In addition, future street connections should be studied and determined with each neighborhood plan update. The neighborhood plan study should include looking at efficient and convenient road connections to schools, parks and other public facilities, and commercial centers. Adding bicycle, pedestrian and other nonmotorized connections should also be considered.

Policy T-4.4: Minimize bypass traffic and safety impacts on neighborhood streets.

Cut-through traffic onto neighborhood streets from nearby congested arterials or collectors does occur. The intent of this policy is to minimize the amount of cut-through traffic and the impacts of this traffic when it does occur by the use of various forms of traffic-calming techniques.

Policy T-4.5: Maintain and improve convenient access for emergency vehicles.

Emergency vehicles need to access sites using the shortest route possible. Providing an interconnected street network is the best way to achieve direct access.

One major barrier to direct access in Kirkland is I-405. Consideration should be given to providing for emergency vehicle access when new nonmotorized crossings of I-405 are planned.

Policy T-4.6: Ensure adequate access to commercial and industrial sites.

The transportation needs of commercial and industrial uses are important to Kirkland's future. For our economy to prosper, freight, employees, and customers must be able to move to and from businesses. This further supports the need to minimize congestion in the community.

Policy T-4.7: Maintain the road system in a safe and usable form for all modes of travel where possible.

A significant portion of the public's investment in City infrastructure resides in the pavement of City streets. The City must protect this investment through regular road maintenance. The Public Works Department has operated a Pavement Management Program since 1990. The pavement condition of each road has been inventoried to allow for the strategic investment of maintenance funds. Besides pavement maintenance, Public Works has a regular program for pavement marking, storm drain cleaning, street sweeping, sign maintenance, and similar street maintenance.

With current funding levels and repair strategies, the overall condition of City streets is stable. If the level of funding does not stay constant or increase, the overall condition could fall off at a rate from which it would be impossible to recover without a very large investment. A higher level of funding would cause the overall condition to improve.

Policy T-4.8: Provide for local vehicular access to arterials, while minimizing conflicts with through traffic.

One problem along some arterials is the high number of driveways or places where vehicles can enter or leave traffic lanes. An excessive number of driveways is a safety concern for pedestrians on sidewalks. Also, traffic flow is unexpectedly interrupted when vehicles turn between intersections. However, properly located and spaced driveways can benefit traffic flow.

The intent of this policy is to permit the minimum number of curb cuts needed to adequately serve abutting uses. The end result will be minimizing conflicts with pedestrian and vehicular traffic.

Goal T-5: Establish level of service standards that encourage development of a multimodal transportation system.

Policy T-5.1: Develop an approach for measuring level of service based on the standards described below in Policies T-5.2, T-5.3 and T-5.5.

Developing level of service standards for a transportation system is a difficult task. After much study and discussion, the City decided that an intersection capacity technique was the best choice for Kirkland.

Mode split (the percentage of single-occupant vehicle use and transit or other mode use) is used as the level of service standard for transit (Policy T-5.2). For vehicular level of service, the City has developed an aggregated roadway level of service measure that averages the capacity of signalized intersections within a geographic area (Policy T-5.3). Nonmotorized level of service is expressed in terms of miles of completed bicycle and pedestrian facilities and number of complete corridors and reflects the desire to create an interconnected system of bicycle and pedestrian routes (Policy T-5.5).

Policy T-5.2: By the year 2022, strive to achieve a mode split of 65 percent single-occupant vehicle (SOV) and 35 percent transit/other mode.

The mode splits described in this policy are the level of service standard for transit. They represent a long-term goal for the City to achieve through providing improved transit accessibility, transportation demand management programs, efficient nonmotorized systems, locating shops and services close to home, and other strategies to get people out of single-occupant vehicles. The standard is expressed in terms of a desired percentage of peak-hour home to work trips by single-occupant vehicles and transit/other mode.

Policy T-5.3: Utilize the peak-hour vehicular level of service standards shown in Table T-2 – a two-part standard for the transportation subareas and for individual system intersections.

This policy establishes a peak-hour level of service (LOS) standard for vehicular traffic based on 2022 land use and road network. It is a two-part standard, based on the ratio of traffic volume to intersection capacity (V/C) for signalized system intersections. Volume to capacity ratios were determined using the planning method from *Transportation Research Circular 212.*

The two standards are as follows:

(1) Maximum allowed subarea average V/C for signalized system intersections in each subarea may not exceed the values listed in Table T-2.

(2) No signalized system intersection may have a V/C greater than 1.40.

Table T-2
Maximum Allowed Subarea Average V/C Ratio for System Intersections and Individual Intersection LOS

Use as Maximum Allowed Average V/C after January 1st ⇨	2004	2005	2006	2007	2008
Forecast for Year ⇨	2009	2010	2011	2012	2013
Subarea	Average V/C Ratio				
Southwest	0.89	0.89	0.89	0.90	0.90
Northwest	0.88	0.89	0.89	0.90	0.91
Northeast	0.86	0.87	0.87	0.88	0.89
East	1.04	1.04	1.04	1.05	1.05
Maximum allowed individual system intersection V/C ratio	1.40	1.40	1.40	1.40	1.40

The LOS standards were calculated through the use of a computerized transportation model shared with Bellevue and Redmond, called the BKR model. The standards are the outcome of land use and transportation network choices which were entered into the model.

In particular, a network of capacity projects was chosen that could be funded by levels of spending that are consistent with the amount spent on transportation capacity projects in recent years. The network also consists of projects that are in keeping with the community values found elsewhere in this Comprehensive Plan. It is the intention of this plan that intersection performance will be kept as high as possible, preferably with V/C ratios under 1.30. However, forecasts show that this may not be attainable so the maximum intersection V/C ratio is set at 1.40.

Table T-2 is designed to provide standards for the maximum allowed subarea average V/C ratio for the next few years. To pass the road concurrency test, new development may not exceed the maximum allowable subarea average V/C ratio for system intersections (see Table T-3 below) six years into the future starting from the date of making a concurrency application. The first row of Table T-2 (italicized) indicates the year that a proposed development is submitted for a road concurrency test. The second row indicates the six-year horizon that a new development's traffic impacts are assessed. Each set of standards in the column below the application year and the horizon year is based on a LOS forecast for six years in the future. Forecasts are derived by linear interpolation between forecasts for 2004 and 2022 and include forecasted impacts of development that have been approved but not yet built.

Example of how to use Table T-2: A development is seeking concurrency approval during 2005. What is the set of standards for subarea average V/C that the development must not exceed? Since the project is seeking approval in 2005, the second column of numbers is used. This set of standards (southwest subarea standard of 0.89, northwest subarea standard of 0.89, etc.) corresponds to a forecast horizon year of 2010. The development's traffic impacts may not cause the level of service at the signalized system intersections to exceed these standards.

In addition, the LOS methodology requires both standards (subarea average V/C and V/C not to exceed 1.40) to be satisfied. Traffic from a new development may not cause the average V/C of system signalized intersections in a subarea to operate at an LOS lower than the average and may not cause any system signalized intersection to exceed a V/C ratio of 1.40 as shown in Table T-2.

The capacity (C) of a signalized intersection is determined by a wide variety of factors, including signal phasing, number of lanes and traffic mix. It is a measure of the maximum number of vehicles that can go through the intersection in a set period of time. The volume (V) is the sum of "critical" volumes that indicate maximum demand at the intersection. The volume to capacity ratio (V/C) is the volume divided by the capacity. For the purpose of the plan, V/C is calculated for the PM peak hour.

A V/C of less than 1.0 means that the volume at the intersection is less than the capacity. If the V/C is equal to 1.0, the intersection's volume and capacity are equal. When the V/C is greater than 1.0, volume has exceeded capacity. As the V/C increases, the congestion at the intersection increases and the level of service gets worse.

Underlying the standards is the concept that the system is not considered failing if the peak-hour is congested. Use of the peak-hour for measuring level of service is standard in the region. This "worst case" measure implies that traffic will flow better during the rest of the day. Although very high, the V/C ratios in the standard are acceptable because there is a limited amount of funding available to improve the situation, and it is not possible to build our way out of congestion even if funds were unlimited. Road widening has quality-of-life impacts that many in the community find unacceptable.

The standards are based on congestion becoming worse in the future. This reflects the proposed network and funding, and an increase in trips. The need to move to alternative modes becomes all the more clear when we can see the peak-hour vehicular level of service forecasted for the future.

Table T-3 describes subarea average V/C ratios for 2003 traffic counts and for forecast 2004 and 2022 volumes. These numbers are provided for reference.

Table T-3
2003 and Forecasted Subarea Average LOS for System Intersection

Subarea Average V/C Ratio			
Subarea	2003 Traffic Count	2003 Traffic Plus Projects Approved but Not Yet Built	2022
Southwest	0.77	0.89	0.92
Northwest	0.83	0.88	1.01
Northeast	0.76	0.86	0.99
East	0.94	1.04	1.10

Table T-4 below lists intersections that are not system intersections and are therefore not considered in the calculations.

Table T-4
Signalized Intersections Not System Intersections

The following signalized intersections are not system intersections. All other signalized intersections installed prior to August 2001 are system intersections.
6th Street/4th Avenue
3rd Street/Kirkland Avenue
6th Street/Kirkland Way
98th Avenue NE/NE 120th Place
93rd Avenue NE/Juanita Drive
97th Avenue NE/Juanita Drive
NE 124th Street/120th Place NE
NE 118th Street/120th Avenue NE
NE 128th Street/116th Way NE
120th Avenue NE/NE 80th Street
NE 132nd Street/108th Avenue NE
NE 132nd Street/Juanita High School
NE 132nd Street/Juanita Elementary School
120th Avenue Pedestrian Signal at Totem Lake Mall

Figure T-5 below shows the City's four subareas used for the maximum allowed subarea average V/C ratio standard in Table T-2 for signalized system intersections.

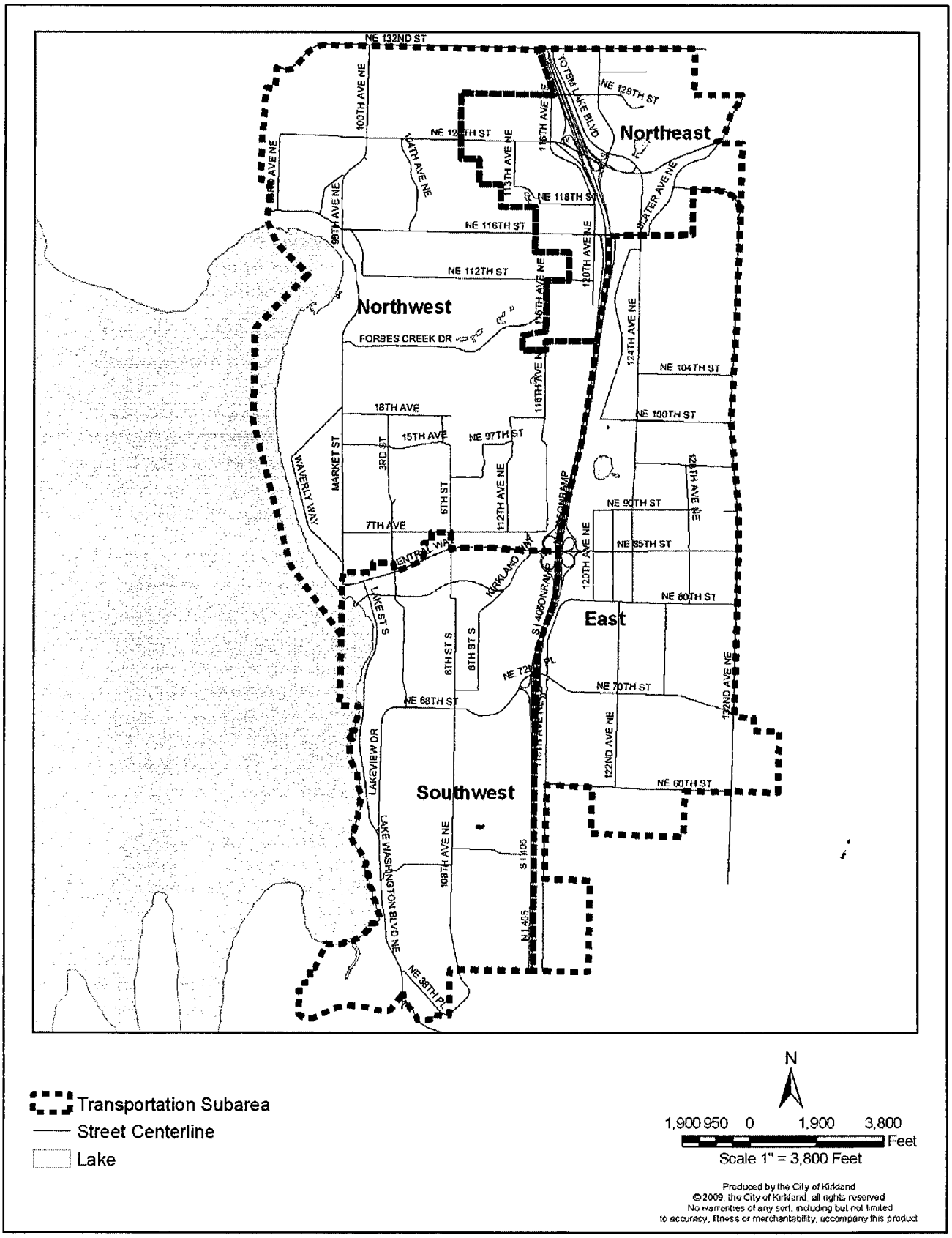

Figure T-5: Transportation Subareas

Policy T-5.4: Require new development to mitigate site-specific transportation impacts.

The standards in T-5.3 relate to maintaining the long-term performance of the road network system throughout Kirkland. Besides meeting those standards, new development should mitigate its site-specific impacts to the transportation system. For individual development, the nature and timing of the mitigation should be based on the magnitude and proportionate share of the impacts and the timing of development. Mitigation may be necessary for impacts to intersections and local roadways, including pedestrian, bicycle and transit facilities. In addition, mitigation may be needed for site access to and from the local roadway system. The City will provide traffic impact guidelines to establish the basis for evaluating what needs to be mitigated and the timing and extent of the mitigation.

Policy T-5.5: Strive to achieve a level of service standard by 2022 of 59 miles of bicycle facilities and 155 miles of pedestrian facilities, six east-west and four north-south completed pedestrian corridors, and four east-west and two north-south completed bicycle corridors as identified in the Nonmotorized Transportation Plan.

The LOS standard for the nonmotorized system reflects the desire to create an interconnected system of pedestrian and bicycle routes. The standards for bicycle and pedestrian facilities are based on the priority routes indicated in the Nonmotorized Transportation Plan (NMTP) and the City's Transportation Program Evaluation Criteria. The City considers the following factors when determining the location of new bicycle and pedestrian facilities: completion of the interconnected system established in the NMTP, safe school routes and connections to public facilities, commercial centers and regional pedestrian and bicycle routes. The existing system has deficiencies and gaps that the proposed standards strive to complete.

Figures T-2 and T-3 show the proposed bicycle and pedestrian corridor facilities to meet Policy T-5.5.

Policy T-5.6: Promote transportation demand management (TDM) strategies to help achieve mode split goals. TDM may include incentives, programs, or regulations to reduce the number of single-occupant vehicle trips.

Transportation demand management seeks to modify travel behavior and encourage economical alternatives to the single-occupant vehicle. Transportation demand management strategies try to influence behavior in a way that keeps expansion of the transportation system at a minimum. The more successful TDM strategies are, the more successful the City will be at achieving the mode split goals described in Policy T-5.2.

The following are some TDM strategies: (1) working cooperatively with employers to implement programs that encourage employees not to drive alone; (2) requiring certain new developments to implement programs to reduce single-occupant vehicle use; (3) adjusting parking standards to meet existing demand and reducing them further when transportation options increase; and (4) supporting paid parking or other parking policy measures.

Policy T-5.7: Assure that transportation improvements are concurrent with development to maintain the vehicular level of service standard for the development's subarea.

The Growth Management Act requires that transportation improvements and programs needed to accommodate planned growth be provided concurrently as new development occurs. Concurrency requires the balancing of three primary factors: available financial resources, acceptable transportation system performance conditions (level of service), and the community's long-range vision for land use and transportation.