1	B
12	228th Avenue SE and SE 8th Street	D	Signal	12.9	B	14.4	B
13	228th Avenue NE and NE 19th Drive[5]	D	SSSC	22.6	C	21.2	C
14	216th Avenue NE and NE Inglewood Hill Road	C	RAB	6.9	A	6.4	A
15	228th Avenue NE and NE Inglewood Hill Road/NE 8th Street	D	Signal	32.6	C	23	C
16	228th Ave NE and NE 4th Street	E	Signal	32	C	15.5	B
17	228th Avenue SE and SE 4th Street	E	Signal	16.6	B	10.8	B
18	212th Avenue SE and SE 8th Street	C	SSSC	10.7	B	12.5	B
19	228th Avenue SE and SE 16th Street	D	Signal	10.1	B	9.7	A
20	East Lake Sammamish Parkway and 212th Way SE	C	Signal	5.1	A	4.5	A
21	East Lake Sammamish Parkway and SE 24th Way	C	SSSC	15.7	C	18.8	C
22	212th Avenue SE and SE 20th Street	C	AWSC	10.5	B	12.2	B
23	East Lake Sammamish Pkwy and Louis Thompson Road NE	C	Signal	10	A	10.9	B
24	East Lake Sammamish Pkwy and Inglewood Hill Road	C	Signal	23.3	C	7	A
25	Sahalee Way NE and NE 37th Way	D	Signal	12.8	B	10.4	B
26	NE 8th Street and 244th Avenue NE	C	RAB	5.4	A	4.4	A
27	228th Avenue SE and SE 20th Street	D	Signal	10.6	B	13.5	B
28	228th Avenue SE and SE 24th Street	E	Signal	16.5	B	27.4	C
29	228th Avenue SE and Issaquah-Pine Lake Road	E	Signal	23	C	35.4	D
30	Issaquah-Pine Lake Road SE and SE Klahanie Boulevard	D	Signal	28	C	17.8	B
31	Duthie Hill Road and Issaquah-Beaver Lake Road	D	Signal	29.8	C	18.9	B
32	256th Ave SE/E Beaver Lake Dr SE and Issaquah-Beaver Lake Road	C	SSSC	120+[6]	F	32.3	D
33	228th Avenue NE and NE 14th Street[5]	D	SSSC	22.9	C	23.4	C
34	228th Avenue NE and NE 25th Way	D	Signal	16.9	B	11.1	B
35	Issaquah-Pine Lake Road and SE 42nd Street	D	SSSC	18.2	C	51.4	F
36	Issaquah-Pine Lake Road and 230th Lane SE/231st Lane SE	D	Signal	79.4	E	12	B
37	NE 28th Place/223rd Avenue and Sahalee Way NE	D	SSSC	120+[6]	F	57.3	F
38	Issaquah-Pine Lake Road and SE 47th Way/238th Way SE	D	Signal	13	B	12.6	B
39	233rd Avenue NE and NE 8th Street	C	RAB	17.2	B	6.2	A
40	228th Avenue SE and East Main Street	D	Signal	3.4	A	5.4	A
41	244th Avenue NE and East Main Drive	C	RAB	5.8	A	4.8	A
42	Duthie Hill Road and Trossachs Boulevard SE	D	Signal	28.3	C	12.3	B
43	228th Avenue SE and SE 10th Street (Skyline High School)	D	Signal	21.8	C	9.7	A

1. *LOS standards are based upon the functional classifications of the intersecting roadways. Intersections that include Principal Arterials have a standard of LOS D except where LOS D cannot be met with three approach lanes in any direction. In those cases, LOS E is assigned. Intersections that include Minor Arterials or Collectors have a standard of LOS C.*
2. *Traffic Control: Signal=signalized; SSSC=side-street stop-controlled; AWSC=all-way stop-controlled; RAB = roundabout*
3. *City's defined traffic model peak hour, see Sammamish Municipal Code.*
4. *Delay is measured in seconds per vehicle. At signal, RAB, and AWSC intersections, it represents average delay for the intersection. For SSSC intersections, it represents average delay for the worst minor approach or major street left turn movements. Analysis is based on 2016 traffic counts.*
5. *LOS is the level-of-service based on the methodology outlined in the Highway Capacity Manual (HCM 2000). All other intersections are based on HCM 2010.*
6. *When intersections are overcapacity, the model shows delays growing exponentially, which likely overstates the delay that would actually be realized. The model estimates AM delay for intersection 32 at 275.2 seconds, AM delay at intersection 37 at 361.1 seconds, and PM delay for intersection 3 at 161 seconds.*

Background Figure T–7
2016 Intersection Level of Service

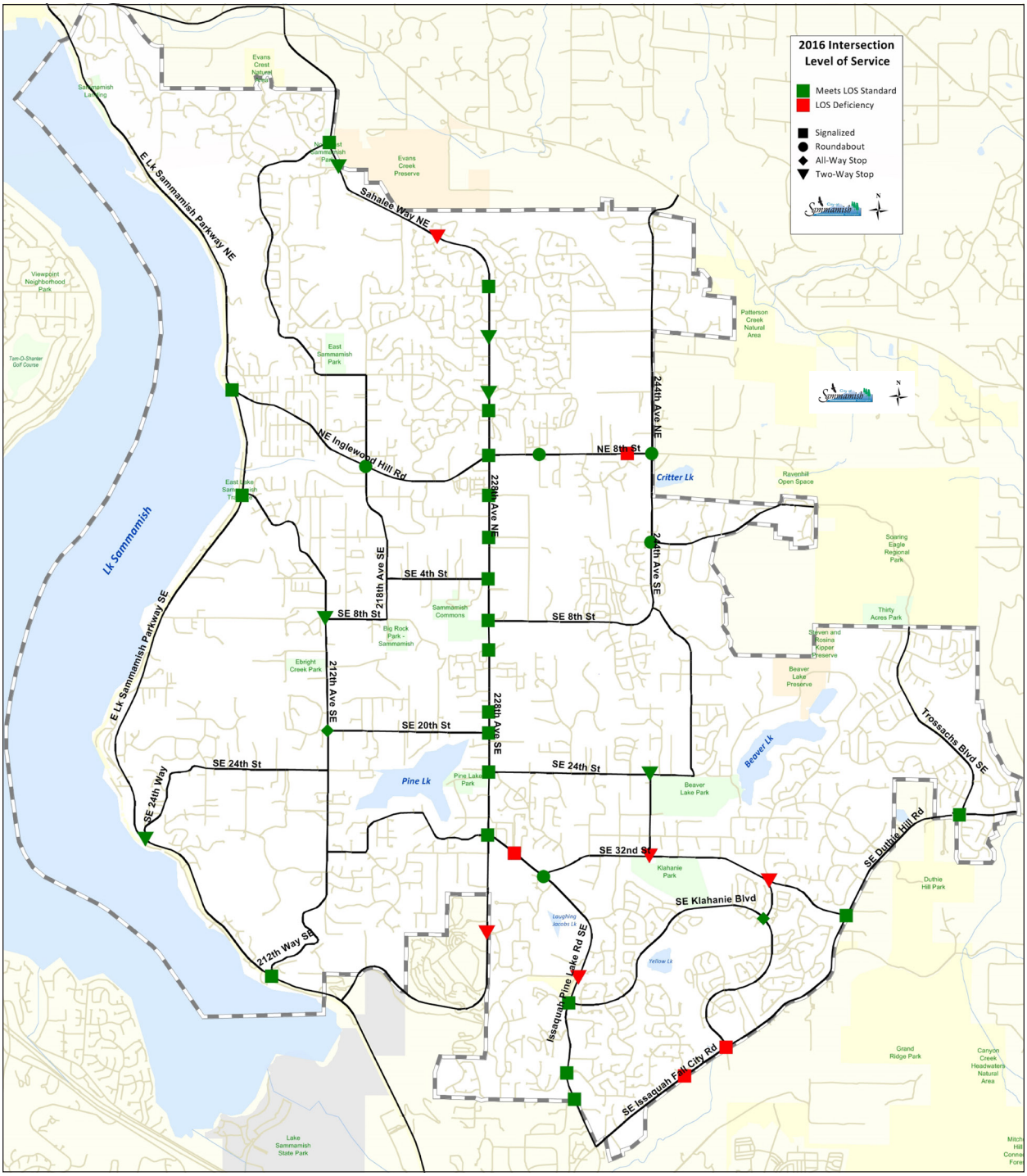


Table T-5 shows that 34 of the 43 study intersections satisfy their adopted LOS standard in the AM and PM peak hours.

Concurrency

Level of service standards are used to evaluate the transportation impacts of long-term growth and concurrency. In order to monitor concurrency, the City must adopt standards by which the minimum acceptable roadway operating conditions are determined and deficiencies may be identified.

A Concurrency Management System (CMS) is a policy procedure designed to enable a city or county to determine whether adequate facilities are available to serve new development. The Growth Management Act (GMA) requires each city and county to incorporate a Concurrency Management System into the Transportation Element of its comprehensive plan.

In a CMS, local jurisdictions must adopt and enforce ordinances that prohibit development approval if the development causes the LOS on a locally owned transportation facility to decline below the standard adopted in the Transportation Element of the Comprehensive Plan, unless transportation improvements or strategies to accommodate the impacts of development are made concurrent with the development. (Growth Management Act, RCW 36.70A, 1990)

The City of Sammamish has adopted an intersection LOS to monitor for concurrency on selected functionally classified roadways within the City.

Key Intersections Outside of the City

The following key intersections fall outside of Sammamish city limits; but have a significant impact on mobility for people travelling to and from Sammamish:

- East Lake Sammamish Pkwy and SR 202 (NE Redmond Fall City Rd
- E Lk Sammamish Pkwy and SE 43rd Way
- Sahalee Way NE and SR 202 (Redmond Fall City Rd)
- 244th Ave NE and SR 202 (NE Redmond Fall City Rd)

- Issaquah Pine Lk Rd SE and SE Issaquah Fall City Rd
- SR 520 ramp terminal intersections with SR 202
- I-90 ramp terminal intersections with 17th Ave NW, Front St, and Highlands Dr NE

While the City does not control the operations of these intersections, their function has a strong impact on Sammamish residents' ability to access opportunities in the region. Traffic analysis shows that Sammamish residents experience longer delays leaving the city in the morning and entering in the evening. The City is committed to partnering witth the jurisdictions who own those intersections to find solutions to these key regional facilities.

Collision Analysis

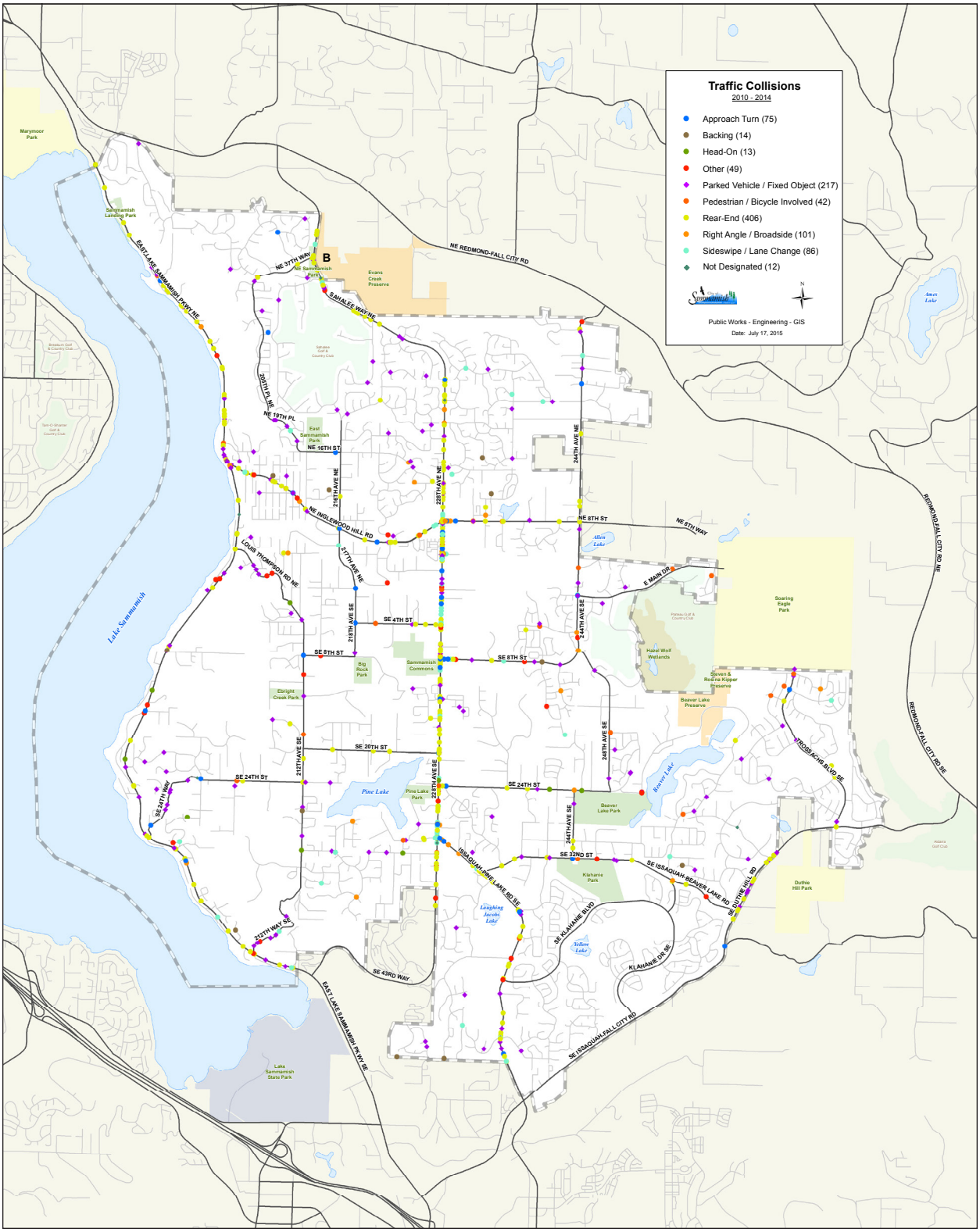
Collision statistics were compiled between 2010 and 2014 by the WSDOT Transportation Data Office for the City of Sammamish. During this five year period there were a total of 1,015 collisions reported. Background Table T–6 summarizes the collisions by type and Background Figure T–8 shows the location and type of collisions within the city.

The 228th Avenue corridor shows a high number of collisions likely due to high volumes, vehicle speeds and inexperienced drivers, the latter related to the various schools along the corridor. In addition, the 228th Avenue corridor provides access to the city's major commercial and institutional areas.

Collisions on the East Lake Sammamish Parkway corridor were concentrated at NE Inglewood Hill Road, a major access point to and from the city's existing major commercial area.

Topography and weather conditions likely play a role in a portion of the collisions reported.

Background Figure T–8
City of Sammamish Traffic Collisions (2010–2014)



There were 42 total pedestrian and bicycle-related collisions

Background Table T–6
Collision Summary (2010–2014)

COLLISION TYPE	TOTAL COLLISIONS	COLLISIONS PER YEAR
Rear-End	406	81.2
Parked Vehicle/Fixed Object	217	43.4
Right-Angle/Broadside	101	20.2
Sideswipe/Lane Change	86	17.2
Approach Turn	75	15.0
Other	49	9.8
Pedestrian/Bicycle	42	8.4
Backing	14	2.8
Head-On	13	2.6
Not Designated	12	2.4
TOTAL	1,015	203.0

reported, or 8.4 per year. These collision were spread throughout the city. Goals to reduce collisions, particularly pedestrian and bicycle-related collisions should be addressed.

Traffic Calming

As population and employment in the Sammamish region continue to grow, City streets are experiencing increased traffic pressure. City policy can accommodate growth in a way that can protect neighborhoods from unsafe impacts of traffic through the following measures:

- Develop standards to improve the function, safety, and appearance of the City street system;
- Develop facilities for pedestrians and bicyclists as alternative travel modes to the automobile;
- Protect the quality of life in residential neighborhoods by limiting vehicular traffic and monitoring traffic volumes on collector streets;
- Encourage improvements in vehicular and pedestrian traffic circulation within the City;

- Maintain a consistent LOS on the arterial system that mitigates impacts of new growth and is adequate to serve adjoining land uses; and
- Maintain the public street system to promote safety, comfort of travel, and cost-effective use of public funds.

Traffic calming programs serve to deter through-traffic on local residential streets, protect neighborhoods from vehicular traffic moving at excessive speeds, and discourage parking unrelated to residential activities.

Presently, traffic calming devices within the City of Sammamish are located primarily along:

- NE 14th Drive from 228th Avenue NE to 220th Avenue NE;
- NE 19th Drive from 228th Avenue NE to 236th Avenue NE;
- NE 25th Way from 228th Avenue NE to 239th Avenue NE;
- 217th Avenue NE from Inglewood Hill Road to Main Street;
- SE 32nd Street from 228th Avenue SE to 220th Avenue SE;
- NE 14th Street from 228th Avenue NE to 235th Avenue NE;
- Audubon Park Drive from SE 24th Street to SE 32nd Street;
- 205th Place NE from NE 31st Street to NE 37th Way;
- SE 30th Street from 244th Avenue SE to 252nd Avenue SE;
- 230th Way SE from SE 42nd Street to SE 48th Street;
- SE Windsor Blvd from 244th Avenue SE to Windsor Drive SE;
- NE 20th Way from 216th Avenue NE to NE 25th Way; and
- Sahalee Way NE at NE 28th Place.

Traffic calming features include digital speed boards, traffic circles, chokers, speed humps and curb bulb-outs.

Six-Year Transportation Improvement Program (TIP)

Background Table T–7 summarizes the list of projects that make up the Six-Year Transportation Improvement Program (TIP), 2019–2024. Funding for some of these projects is secured, while funding for other projects is not. Detailed evaluation of future conditions should assume completion only of financially committed projects.

See Volume I, Transportation Element Policy T.2.12 on page 88.

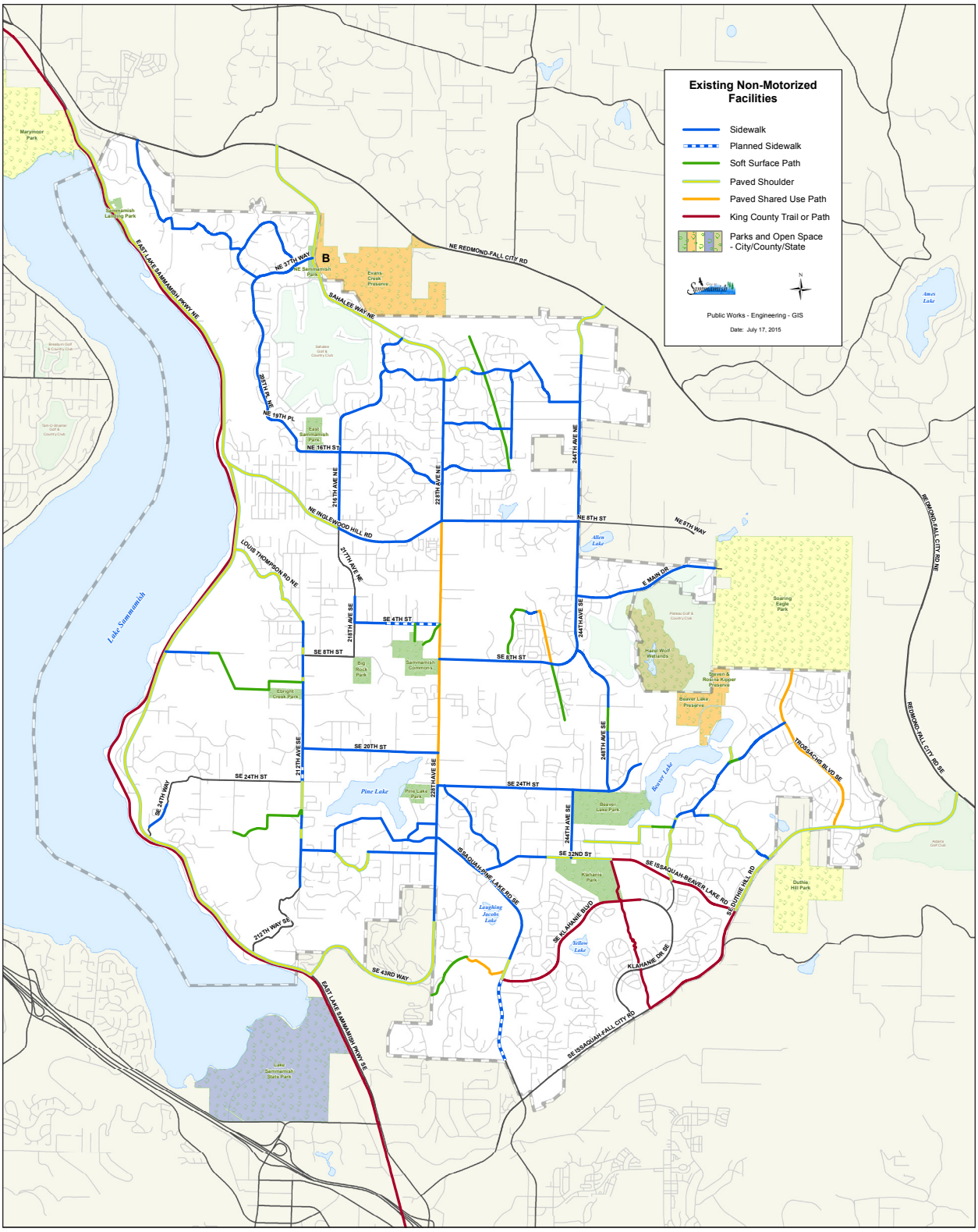
Existing Non-Motorized Conditions

An inventory of existing non-motorized facilities, including sidewalks and walkways was undertaken to identify any system gaps. Roughly 50% of the city's local roads have sidewalks and

Background Table T–7
2019–2024 Six Year Transportation Improvement Program (TIP)

TIP #	PROJECT TITLE	PROJECT EXPENDITURE (X $1,000) *Total Project*
TR-01	SE 4th St—218th Ave SE to 228th Ave SE	15,203
TR-02	Issaquah-Pine Lake Rd—Klahanie Blvd to SE 32nd	13,340
TR-03	Issaquah-Pine Lake Rd—SE 48th to Klahanie Blvd	20,214
TR-04	East Lake Sammamish Pkwy SE / SE 24th St Intersection	3,900
TR-05	Sahalee Way NE: NE 25th Way to North City Limits	848
TR-07	Issaquah-Fall City Rd: 242nd Avenue SE to Klahanie Dr SE (Phase 1)	28,807
TR-08	Issaquah-Fall City Rd—Klahanie Dr SE to Issaquah-Beaver Lk Rd	17,000
TR-18	SE 8th Street/218th Avenue SE: 212th Avenue SE to SE 4th Street	15,000
TR-19	Intelligent Transportation System (ITS)	3,000
TR-20	SE 14th Street Extension: Lawson Park Plat to 248th Ave SE	280
TR-34	228th Avenue SE & SE 8th Street Intersection	4,600
TR-39	256th Ave SE/E Beaver Lake Dr SE/Issaquah Beaver Lake Rd	1,600
TR-42	218th Avenue SE/216th Avenue SE: SE 4th Street to Inglewood Hill Road NE Analysis	7,300
TR-45	SE 32nd St/244th Ave SE Intersection Improvement	110
TR-51	SE Issaquah Fall City Rd/247th Pl SE	Cost included in TR-07
TR-52	SE Issaquah Fall City Rd/Klahanie Dr S	Cost included in TR-07
TR-53	Sahalee Way/NE 28th Pl/223rd Ave NE	1,300
TR-54	228th Ave/SE 40th	800
TR-55	242nd Ave NE/NE 8th St	880
TR-56	Issaquah-Pine Lake Rd/230th Ln SE/231st Lane SE	115
OTHER TIP PROGRAMS		
TR-A	Public Works Trust Fund Loan Repayment (228th Avenue)	10,002
TR-B	Non-motorized Transportation Projects	750 annually
TR-C	Sidewalk Projects	160 annually
TR-D	Intersection and Safety Improvements	200 annually
TR-E	Neighborhood CIP	100 annually
TR-F	Street Lighting Program	15 annually
TR-G	School Zone Safety Improvements	50 annually
TR-H	Capital Contingency Reserve Placeholder	500 annually

Background Figure T–9
City of Sammamish Existing Non-Motorized Facilities



most of the primary and minor arterials includes sidewalks, paved shoulders or shared use paths. Background Figure T–9 illustrates existing non-motorized facilities and includes the locations of the public open spaces and parks.

Existing Transit Service

Background Table T–8
Existing Transit Service for the City of Sammamish

ROUTE #	ROUTE DESCRIPTION	SERVICE	AVERAGE HEADWAY (MINUTES) *Peak*	*Midday*
216[1]	Downtown Seattle to Issaquah Highlands P&R, to South Sammamish P&R and to Bear Creek P&R	Weekday AM and PM peak hours	30	—
219[1]	Downtown Seattle to Issaquah Highlands P&R, to South Sammamish P&R and to Redmond	Weekday AM and PM peak hours	30–40	—
269[1]	Issaquah TC to Issaquah Highlands P&R, to Bear Creek P&R and to Overlake P&R	Weekday AM and PM peak hours	20–30	—
554[2,3]	NE Redmond-Fall City Road at 185th Ave NE to South Sammamish P&R, to Issaquah TC, to North Mercer Island and to downtown Seattle	Weekday Saturday	60–120 60–120	60–120 60–120

1. *King County Metro Transit Route.*
2. *Sound Transit Route; this route make infrequent trips to the City Sammamish.*

Transit Service

King County Metro and Sound Transit provide transit service to the City of Sammamish. Four transit routes currently serve the City, with service as summarized in Background Table T–8.

Park-and-Ride Facilities

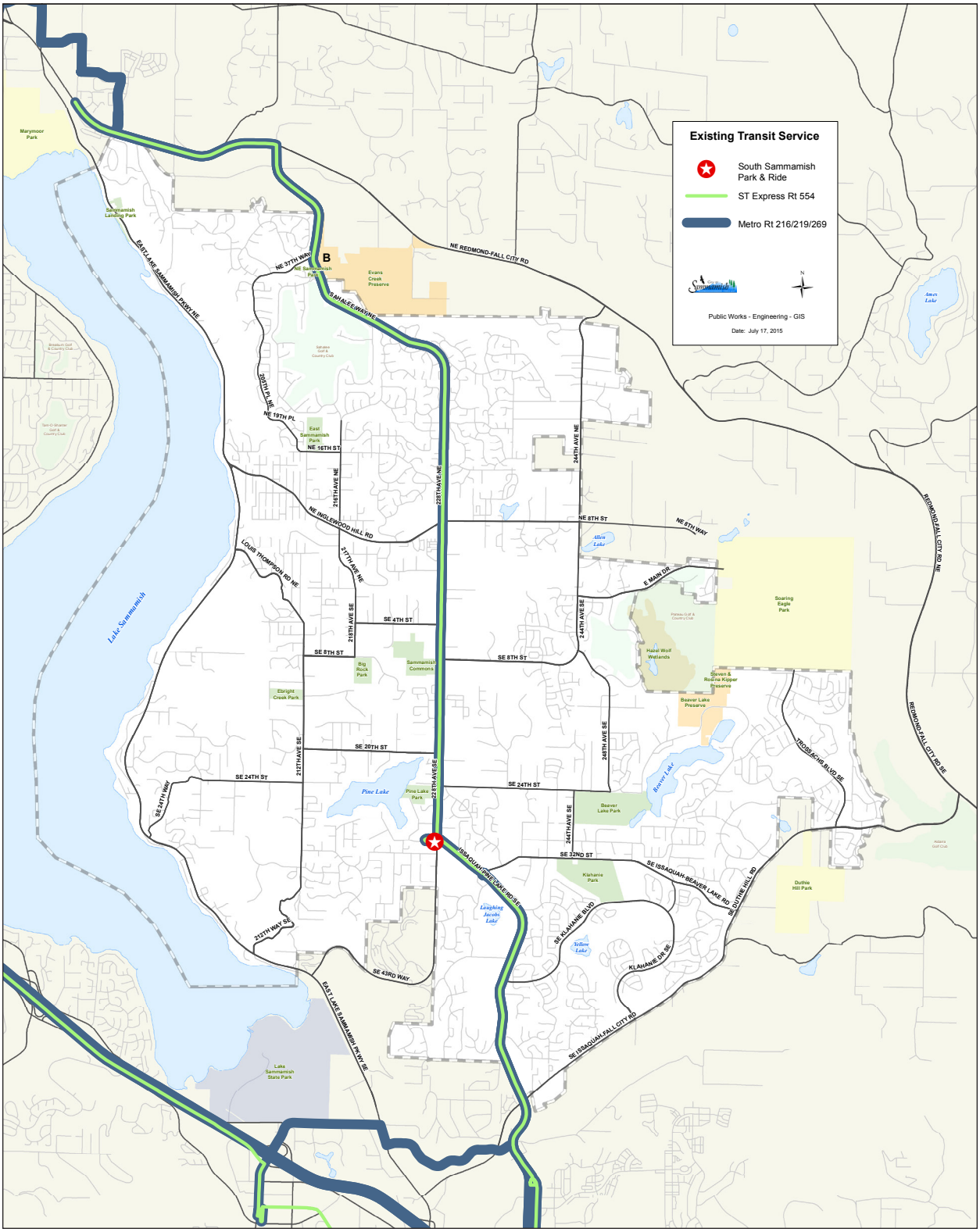
Sammamish currently has two park-and-ride (P&R) facilities:

- Sammamish Hills Lutheran Church at SE 8th Street and 228th Avenue SE (54 spaces).
- South Sammamish P&R at Issaquah-Pine Lake Road SE and 228th Avenue SE (265 spaces).

Existing transit routes and P&R lots within the Sammamish city limits are shown in Background Figure T–10. Outside of the city limits, the nearest P&R lots are:

- Klahanie P&R at SE Klahanie Boulevard and 244th Place SE, King County (30 spaces).
- Klahanie P&R at SE Klahanie Boulevard and SE Issaquah-Fall City Road (30 spaces).
- Tibbett's Valley P&R at 12th NW and Newport Way, Issaquah (94 spaces).
- Issaquah Highlands P&R at Highlands Drive NE and NE High Street, Issaquah (1,010

Background Figure T–10
Existing Transit Service



Travel Demand Forecasts and Projected Needs

In order to evaluate future transportation needs, forecasts must be made of future travel demand. Developing traffic forecasts for existing streets based on future land use allows the adequacy of the street system to be evaluated.

Travel Forecasting Model

For the City of Sammamish Transportation Element, a transportation computer model was developed using the VISUM software to analyze future travel demand and traffic patterns. VISUM is among the world's leading software for traffic analyses and forecasting and is applied by engineers, planners, and scientists, as well as numerous city, State and Federal transportation agencies. VISUM aids in predicting long-term trends in traffic, trip generation, distribution and growth over an area, such as a city. It is not intended to assess operations or a particular solution for a specific intersection.

The City has three VISUM-based travel models that differ in their time horizon. The first models 2016 existing conditions (Existing Conditions Model). The second represents the City's six-year TIP (Pipeline Concurrency Model) and forecasts traffic to evaluate concurrency failures over the next six years with approved pipeline projects. The third model forecasts further out into the future to the Comprehensive Plan horizon year of 2035 (Forecast Model).Following the concurrency policy adopted in this Comprehensive Plan, the City will maintain both an AM and PM version for each model.

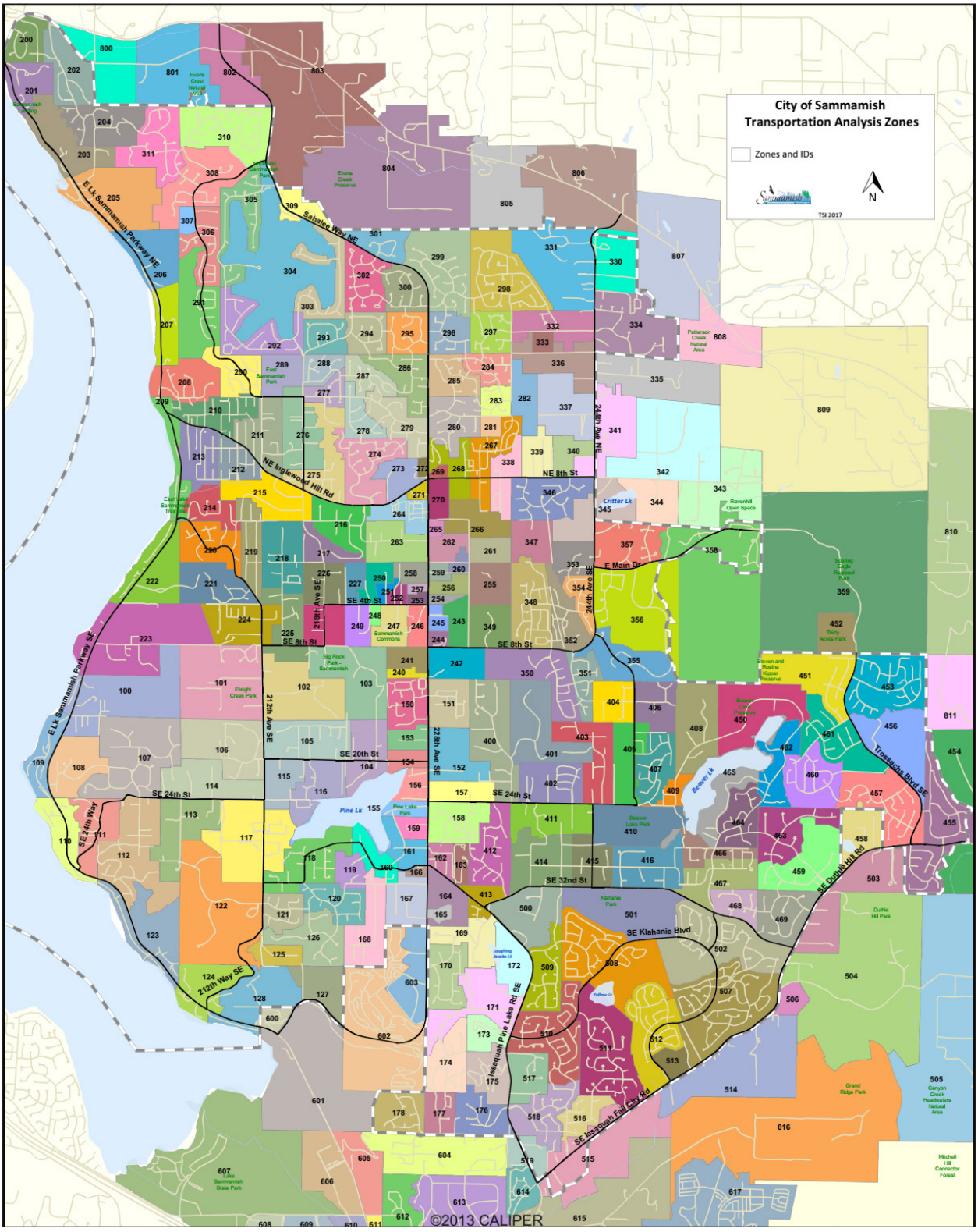
There are three key data points that feed into VISUM including land use, physical roadway network characteristics, and traffic counts. How these data are incorporated into the model is described in the following sections.

The major steps of the modeling process are as follows:

- Current Land Use Assessment;
- Trip Generation;
- Trip Distribution;
- Network Assignment;
- Model Calibration;
- Forecast of Future Land Use; and
- Model of Future Traffic Conditions.

These general steps of the modeling process are described in the following sections, and the technical aspects of the model are described in detail in the Traffic Forecasting Model Documentation Report (DEA 2012), which has been produced for the city as a supplemental document to the Comprehensive Plan.

Background Figure T–11
Transportation Analysis Zones



Current Land Use Assessment

The primary method of determining future travel demand is based on future land use patterns and community growth. The entire study area is divided into Transportation Analysis Zones (TAZs) that have similar land use characteristics. The TAZ boundaries that were established for the City of Sammamish travel-forecasting model are shown in Background Figure T–11. For each zone, land use characteristics of population and employment were estimated based on the City of Sammamish Comprehensive Land Use Plan. In order to establish an accurate base map of existing land use, consultants to the city began with the King County Assessor records, supplemental aerial photos, and field verification of a subset of lots. City staff compiled unit counts of multi-family dwellings and commercial building square feet based on King County records supplemented with some field review.

Trip Generation

The trip generation step forecasts the total number of trips generated by and attracted to each TAZ. The trips were forecast using statistical data that take into account population and household characteristics, employment information, economic model output, and land-use information. Trips generated are categorized by their general purpose, which are:

- Home-based-work: any trip with home as one end and work as the other end
- Home-based-other: any non-work trip with home as one end
- Non-home-based: any trip that does not have home at either end

The trip generation model forecasts the total number of trips that are generated per household or non-residential unit during the analysis period for the trip categories under consideration.

Trip Distribution

The trip distribution step allocates the trip generation to a specific zonal origin and destination. This is accomplished through use of the gravity model, which distributes trips according to two basic assumptions: (1) more trips will be attracted to larger zones (the size of a zone is defined by the number of attractions estimated in the trip generation phase, not the geographical size), and (2) more trip interchanges will take place between zones that are closer together than the number that will take place between zones that are farther apart. The result is a trip matrix (for each of the

trip purposes specified as input to the trip generation model) that estimates the percentage of trips are taken from each zone to every other zone. These trips are often referred to as trip interchanges.

Transportation Network Characters and Assignment

The physical characteristics of the City's roadway network as of 2016 is reflected in the model. This includes the number of lanes and posted speed limits. The number of legs, type of intersection controls (e.g. stop-controlled, signalized or roundabouts), and turn pocket lengths are also included for the concurrency intersections.

The street system is coded into the city's Traffic Model as a series of links that represent roadways and nodes that represent the intersection of those roadways. Each roadway link and intersection node is entered into the model with an assigned functional classification, and associated characteristics such as length, capacity, and speed. This information is then used to determine the optimum path between all the zones based on travel time and distance. The model then distributes the trips from each of the zones onto the street network.

The forecasted trips are assigned to the transportation network using an incremental assignment process where the total traffic is assigned to the network, one increment at a time. Vehicle travel paths reflect the best travel time between each origin and destination. After a portion of the vehicles is assigned, the zone-to-zone travel times with the additional traffic are recalculated. The next increment of traffic is assigned to the network, and the optimal paths are determined based upon the adjusted travel times. The zone-to-zone travel times are calculated again, reflecting the added traffic. The cycle of network assignment and travel time recalculation is repeated, until all vehicles have been assigned to the network. The result is a computerized road network with traffic volumes calculated for each segment of roadway, which takes into account the effects of increasing traffic congestion on the system.

Model Calibration

The 2016 calibrated VISUM travel demand model developed by DEA has a mean relative error of 3% and is a very good representation of the traffic generated by a known land uses (2016 occupied development). The calibration error does not directly relate to the accuracy of the forecast in that the land use assumptions are general, factors including fuel prices, social objectives, and other issues modify travel behaviors over time. In most case future forecasts should be considered with a broader

margin of error. A range of plus or minus 10% is a reasonable error to assume for a 20-year planning horizon. This potential error should be considered when evaluating the travel demand forecasts and level of service summaries. Forecast volumes could be 10% more or less in most cases. Standard industry best practices for the frequency of model calibration is every 4-6 years.

Model Update and Validation

The City conducts annual validation of its traffic models to ensure they continue to predict traffic volumes and growth within industry standards for accuracy. This is done by comparing the most recent traffic counts with the model outputs. All trips generated by approved concurrency certificates are also added to the model at the time of approval.

Land Use Assumptions used in Travel Demand Forecasting

The land use assumptions used in the VISUM travel demand forecasting model are based upon the Land Use Element of the Comprehensive Plan, which in turn is based upon the PSRC residential and employment allocations for Sammamish. External land use assumptions were based upon PSRC forecasts for the jurisdictions around Sammamish, including the cities of Redmond, Issaquah and Bellevue to ensure that the forecast trip distribution for trips originating in or destined to the region outside the city are modeled correctly. Key elements of the land use forecast include infill single family residential development in vacant and underdeveloped land identified in the buildable lands analysis and the realization of the Town Center, a mixed use subarea planned for for 2,000 dwelling units, and 600,000 square feet of commercial space.

Future Traffic Conditions

Once future land use conditions were input, the model was run to forecast PM peak hour traffic conditions that are expected to result from the projected land use.

Background Table T–9
Summary of Recommended Transportation Improvements

TIP#	LOCATION	IMPROVEMENT	PROJECT COST (X $1,000)[1]
TR-23	E Lk Sammamish Pkwy SE, 212th Ave SE–South City Limits	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk	10,935
TR-03	Issaquah-Pine Lk Rd SE, SE 48th St–SE Klahanie Blvd	Widen to 5 lanes with bike lanes, curb, gutter and sidewalk	21,315
TR-02	Issaquah-Pine Lk Rd SE, SE Klahanie Blvd–SE 32nd Way	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk	21.651
TR-01	SE 4th St, 218th Ave SE to 228th Ave SE	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk	18,981
TR-05	Sahalee Way NE, NE 25th Way–North City Limits	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk	16,801
TR-24	SE Duthie Hill Rd, SE Issaquah-Beaver Lk Rd–"notch"	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk on west side, 8-foot shoulder on east side	13,230
TR-26	SE Duthie Hill Rd, West side of "notch" to Trossachs Blvd SE	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk on west side, 8-foot shoulder on east side	13,230
OLD/ LOAN recognition	228th Ave	Public Works Trust Fund Loan Repayment (remaining loan balance)	3,808
TR-27	Issaquah-Pine Lake Rd SE, SE Issaquah-Fall City Rd–SE 48th St	Widen to 5 lanes with bike lanes, curb, gutter, and sidewalk	7,882
TR-07	SE Issaquah-Fall City Rd, 242nd Avenue SE–Klahanie Dr SE	Widen to 5 lanes with bike lanes, curb, gutter, and sidewalk	17,321
TR-08	SE Issaquah-Fall City Rd, Klahanie Dr SE–SE Issaquah-Beaver Lk Rd	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk	15,917
TR-29	SE Belvedere Way, E Beaver Lk Rd–263rd Pl SE	New roadway connection, extend SE Belvedere Way to E Beaver Lk Dr SE	761
TR-30	New Roadway Connection to E Beaver-Lk Dr SE at 266th Way SE	Extend 266th Way SE to E Beaver Lk Dr SE and widen E Beaver Lk Dr SE, 266th Way SE to Beaver Lk Way SE	8,498
TR-25	212th Way SE (Snake Hill), E Lk Sammamish Pkwy SE–212th Ave SE	Improve 2 lanes with left-turn pockets, curb, gutter, and sidewalk	13,738
TR-18	SE 8th St/218th Ave SE, 212th Ave SE–SE 4th St	Widen to 3 lanes with bike lanes, curb, gutter, and sidewalk	10,117
	Sidewalk Projects	Various sidewalk projects, includes gap projects, extensions, safety improvements	5,000
	Transit Program	Provide funding for capital project matching funds and/or provide for additional transit service.	10,000
	Neighborhood CIP	Various capital improvement including safety improvements, gap projects, bike routes, pedestrian safety enhancements, and school zone safety improvements.	2,000
	Street Lighting Program	Provide street lighting at high priority locations with significant safety issues that can be addressed through better street lighting	400

Background Table T–9
Summary of Recommended Transportation Improvements (cont.)

TIP#	LOCATION	IMPROVEMENT	PROJECT COST (X $1,000)[1]
	Intersection Improvements	Various intersection and other spot improvement as needed, including channelization, signing, safety improvements, signalization, or other control devices.	5,000
TR-04	East Lake Sammamish Parkway SE / SE 24th St Intersection	Add turn pocket and acceleration lane on East Lake Sammamish Parkway, separate turn lanes on SE 24th	3,900[2]
TR-39	256th Ave SE/E Beaver Lake Dr SE/ Issaquah Beaver Lake Rd	Construct roundabout	1,600[2]
TR-51	SE Issaquah Fall City Rd/247th Pl SE	Construct roundabout	Cost included in TR-07
TR-52	SE Issaquah Fall City Rd/Klahanie Dr S	Construct roundabout	Cost included in TR-07
TR-45	SE 32nd St/244th Ave SE Intersection Improvement	Install all-way stop control	110[2]
TR-53	Sahalee Way/NE 28th Pl/223rd Ave NE	Install signal	1,300[2]
TR-54	228th Ave/SE 40th	Create center turn lane on 228th, modify median on SE 40th	800[2]
TR-55	242nd Ave NE/NE 8th St	Add westbound right turn pocket, widen NE 8th	880[2]
TR-56	Issaquah-Pine Lake Rd/230th Ln SE/231st Lane SE	Rechannelize/restripe 230th Ln & 231st Ln, extend WB left turn pocket on Issaquah Pine Lake Rd	115[2]

1. *All project costs are in 2014 dollars unless separately noted.*
2. *2018 cost estimates.*

Recommended Plan

Based upon evaluation of existing conditions, travel demand forecast and evaluation of future conditions that result from the 2035 land use forecast, and the concurrency standards and priorities stated by the city, the Recommended Plan contains the following elements:

- Recommended Transportation Improvements
- Functional Classification Assessment
- Connectivity Assessment
- Roadway Design Guidelines
- Traffic Calming Program
- Transportation Demand Management
- Transit Service and Facilities
- Non-Motorized Facilities

Recommended Transportation Improvements

Based upon the analysis of 2016 and 2024 traffic operations against the level of service policy described earlier this chapter and 2035 level of service analysis performed as part of the 2015 Comprehensive Plan, a list of recommended improvement projects was developed for the 2035 planning horizon. The list of improvement projects is summarized in Background Table T–9.

Planning level estimates were prepared for each of the projects under consideration.

Intersections Outside City Limits

Outside of the city limits, several key intersections are projected to have a significant impact on city mobility. Continued coordination with jurisdictional partners like Issaquah, Redmond, King County and WSDOT will be necessary.

See Volume I, Transportation Element Policy T.2.15–Policy T.2.22 on page 89.

Flexibility in Roadway Design Guidelines

Essential functions of streets in Sammamish include vehicle mobility, pedestrian access, bicycle access, and aesthetics. City standards specify lane widths of 11 feet. Left-turn lanes increase capacity, reduce vehicular collisions, and improve access to adjacent property. Bicycle lanes should be provided along major traffic corridors, and when striped should be a minimum of 5 feet in width. Sidewalk widths should be a minimum of 6 feet. Landscaped medians are especially important to soften wide expanses of pavement, to provide a haven for crossing pedestrians, and to

provide aesthetic treatment to streets.

Often when designing streets, obstacles are encountered that require modification in design approach. Impediments might include topographic features that make road construction difficult or very expensive; inadequate available right-of-way to allow for all desired features; or environmentally sensitive areas that require modification to avoid adverse impacts. Additionally, funding or grant sources may require specific features or dimensions.

Traffic Calming Program

The City of Sammamish has a comprehensive traffic calming program in place with the Neighborhood Traffic Management Program (NTMP) described in the Existing Conditions section of this Transportation Element. Thus, it is recommended that the city continue the NTMP in its current form, as already adopted by City ordinance.

Transportation Demand Management

See Volume I, Transportation Element Policy T.2.8–Policy T.2.10 on page 87.

Transportation Demand Management (TDM) consists of strategies that seek to maximize the efficiency of the transportation system by reducing demand on the system. The results of successful TDM can include:

- Travelers switch from single-occupancy-vehicle (SOV) to HOV modes such as transit, vanpools or carpools,
- Travelers switch from driving to non-motorized modes such as bicycling or walking,
- Travelers change the time they make trips from more congested to less congested times of day,
- Travelers eliminate trips altogether through such means as compressed workweeks, consolidation of errands, or use of telecommunications.

Within the State of Washington, alternative transportation solutions are further necessitated by the objectives of the Commute Trip Reduction (CTR) Law. Passed in 1991 as a section of the Washington Clean Air Act (RCW 70.94), the CTR Law seeks to reduce workplace commute trips in the nine most populous counties in the state. This law requires that in designated high population counties, each city within the county adopt a commute trip reduction plan requiring private and public employers with 100 or more employees implement TDM programs. Programs provide various incentives or disincentives to encourage use of alternative transportation modes, other than the SOV. The purpose of CTR

is to help maintain air quality in metropolitan areas by reducing congestion and air pollution.

The city can promote TDM through policy and/or investments that may include, but are not limited to, the following:

- Public Education related to the benefits of TDM and individual actions to reduce vehicle trips
- Commute Trip Reduction (CTR) Ordinances
- Voluntary Compliance with CTR requirements by the city
- Managed access to facilities and activity centers
- Transit-oriented and pedestrian-friendly design
- Parking management

See Volume I, Transportation Element Policy T.2.15–Policy T.2.22 on page 88.

Transit Service and Facilities

As supported by the Goals, Objectives and Policies of the Transportation Element, public transportation has long-range benefits for the community because it offers:

- Primary mobility for those who cannot drive, including many of our youth, seniors, and citizens with disabilities,
- Mobility options for people who choose not to drive, either to avoid congestion, save money, or support the environment,
- Preservation of the quality of our environment by conserving energy, supporting better air quality, and reducing congestion on our roadways.

Central to the success of a public transportation system is the development of a compatible land use plan. Low-density suburbs and strip development are not designed to accommodate public transportation services. Changing the land use or traditional transit services is difficult and special attention is required to increase the effectiveness of transit by controlling development; modifying the existing arterial street system; and modifying pedestrian facilities to bring passengers to the transit system.

The City of Sammamish can influence compatibility with public transportation by considering the following development issues:

- Pedestrian access and facilities,
- Amount, cost, and location of parking,
- Location of higher density residential developments,
- Location and design of commercial and employment activities,
- Location of transit facilities,
- Location of community activity centers,

- Design of building complexes and their surroundings.

228th Avenue provides the primary corridor to support activity centers and more transit-oriented development. New development, redevelopment, or in-fill development that occurs in major activity centers can be designed to incorporate features that are compatible with public transportation. These features include:

- Land use that creates densities to support transit,
- Facilities that are oriented toward transit service,
- Walking distances that are on a reasonable pedestrian scale,
- Site design that encourages transit riders.

Zoning provisions are the primary means of implementing transportation-related land use policy. In order to accomplish this, the zoning code for major activity centers can be reviewed to ensure transit friendly design in these areas. Some factors that may be considered are:

- Encourage public transportation-compatible in-fill development on areas near transit routes and stops,
- Support the development of park-and-ride lots along transit routes,
- Encourage pedestrian uses at street-level buildings to stimulate activity and interest,
- Support increased residential densities along transit routes,
- Support increased employment densities in activity centers.

See Volume I, Transportation Element Policy T.2.8 and Policy T.2.10 on page 88.

In addition, transit can be made more compatible with pedestrian travel by observing the following design guidelines:

- Provide sidewalks and safe crosswalks for access to the transit system,
- Include provisions for weather protection of the pedestrian,
- Eliminate barriers that discourage pedestrian access,
- Keep walking distances to a quarter-mile or less,
- Provide curb ramps and other facilities conforming to the Americans with Disabilities Act (ADA),
- Provide lighting to improve pedestrian safety and security,
- Provide design guidelines to foster and encourage pedestrian activity.

Special emphasis should be placed on the identification and public awareness of the transit system. Specific tasks could include improved signing, identification, and improved transit stops; route and schedule information provided at all transit stop sites; and shelters provided at some sites. Shelters provide a visual reminder of transit availability and provide an incentive for residents and

visitors to use the transit system. Shelters can be installed only in locations with adequate public right-of-way and where appropriate pads can be constructed.

The success of the public transportation system is dependent on integrating key elements that comprise the overall plan. Integration of the transit system with streets, bicycle facilities, and pedestrian facilities is critical to transit's success.

See Volume I, Transportation Element Policy T.2.12 and Policy T.2.13 on page 88.

Non-Motorized Plan

The Trails, Bikeways and Paths Plan is a comprehensive planning document for the City of Sammamish addressing a 20-year vision for development of recreational trails and non-motorized transportation facilities within the city. The dual focus on recreational trails and public right-of-way non-motorized facilities is an intentional effort to create a well-integrated system for pedestrians, bicyclists, equestrians, and other trail users in the city. The title of the plan is also a reflection of the desire for an integrated system. "Trails, Bikeways and Paths" is a melding of terminologies to de-emphasize the differences between recreation-based and transportation-based facilities, and to underscore the common themes and the benefits of an integrated system.

A vital aspect of the plan and a key part of the message is that this vision is for an integrated system. It was decided early on to pursue a system that avoided the historical, but somewhat arbitrary, distinctions between a non-motorized and a trails plan. This more holistic approach will provide additional flexibility in implementing the overall vision to connect key destinations that in many instances may not be possible to connect using one type of route or the other. It will also provide opportunities for interdepartmental coordination and will bring a greater efficiency to the effort. The benefits far outweigh the inconveniences of developing the plan in such a manner. The resulting system will be greatly enhanced as a result of this integrated approach.

This vision has been developed through a concentrated community outreach effort and through consistent dialogue and involvement of a citizen advisory committee called the Trails, Bikeways and Paths (TBP) Subcommittee. This advisory committee was formed to assist in guiding the development of this plan and reports to the Parks and Recreation Commission regarding the progress of the plan. In addition, community input was gathered at multiple points during the planning process and through the review and adoption process by the City Council.

The development of a vision for the future required an extensive effort to document existing trail and non-motorized facilities to provide a current picture and identify gaps in the system. An existing conditions inventory was completed for all trail and non-motorized facilities in the

city, including private trail systems. Documentation of private trail systems was done to provide an understanding of how a proposed public system could integrate with private neighborhood facilities. In addition, key challenges and obstacles were identified to assist in developing proposed system improvements.

Key survey data was collected from the public regarding use of trails, destinations, locations, intensity of use, etc.

This information, along with feedback from the TBP Subcommittee and guidance from state and regional policy on non-motorized facilities, provided the basis for the development of TBP goals and policies. Then, basic overall trail corridors were identified to provide for east/west and north/south connectivity through the city.

With consideration of state, regional, and local design standards a hierarchy of pathways and trail types, as well as bicycle facility types, was created to specifically address the needs and conditions on the Sammamish Plateau. Each facility type description includes detailed information on facility width, height clearances, appropriate location, and surfacing.

The pathway and trail facility types range from paved multi-use trails to primitive soft surface trails, and also include all of the standard sidewalk facilities along streets and roadways. The bicycle facility types are consistent with state and regional standards for signed and striped bike lanes, designated shared bike routes, and multi-use shared paths.

Next, the identified corridors and field conditions were taken into consideration in assigning the hierarchy of facility types to all of the proposed routes. Considerations in this process included existing right-of-way and obstacles, topography, community destinations, and types of potential users. This process resulted in a 20-year pathways and trail system plan and bicycle system plan.

The overall vision is a direct reflection of the community's desire to use trails, bikeways, and paths for travel and recreation purposes. Please see the City of Sammamish *Trails, Bikeways and Paths Master Plan*.

Establishment of LOS Standards & Monitoring

In order to monitor concurrency, the City must adopt standards to identify deficiencies, which were presented earlier in this plan. While the GMA requires that LOS standards be adopted for concurrency, it does not mandate how those standards should be defined. Thus, the City is free to adopt by ordinance whatever standards it deems appropriate.

On a continuing basis, the City shall monitor and evaluate the adequacy of the concurrency policies and established LOS standards as new development occurs and as traffic levels grow. The City shall make periodic adjustments to the Concurrency Management System and LOS standards as needed and as part of the annual Comprehensive Plan amendment process, based on the on-going evaluation.

Mitigation Fee System

The City has adopted a transportation impact fee.

See Volume I, Transportation Element Policy T.3.12–Policy T.3.21 on page 91.

Financing

The Growth Management Act requires that the transportation-related provisions of comprehensive plans address the financing of the local transportation system. The multiyear financing plans serve as the basis for the six-year street, road, or transit program for cities, counties, and public transportation systems and should be coordinated with the state's six-year transportation improvement program.

Background Table T–10
Transportation Capital Improvement Funding: 2015–2035

FUNDING SOURCE	AMOUNT (2015 DOLLARS)
Transportation Fund Revenue (REET)	25,000,000
Road Impact Fees (includes beginning fund balance)	35,000,000
Anticipated grants	15,000,000
Funding to be determined	162,000,000
TOTAL REVENUE	237,000,000

Total revenue available to the City of Sammamish for concurrency projects over a 20-year period is estimated in Background Table T–10. The estimated revenue projection is $237,000,000 (year 2015 dollars). The projected revenue presented in Background Table T–10 provides a revenue stream for the expenditures proposed for the next 20 years, based upon these preliminary estimates.

See Volume I, Transportation Element Policy T.3.19 on page 92.

Contingency Plans in the Event of Revenue Shortfall

Some of the revenue forecasts are for revenues that are very secure, and highly reliable. However, other revenue forecasts are for sources that are volatile, and therefore difficult to predict with confidence, including grants, joint agency funding, the motor vehicle registration fee, general obligation bonds, and mitigation payments (which have not been enacted), and which fluctuate with the amount of new development.

In the event that revenues from one or more of these sources is not forthcoming, the city has several options: add new sources of revenue or increase the amount of revenue from existing sources; require developers to provide such facilities at their own expense; reduce the number of proposed projects; change the Land Use Element to reduce the travel demand generated by development; or change and/or lower the LOS standard.