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Memorandum

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to Kamuron Gurol, City of Sammamish

prepared by Alex Cohen, ESA Adolfson, Mike Birdsall, David Evans Associates, and Dan McKinney, Jr., The Transpo Group

Sammamish Town Center Sub-Area Plan

Technical Memorandum on the DEIS Transportation Analysis

The Draft Environmental Impact Statement (DEIS) for the proposed Sammamish Town Center Sub-Area Plan was issued on January 31, 2007. Since the date of issuance several Planning Commissioners, City Council members, and citizens have raised questions regarding the methods and data presented in the transportation analysis (Chapter 7). City staff held two public meetings on February 21, 2007 and March 9, 2007 at which the public (including planning commissioners and council members) were invited to ask questions of the City transportation staff, the city's transportation consultants, (David Evans and Associates (DEA)), and the DEIS consultant team (ESA Adolfson, EIS lead and The Transpo Group (Transpo), DEIS Transportation analysis lead).

At these meetings several clarifying questions were raised regarding the methods behind the transportation analysis and the conclusions. Several written questions were also submitted to the City. To the extent possible, city staff and the consultant team addressed these questions at the meetings. Where further inquiry or adjustment were required city staff and the consultant team agreed to research questions, refine data, and /or add further explanations for elements of concern.

The purpose of this memo is to present these questions and to provide supplemental data, adjustments to the analysis or expanded explanations for the issues raised. The organization of this memo follows the topics that were raised. Each issue is presented as a bold header and followed by a response in the text. There are also several attachments, which are referred to under particular topics..

1. Variations in Daily Tube Counts

Concerns have been raised about differences in traffic counts from year to year, and even within the same year from different sources. Consistent with standard industry best practices, traffic engineers understand that traffic counts at the same location will vary by as much as 10% from day to day for the reason that people's daily activities are not the same every day. Traffic varies due to factors such as special events, weather conditions, and traffic conditions elsewhere. Within a year, seasonal variations may be 10% to 25% in urban areas, and higher in

rural areas. To reduce the uncertainty associated with counts, it is typical to take the average of 2 to 3 day's counts, or count for an entire week and compute the weekly average. But that is not always done, for economy. Counts at different points along a road (e.g., East Lake Sammamish Parkway between Sammamish and Redmond) also may vary due to turning activity along the road between those points, so care must be taken to adjust for intermediate events when comparing counts at different locations.

The trend of historical counts at the same location does not always change at the same rate as the surrounding area as a whole. A highly congested road may show little change from year to year in spite of area-wide growth because there is little capacity to accept more growth. When that happens, it is likely that a parallel road will exhibit above-average growth. The sum of both roads' growth would tend toward the average for the area.

2. Section 36 Park Trip Generation

As explained at the March 9, 2007 meeting, the disparity of volumes on Trossachs Boulevard is not related to development activity but to an inconsistency in the handling of future user activity at the Section 36 park. This is easily corrected in the traffic model, to obtain consistent volumes on Trossachs Boulevard for all cases. It will also add some traffic volumes to various roads citywide, dissipating with distance from Trossachs Boulevard.

3. Updated Traffic Volume Figures:

It was noted that the volume ratios between the PM peak hour and the daily volumes fluctuated from alternative to alternative. The small variations were due to rounding; and the larger variations were due to reporting the PM volumes from a slightly different segment of the link than from the location that daily volumes were reported. These figures were updated to report the PM peak hour volume for the same location that the daily volumes were generated from. The updated figures are provided in **Attachment A.**

4. Relative Impacts of the Alternatives

Total Trip Distribution

Attached (**Attachment B**) are three small figures showing the flow of trips generated by each DEIS alternative for the Town Center site. These show the distribution of travel to and from the Town Center site. The scale of each of the three figures is the same, so relative comparisons between the figures are reasonably good indicators of different volume magnitudes.

Please note: The direct impact of Town Center in the figures in **Attachment B** is a larger number at some locations than the net change from No Action for the same alternative. This is a manifestation of Town Center trips being internalized within Sammamish. As some Town Center trips are assigned to destinations within Sammamish, they displace other Sammamish-based trips. Traffic distributions for all zones in Sammamish are affected by Town Center. Some trips at other zones are redistributed, citywide, due to the new opportunities provided by the land use in Town Center.

Therefore, simply adding the direct impact of any alternative to the No Action base forecast tends to over-predict total future demand, especially at the fringes of the city. That is not usually an issue for individual developments. But with a planned area of this magnitude, the redistribution effects within Sammamish are significant. The traffic model addresses that automatically. The reader is advised to use the direct impact plots for a general impression of where Town Center trips go. Use the net difference between cases for the net impact.

Trip Generation Analysis

The following tables provide more detailed trip generation summaries for each Town Center alternative than was presented in the DEIS. Specifically, this provides the breakdown of trips generated by each general land use category and provides the inbound and outbound split. Trip generation rates within each general land use category include a variety of subtypes, which differ somewhat between the alternatives. For example; the residential category includes single-family and multi-family dwellings; the retail category includes everything from gas stations and fast food restaurants to specialty stores, drug stores, and supermarkets; the office land use accounts for all types of non-retail employment; and open space is a general category used in the traffic model to represent parks, playgrounds, etc. The open space trip allowance is a constant in the traffic model for all three alternatives.

The total trips reported for each land use alternative is larger than previously reported in the DEIS because in this format each trip that remains within Town Center is counted twice – once outbound and once inbound. The summary in the DEIS didn't accurately account for this. There has been no change in the actual amount of trip generation to the external roadway network; only the manner of reporting has changed. The main impact of this change is that the percentage of trips internalized is larger than previously described, and more consistent with the level commonly expected for multi-use developments. Beyond the boundaries of Town Center, all trips are the same as previously reported.

Trip generation summaries are presented in various ways, to answer particular interests at the boundary of Town Center, versus the boundaries of the City of Sammamish. Directional splits in and out of the developments are provided, which show the difference in directionality of residential trip generation versus office generation or retail generation, in the afternoon peak hour.

Alternative 1 Trip Generation Summary

PM Peak Hour Trip Generation:

Land Use	Amount	Units	Out-bound	In-bound	Total	Share	Out-bound	In-bound
Residential	3,514	dwellings	717	1247	1964	28%	37%	63%
Retail	530	1,000 s.f.	2074	1894	3968	56%	52%	48%
Office	416	1,000 s.f.	378	125	503	7%	75%	25%
Open Space	550	Trips	325	301	627	9%	52%	48%
Total Trips			3495	3567	7062	100%	49%	51%

Trip Distribution by Major Areas (from trip table):

Within Town Center	1374	1374	2748	39%	50%	50%
To/From Sammamish Other	1391	1209	2600	37%	54%	47%
To/From External Areas	730	984	1714	24%	43%	57%
Total Trips	3495	3567	7062	100%	49%	51%

Total Trips without double-count of "within" trips: 5688

Net trip generation leaving Town Center:	4314	49%	51%
Net trip generation leaving Sammamish:	1714	43%	57%

Alternative 2 Trip Generation Summary

Afternoon Peak Hour Trip Generation:

Land Use	Amount	Units	Out-bound	In-bound	Total	Share	Out-bound	In-bound
Residential	1,104	dwellings	308	474	782	26%	39%	61%
Retail	167	1,000 s.f.	782	691	1473	50%	53%	47%
Office	30	1,000 s.f.	34	8	42	1%	80%	20%
Active Land	550	Trips	349	315	663	22%	53%	47%
		Total Trips	1472	1488	2960	100%	50%	50%

Trip Distribution by Major Areas (from trip table):

Within Town Center	376	376	752	25%	50%	50%
To/From Sammamish Other	845	713	1558	53%	54%	46%
To/From External Areas	251	399	650	22%	39%	61%
Total Trips	1472	1488	2960	100%	50%	50%

Total Trips without double-count of "within" trips: 2584

Net trip generation leaving Town Center:	2208	50%	50%
Net trip generation leaving Sammamish:	650	39%	61%

Alternative 3 Trip Generation Summary

Afternoon Peak Hour Trip Generation:

Land Use	Amount	Units	Out-bound	In-bound	Total	Share	Out-bound	In-bound
Residential	2,961	dwellings	635	1084	1719	36%	37%	63%
Retail	254	1,000 s.f.	1147	1026	2173	45%	53%	47%
Office	200	1,000 s.f.	183	59	242	5%	75%	25%
Active Land	550	Trips	344	313	657	14%	52%	48%
		Total Trips	2309	2482	4791	100%	48%	52%

Trip Distribution by Major Areas (from trip table):

Within Town Center	871	871	1742	36%	50%	50%
To/From Sammamish Other	1060	919	1979	41%	54%	46%
To/From External Areas	378	692	1070	22%	35%	65%
Total Trips	2309	2482	4791	100%	48%	52%

Total Trips without double-count of "within" trips: 3920

Net trip generation leaving Town Center:	3049	47%	53%
Net trip generation leaving Sammamish:	1070	35%	65%

Directional Distribution of Trips within Sammamish

The figures presented in **Attachment C** show the directional distribution pattern of trips generated in Town Center, for residential and non-residential land uses. The focus of these figures is on the trips leaving Town Center. Alternative 1 was used for these illustrations; however, the general pattern of distribution would be the same for the same land use type, in other alternatives. Total numbers of trips obviously change, but the directional patterns would be the same in a proportional sense.

The thickness of the flow patterns is proportional to volume, and the direction of travel is indicated by which side of the centerline the flow pattern is drawn. In the residential figure, the majority of travel is shown in the direction toward Town Center, since PM peak hour conditions are depicted. In the PM peak hour, roughly two-thirds of residential trip generation is inbound, toward the residence.

The non-residential distribution pattern represents a combination of retail and office developments – the mixed use concept for Town Center. The directional orientation is approximately equal in each direction, overall, but with slightly more outbound than inbound travel. Both figures are drawn to approximately the same scale, so the comparison between both figures can be used to approximately estimate the relative shares of impact on any road between the residential and non-residential developments in Town Center.

From the underlying numerical data, the relative directional distribution patterns were also summarized at three locations ranging from the edges of Town Center itself, to a mid-plateau location, and to the edges of the City of Sammamish. The share of trips oriented to the north versus the south changes depending on where the measure is taken, and whether the measure is for trips only on 228th Avenue NE/SE or on all north-south routes that carry shares of total travel.

For residential trip generation, the northward orientation of trips is 53% nearest to Town Center on 228th only, and 55% about a half-mile further away in each direction, but now counting the sum of three parallel routes. At the north and south city limits, this orientation drops to 49%. This shift is consistent with the retention of a substantial part of Town Center travel within the City of Sammamish. The higher emphasis toward the south at the city limits is consistent with the fact that commuter trips from employment elsewhere are somewhat more likely to travel via I-90 through Issaquah than via SR202 through Redmond.

The non-residential trip orientation is more pronounced toward the north, at 59% within Sammamish, and still 55% at the city limits. This is consistent with the fact that the external residential areas that will be providing employees and shoppers to future commercial developments in the Town Center are larger to the north than to the south (e.g., greater Redmond and areas from Bear Creek to Carnation, as compared to Issaquah).

The north-oriented pattern for future Town Center non-residential trips stands out as being different from the existing patterns of general traffic in Sammamish, which tends slightly more to the south than the north. This is because most Sammamish traffic today is residentially based. The residential distribution for Town Center is closer to the existing residential average for Sammamish, while the non-residential part is more north-oriented.

5. Response to Mr. Savage Letter

The transportation team was presented with a letter from Joe Savage, P.E. by Commissioner Hamilton and asked for a response. Many of Mr. Savage's points were addressed during the March 9, 2007 meeting and his specific points are covered in paragraph order. The letter is included as attachment F

(a) Peak Hour to Daily Ratio of 10%. Joe has essentially agreed with Transpo and DEA that the 10% factor is not a "standard" but only a "rule of thumb" to fall back on if there is no other information to go on. The specific traffic count data available for Sammamish in years 2002 to 2006 shows a range of factors that are generally in the 8% to 9% range, and almost never match 10%. This is due to widespread congestion and associated peak-spreading.

(b) Estimated vs. Actual Existing Traffic. The discussion at the March 9, 2007 meeting clarified that all the "existing" data in the DEIS represents actual counts taken in 2006. Existing 2006 roadway link traffic volumes are summarized in **Attachment D**, showing the AM and PM peak hour volumes compared to the Daily volumes.

Mr. Savage's letter recommends that "all analysis of levels of service at intersections and on street segments should be performed with peak hour rather than daily volumes." The intersection analysis was indeed done on peak hour volumes; however, consistent with City's concurrency methodology, the segment analysis was done on the daily equivalent volumes. Both methods are required to be done that way by the Comprehensive Plan as adopted City policy. There is no reason in Sammamish to do segment analysis based on peak hours.

(c) Disagreement over Peak Hour Methods. In looking at the modeled numbers, the team can assure that the peak hour turn movements at the intersections analyzed and the peak hour link volumes posted in figures are consistent and correct. Link volumes match exactly the sum of turn movements at intersections.

(d) Accuracy and Validity of the Model Results. The traffic model does not use counts at all, so questions pertaining to recent counts have no bearing on the traffic model. Traffic model forecasts are derived from land use forecasts, totally independent of count data. The model was accurately calibrated to "forecast" 2001 counts based on input of 2001 land use. In the DEIS, the only use of 2006 count data is to describe existing conditions for general information. If the count data changes, that has zero effect on the traffic model forecasts. Any concerns about real world count data in 2003 to 2006 do not in any way extend to concern about the traffic model.

(e) Future Growth Rate may not be Sufficient. The forecast of 1% annual average growth on East Lake Sammamish Parkway is not unreasonable for that location, in context. Much more growth is forecast on 244th Avenue NE due to the future extension of that road. Figures 7-3 through 7-6 show forecast volumes that equate to 3% per year for the No Action case and as high as 5% per year with Alternative 1. The combination of both roads is consistent with the overall growth forecast for Sammamish as a whole.

For a comprehensive perspective of citywide growth rates, the following table presents data available in the City's Concurrency Monitoring System and the Town Center model forecasts, for total peak hour trip generation in Sammamish. All figures are based on the traffic model:

TOTAL PEAK HOUR TRIP GENERATION

Year	Trip Generation	Annualized Growth from 2006
2001	16,510	
2006 (estimated)	18,500	
2013 Pipeline	20,845	1.8%
2030 No Action	22,720	0.9%
2030 Alternative 1	29,583	2.5%
2030 Alternative 2	25,398	1.6%
2030 Alternative 3	27,476	2.0%

In this table, the 2030 No Action growth rate is lower than other rates, because that amount of growth is based on the current land use density assumptions in the Comprehensive Plan. Town Center alternatives would modify those policies and allow for more growth, resulting in higher average growth rates.

The current pipeline of developments in process represents the first phase of the No Action growth envelope. It appears to be "front-loaded" compared to the long-range rate to 2030 No Action. Note, however, that the year associated with pipeline developments is an artificial assumption. It is assumed to be six years ahead for planning purposes (such as calculating average growth rates for the next six years) but that is merely an assumption. The year that the pipeline growth will be 100% complete is actually at the whim of the marketplace.

(f) Model's Reasonableness Questioned. See response in (d) above.

(g) Model Calibration. The City has a complete model calibration report, prepared by DEA's Mike Birdsall while employed at Earth Tech. It shows that the model exceeds the expectations of the FHWA "standards" by a large margin. This calibration information was presented to the Ad-Hoc Planning Advisory Committee in 2002 and was part of the process of establishing credibility of the model and model forecasts that supported the adoption of the Comprehensive Plan Transportation Element in 2002.

(h) Quick Check on Model Validity. The model calibration report includes just such a table of screenlines, showing the model to be within 2% to 5% of actual counts in 2002. We agree that the screenline technique is a useful way to summarize traffic trends. If necessary, it could be incorporated into the FEIS, as an additional way to view and understand in proper context the data already provided.

6. Comparison of AM and PM Peak Hour Traffic

The City of Sammamish collected updated traffic volumes throughout the City in late February and early March 2006. Specifically the data was collected February 28th through March 2nd. A figure summarizing the average AM peak hour, PM peak hour, and Daily counts is provided in **Attachment A**. As shown in the figure, all of the PM peak hour volumes exceed the AM peak hour volumes with the exception of one location. The AM peak hour traffic volumes on 244th Avenue NE, just south of SR 202 (NE Redmond Fall City Road), are slightly higher. The remainder of the City has higher traffic volumes occurring during the PM peak hour. Since traffic volumes are typically highest during the PM peak hour, the City's traffic model and concurrency program have been developed around the PM peak hour.

The focus of the analysis was based on the PM peak hour, as the combination of traffic generated by any of the Town Center land use alternatives along with the adjacent street traffic would be at the highest levels during the PM peak hour.

Intersection levels of service were evaluated for both the AM and PM peak hours in the Eastside Catholic EIS analysis. Although the AM peak hour volumes are lower than the PM peak hour volumes, there are some locations where the level of service is worse during the AM peak hour. This occurs most notably along Eastlake Sammamish Parkway at SE 56th Street, Inglewood Hill Road, and SR 202. This is due to the large volume of traffic heading off the Sammamish Plateau funneling toward Redmond. The PM volumes are still higher than the AM peak hour due to a more balanced flow of volumes in both directions. The existing level of service results and volumes reported in the Eastside Catholic High School EIS are provided in **Attachment E**.

7. Traffic Counts and Future Forecast Modeling

Commissioner Hamilton asked for clarification of the message that "numbers don't matter, only land use matters" for the modeling, which appears to contrast with his understanding that traffic counts are a key component of concurrency and traffic mitigation impact fees. Part of the answer is to differentiate carefully between different kinds of traffic numbers. All numbers are not created equal. Traffic "numbers" in a report may be of several kinds:

- Actual counted volumes – various methods, differing accuracy levels;
- Manually estimated volumes in lieu of actual counts, as a substitute for counts;
- Manually estimated future volumes based on existing counts plus growth assumptions; and
- Future volumes forecast by computer models based on land use forecasts.

Where future conditions are concerned, forecasts can be generated either by manual projections based on an existing count plus estimated growth trends, or by a traffic forecasting model based on land use. These are two very different methods. The manual method based on counts is common practice with traffic impact studies for individual developments with near term horizon years, since the development being studied usually adds only a small (comparatively) impact to background traffic. The success of this method obviously depends on the quality of the initial count data and the accuracy of the assumed distribution pattern for site impacts. When many developments are combined and a long term horizon year is used, the method loses accuracy because there are multiple interactions between all developments. Background assumptions become very important, and litigation abounds over such issues. Because the method is done by hand, and relies on assumptions to cover the background issues, there is much diversity of results between different analysts.

The traffic model approach treats all developments in a consistent way. Traffic forecasting models also provide the background context by covering the entire city or subarea, not just the development at hand. All input assumptions are land use projections in each individual Traffic Analysis Zones. But traffic models are large, complex systems that need careful calibration in the beginning and expert operation and maintenance thereafter. Such models are also not perfect, but a well-calibrated forecasting model comes close to matching existing counts, when existing land use data is input. That validation test is the only way that counts are used with a forecasting model. After that, it's all forecast numbers. The best use of forecasting models is to compare one model case to another model case, because that tends to neutralize the calibration differences between the model

and reality. In the DEIS, the evaluation of the Town Center alternatives is based on the comparison to the No Action alternative.

The Sammamish Traffic Forecasting Model was calibrated to closely match 2001 counts, based on the input of 2001 land use data and road network information. This calibration accuracy gives confidence that that model will predict future volumes with similar accuracy. In addition to planning studies, the model is used for concurrency, to track the cumulative effect of adding new development applications to the 2001 land use base. The resulting volume forecasts represent the future condition when all pipeline developments are developed and generating traffic. The 2030 model is based instead on the City's total growth projections to "buildout" based on land use codes (or alternative assumptions) beyond the present day concurrency pipeline.

Do 2006 counts have to do with the traffic model? No. The model calibration to counts was done with 2001 counts and 2001 land use data. The calibration is still valid for this use. The 2006 counts show that growth has happened since 2001, in real terms. The traffic model also shows growth. It forecasts higher volumes for the concurrency future than were true in 2001. But since the concurrency future case includes all development now in the planning/permit/construction pipeline, it goes well beyond existing 2006 conditions. As long as the 2006 counts fall somewhere between the 2001 counts and the concurrency future forecast, the model is working as designed.

Why then are 2006 counts even reported in the DEIS? They are reported to provide the reader with a sense of today's volumes and level of service as a reference. They do not directly serve to help the evaluation of the future alternatives.

8. North/South Distribution of Trips

Commissioner Moran asked the transportation team to clarify the assumption that the majority of traffic, from town center, would head south vs. north, given that it is in the LWSD. The trip distribution pattern for the Town Center site is modeled for the afternoon peak hour, roughly 5 pm or later. Activity at high schools at this time is small compared to the peak hour for each high school that occurs earlier in the day. Travel between the Town Center and Eastlake High School at this hour is nearly negligible. Travel at other hours of the day is accounted for by the peak-to-daily expansion factors on 228th that are used to estimate daily volumes from the peak hour assignment. Existing patterns of orientation to each high school are a constituent part of the existing expansion factors, so the mid-day high school connection to Town Center is actually covered in the forecast daily travel volumes. That said, the high school portion of daily travel patterns is not a dominant part of the total travel activity of any residential area, Town Center or otherwise. For commercial areas, it is even less. For both residential and commercial land uses in the future Town Center, there is a roughly even split of destination opportunities for travel to the south and to the north, with a slightly larger emphasis to the south.

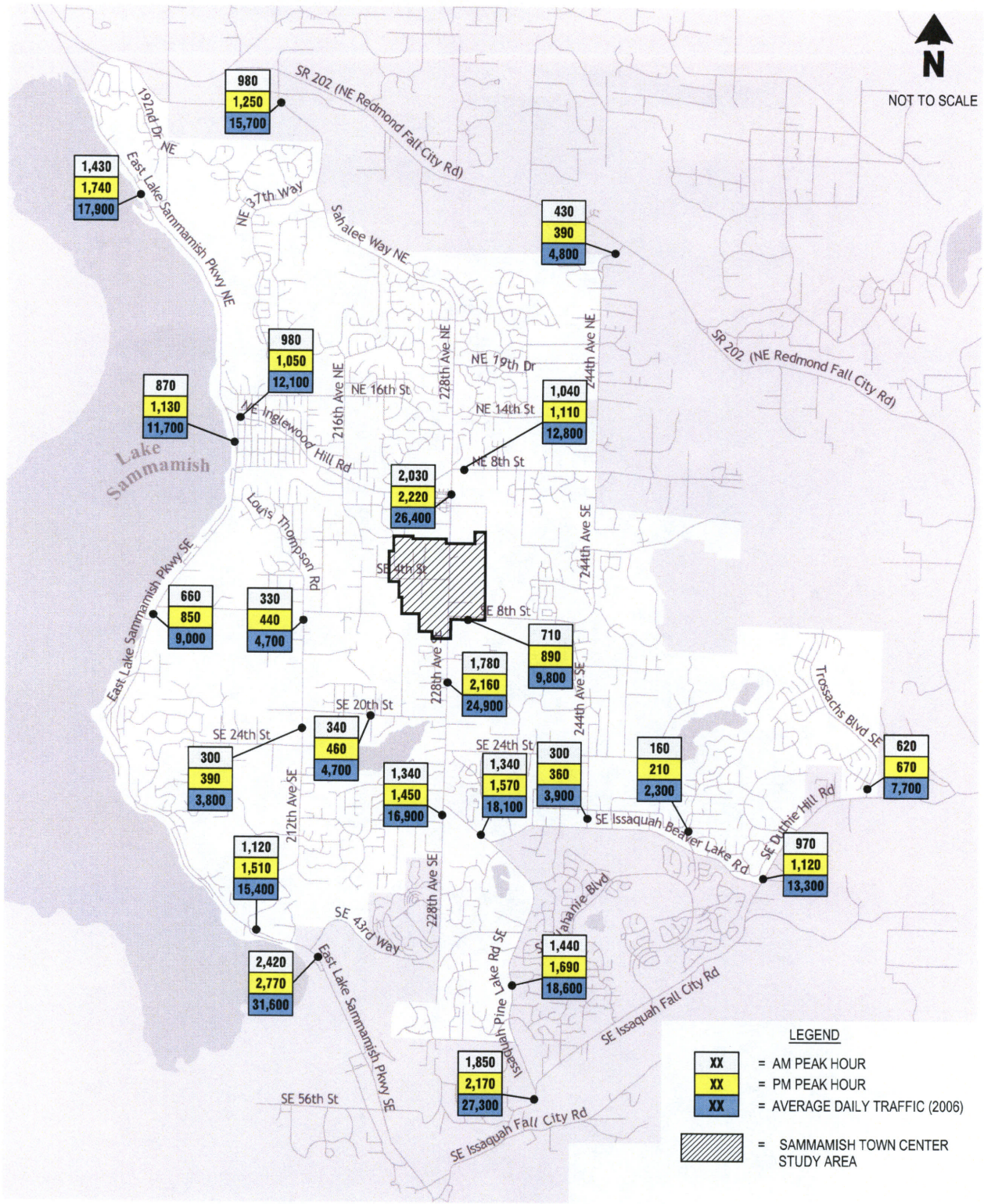
After discounting for the trips internalized within Town Center due to mixed-use effects, the remaining distribution pattern of "exported" trips away from Town Center travels in all directions, with a slightly larger share to the south than to the north. For Town Center Alternative 1, the distribution is 27% north on 228th, 34% south on 228th, 27% west on SE 4th, and 12% east on SE 8th.

The commercial component of Town Center attracts traffic from all directions on the plateau, roughly in proportion to the weight of residential population in each direction. There is also some commercially generated traffic to/from other commercial areas, which are found both north and south along 228th.

The residential component generates traffic that is connects to employment opportunities that are mostly outside Sammamish, and to commercial destinations located both within and outside Sammamish. Commuter trips split north and south depending on proximity to the external highway system. At Town Center, slightly more go south to I-90 versus north to SR-202/SR-520. Much of the remainder of residential trip generation is oriented to shopping centers within Sammamish, which are found in both directions from the Town Center area. Finally, there is travel from residences to other residential destinations all over the plateau, and to commercial and residential destination beyond city limits.

Attachment A

Updated Traffic Volumes (2006 Existing and Alternatives 1 – 4)



Existing 2006 Traffic Volumes

City of Sammamish Town Center Sub-Area Plan DEIS

The Transpo Group

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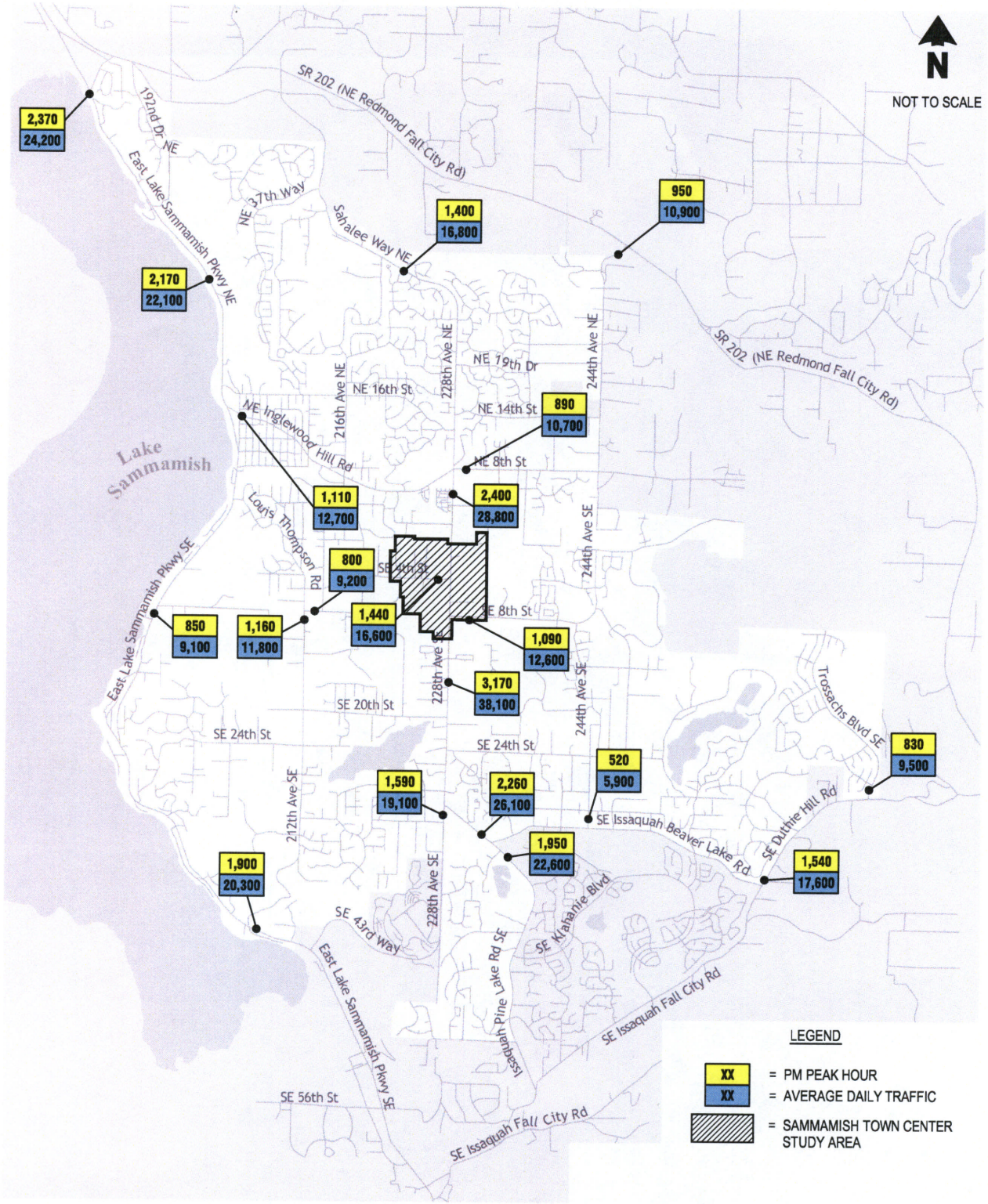

SOURCE: DEA Inc.

2030 Alternative 1 Traffic Volumes (Updated DEIS Figure 7-6)

City of Sammamish Town Center Sub-Area Plan DEIS

The Transpo Group

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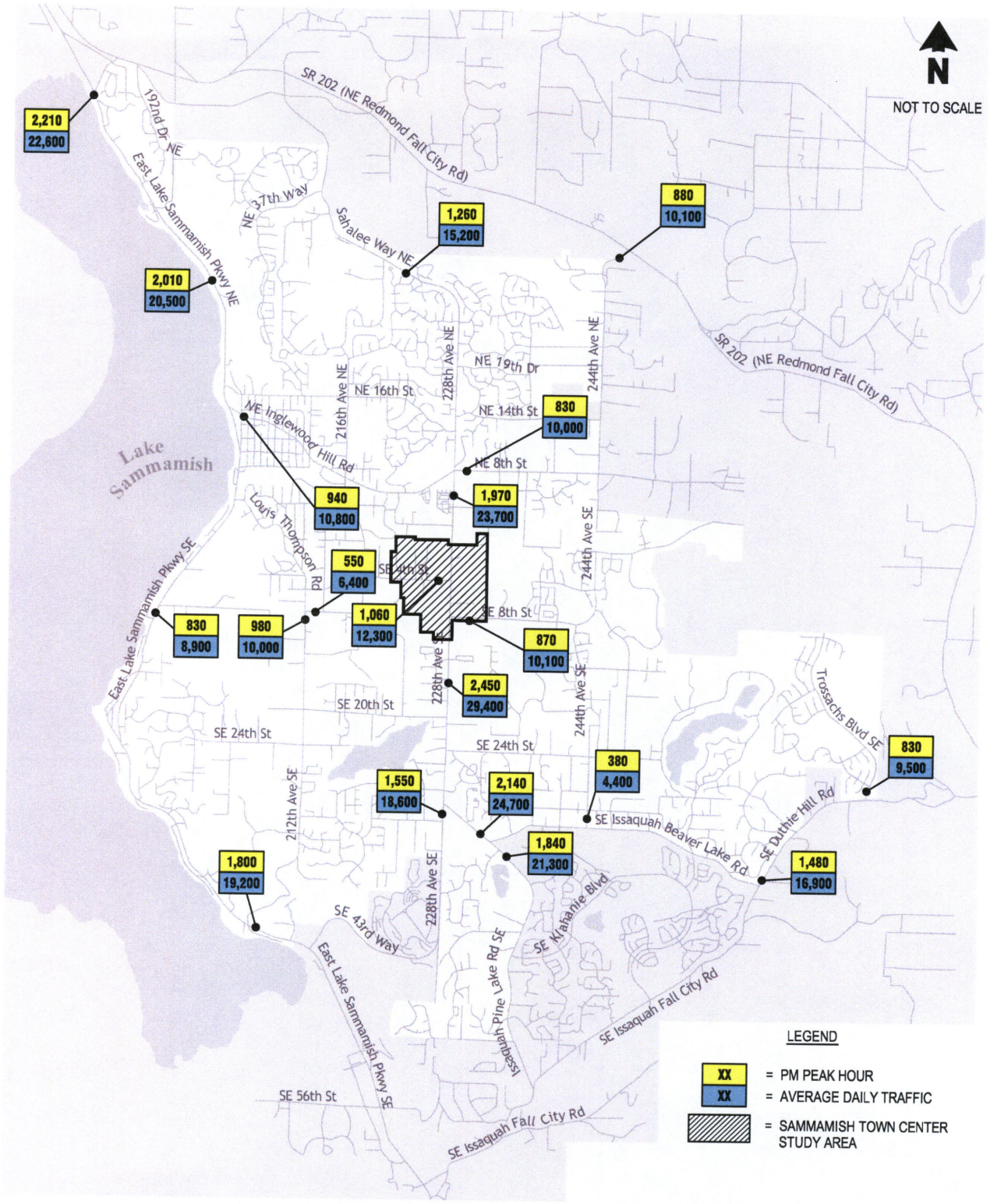

SOURCE: DEA Inc.

2030 Alternative 2 Traffic Volumes (Updated DEIS Figure 7–7)

City of Sammamish Town Center Sub–Area Plan DEIS

The Transpo Group

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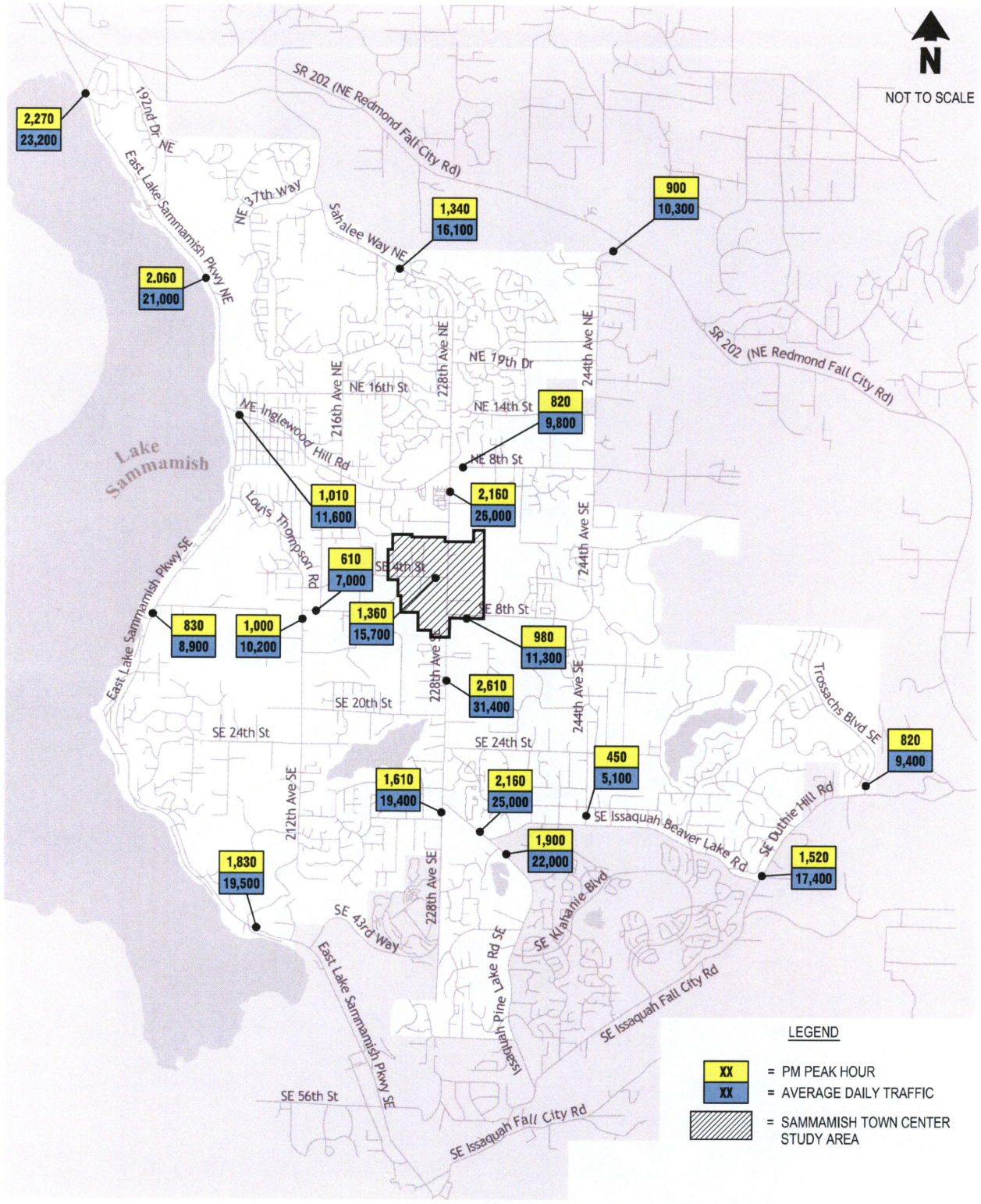

SOURCE: DEA Inc.

2030 Alternative 3 Traffic Volumes (Updated DEIS Figure 7-8)

City of Sammamish Town Center Sub-Area Plan DEIS

The Transpo Group

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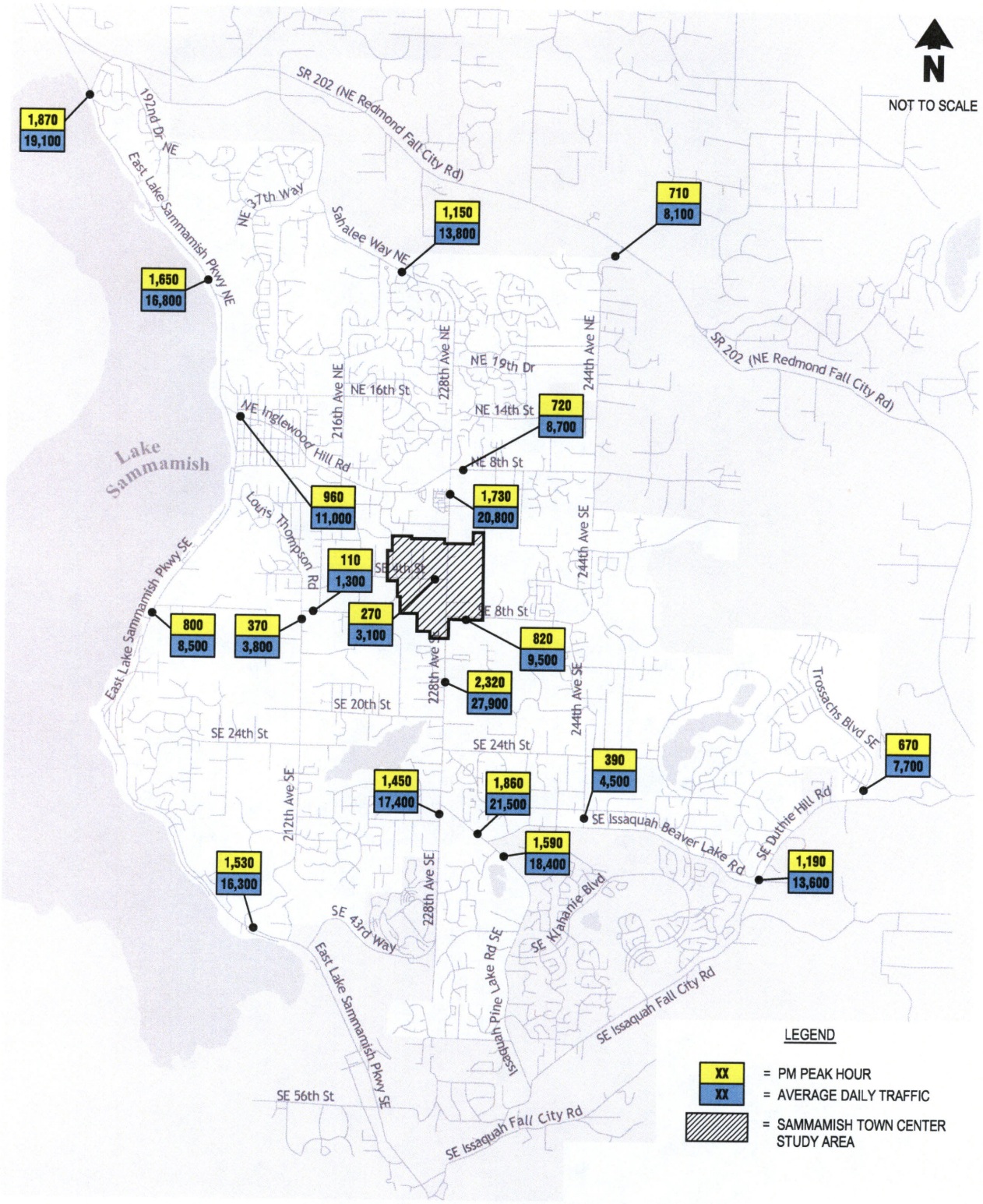

SOURCE: DEA Inc.

2030 Alternative 4 (No-Action) Traffic Volumes (Updated DEIS Figure 7-9)

City of Sammamish Town Center Sub-Area Plan DEIS

The Transpo Group

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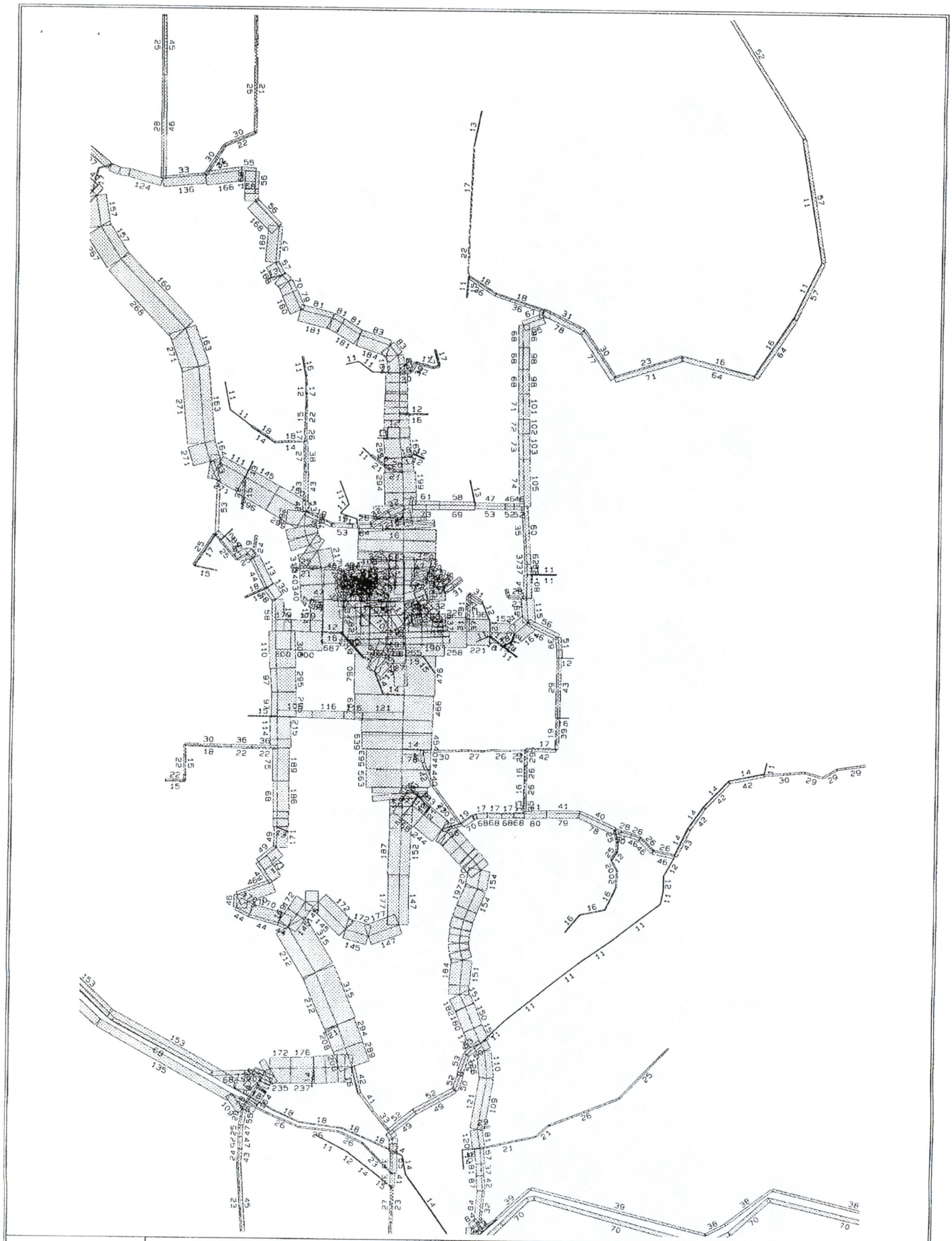
Attachment B

Total Trip Distribution (Alternatives 1 – 3)



TMODEL 2

Town Center Alt 1 rev Distribution

Sammamish Traffic Forecasting Model - 2030 PM Pk Hr

DAVID EVANS & ASSOCIATES, BELLEVUE, WA

TCALT1C.LLX
TCALT1.NDE

LL: 9500/14000
UR: 14000/21000
01-16-2007

TMODEL 2™

Town Center Alt 2 rev Distribution

Sammamish Traffic Forecasting Model - 2030 PM Pk Hr

DAVID EVANS & ASSOCIATES, BELLEVUE, WA

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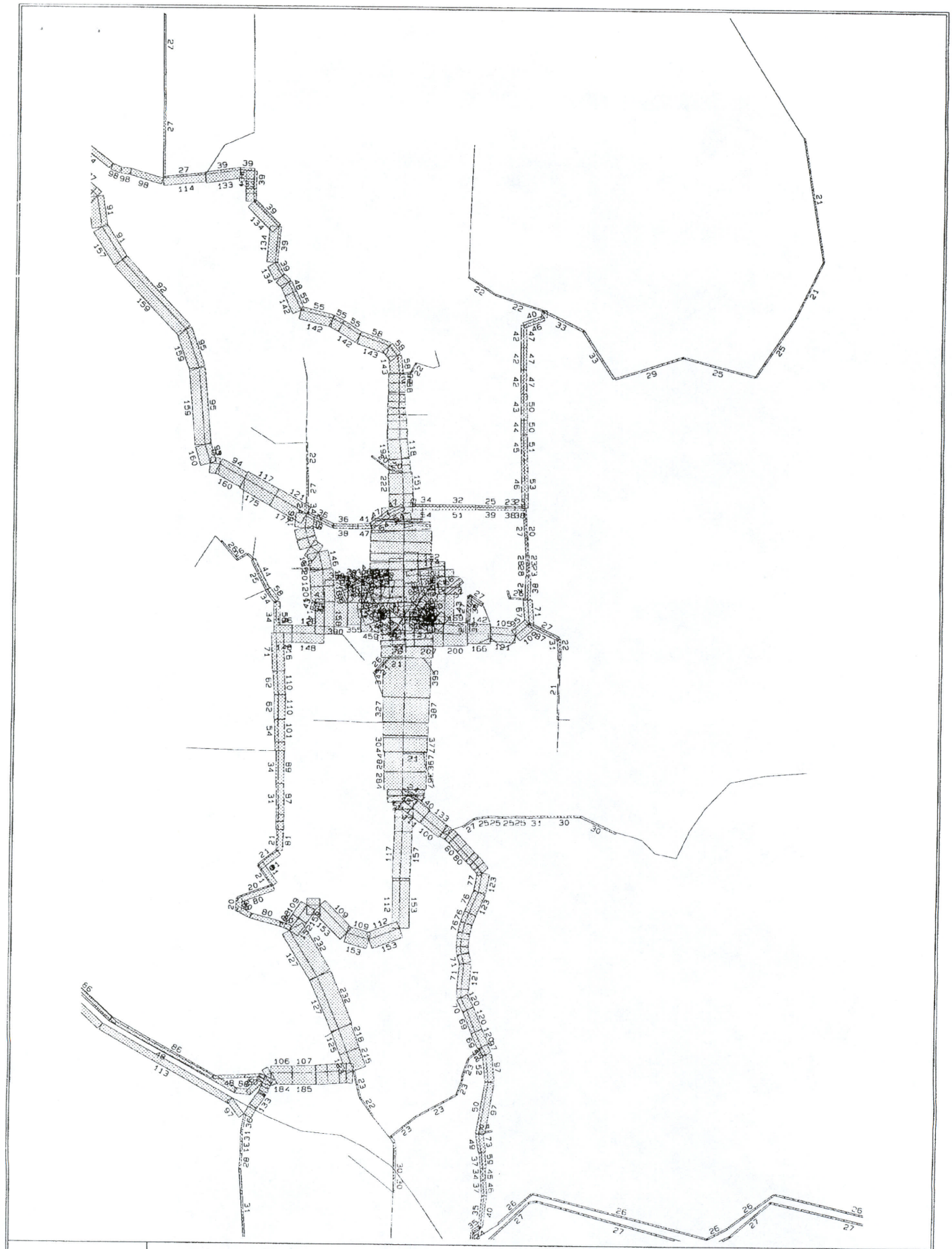
01-16-2007



TMODEL 2

Town Center Alt 3 rev Distribution

Sammamish Traffic Forecasting Model - 2030 PM Pk Hr

DAVID EVANS & ASSOCIATES, BELLEVUE, WA

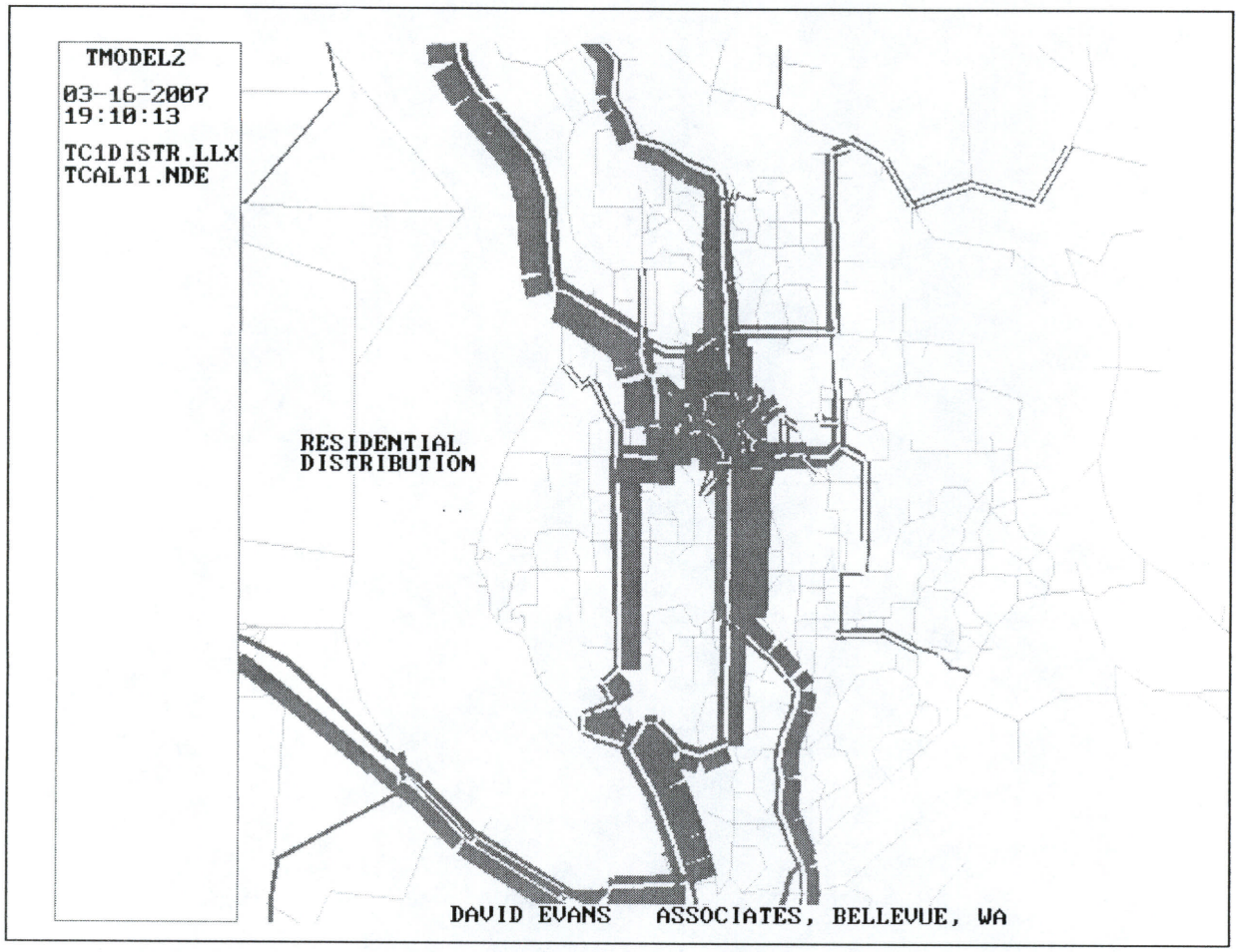
TCALT3C.LLX
TCALT3.NDE

LL: 9500/14000
UR: 14000/21000
01-16-2007

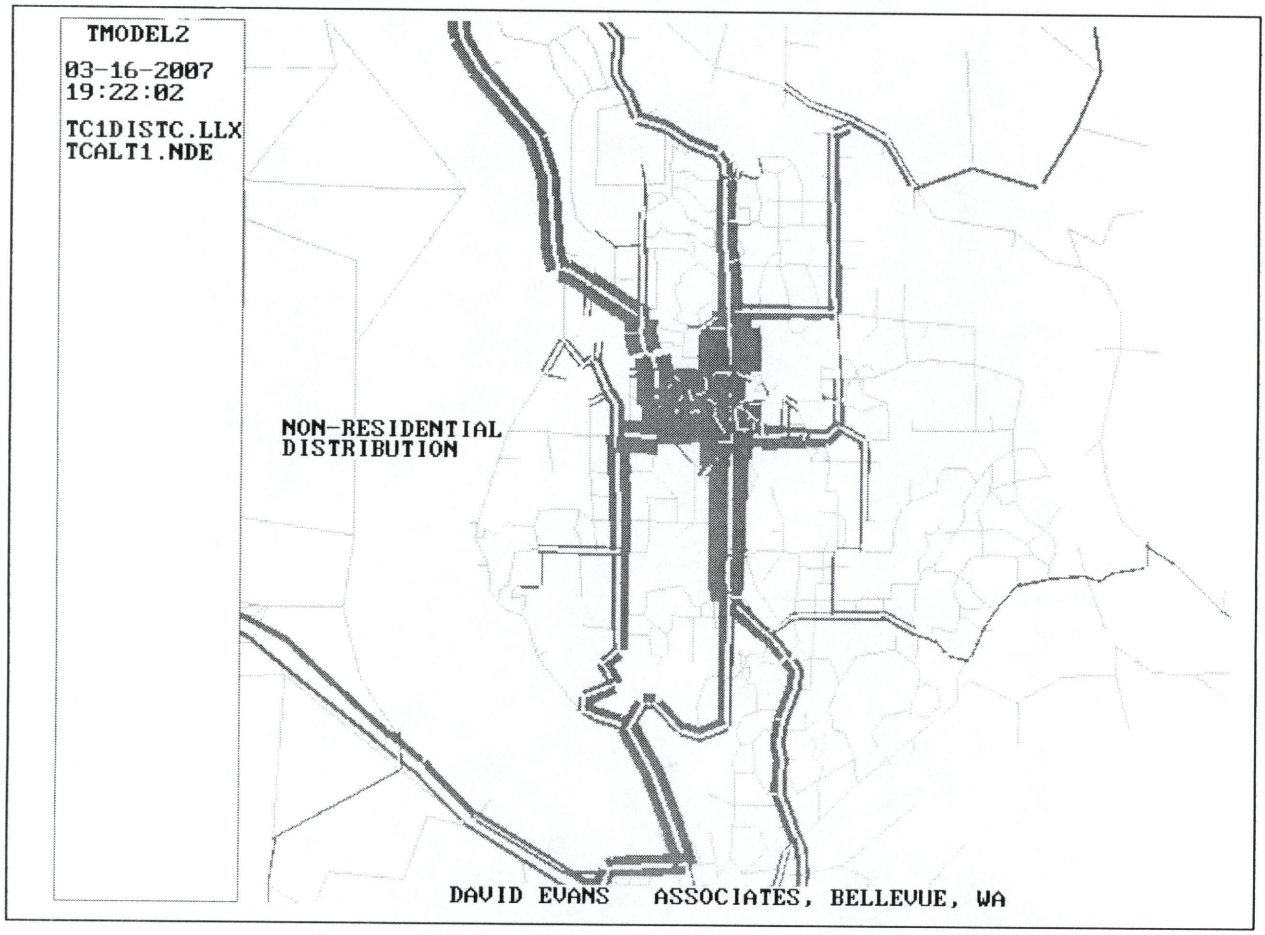
Attachment C

Trip Distribution by Land Use Type (Residential vs. Non-Residential)

Trip Distribution: Residential



Trip Distribution: Non – Residential



Attachment D

Existing 2006 Roadway Link Traffic Volumes

Existing 2006 AM-PM-Average Weekday Daily Trips (AWDT)

Location		Existing 2006				
		PM%	PM	AM%	AM	AWDT
E Lk Sammamish Pkwy NE	s/o 187th	9.7%	1,742	7.9%	1,425	17,949
E Lk Sammamish Pkwy NE	s/o Inglewood Hill Rd	9.7%	1,134	7.5%	871	11,650
E Lk Sammamish Pkwy NE	s/o SE 8th St	9.5%	849	7.3%	656	8,950
E Lk Sammamish Pkwy SE	n/o SE 43rd Way	8.8%	2,770	7.6%	2,415	31,610
E Lk Sammamish Pkwy SE	s/o 212th Way SE	9.8%	1,513	7.3%	1,118	15,366
212th Ave SE	s/o SE 8th St	9.4%	444	7.0%	330	4,740
212th Ave SE	s/o SE 20th St	10.2%	388	7.8%	295	3,799
NE Inglewood Hill Rd	e/o E Lk Samm Pkwy	8.7%	1,053	8.2%	984	12,050
SE 20th St	w/o 228th Ave SE	9.7%	461	7.2%	343	4,744
Sahalee Way NE	n/o NE 50th St	8.0%	1,251	6.2%	982	15,735
228th Avenue NE	s/o NE 8th St	8.4%	2,219	7.7%	2,025	26,404
228th Avenue SE	s/o SE 8th St	8.7%	2,162	7.2%	1,782	24,903
228th Avenue SE	n/o SE 32nd St	8.6%	1,381	7.9%	1,274	16,116
228th Avenue SE	s/o Issq Pine Lk Rd	8.6%	1,448	7.9%	1,337	16,905
NE 8th St	e/o 228th Ave NE	8.7%	1,105	8.1%	1,038	12,769
SE 8th St	e/o 228th Ave SE	9.1%	893	7.3%	714	9,831
Issq Pine Lk Rd SE	s/o 228th Ave SE	9.1%	1,689	7.7%	1,436	18,646
Issq Pine Lk Rd SE	n/o 32nd way	8.7%	1,568	7.4%	1,339	18,103
Issq Pine Lk Rd SE	at Highlands Drive	7.9%	2,165	6.8%	1,846	27,285
244th Ave NE	uninc, s/o SR 202	8.0%	387	8.9%	427	4,810
244th Ave NE	s/o SE 24th	9.3%	357	7.8%	301	3,853
SE Issq Bvr Lk Rd	w/o Duthie Hill Rd	9.0%	209	6.7%	155	2,328
SE Duthie Hill Rd	e/o Bvr Lk Rd	8.4%	1,116	7.3%	970	13,308
Trossachs Blvd SE	n/o Duthie Hill Rd	8.7%	665	8.0%	616	7,681

Model AM-PM-Average Weekday Daily Trips (AWDT) for all Alts

Segment #	Location		Alternative 1			Alternative 2			Alternative 3			Alternative 4		
				PM	ADT		PM	ADT		PM	ADT		PM	ADT
1	E Lk Sammamish Pkwy NE	s/o 187th	9.8%	2,370	24,200	9.8%	2,210	22,600	9.8%	2,270	23,200	9.8%	1,870	19,100
4	E Lk Sammamish Pkwy NE	s/o Inglewood Hill Rd	9.4%	1,270	13,500	9.4%	1,280	13,600	9.4%	1,270	13,500	9.4%	1,030	11,000
5	E Lk Sammamish Pkwy NE	s/o Thompson Hill Rd	9.4%	850	9,100	9.4%	830	8,900	9.4%	830	8,900	9.4%	800	8,500
6	E Lk Sammamish Pkwy SE	n/o SE 24th St	9.4%	790	8,400	9.4%	780	8,300	9.4%	780	8,300	9.4%	780	8,300
8	E Lk Sammamish Pkwy SE	s/o 212th Way SE	9.4%	1,900	20,300	9.4%	1,800	19,200	9.4%	1,830	19,500	9.4%	1,530	16,300
12	212th Ave SE	s/o SE 8th St	9.8%	1,160	11,800	9.8%	980	10,000	9.8%	1,000	10,200	9.8%	370	3,800
13	212th Ave SE	s/o SE 20th St	9.8%	870	8,900	9.8%	700	7,100	9.8%	740	7,500	9.8%	350	3,600
15	NE Inglewood Hill Rd	e/o E Lk Samm Pkwy	8.7%	1,110	12,700	8.7%	940	10,800	8.7%	1,010	11,600	8.7%	960	11,000
20	SE 20th St	w/o 228th Ave SE	8.7%	610	7,100	8.7%	610	7,000	8.7%	590	6,800	8.7%	430	5,000
22	Sahalee Way NE	n/o NE 25th	8.3%	1,200	14,400	8.3%	1,060	12,700	8.3%	1,130	13,600	8.3%	910	10,900
24	228th Avenue NE	s/o NE 8th St	8.3%	2,400	28,800	8.3%	1,970	23,700	8.3%	2,160	26,000	8.3%	1,730	20,800
25	228th Avenue SE	s/o SE 8th St	8.3%	3,170	38,100	8.3%	2,450	29,400	8.3%	2,610	31,400	8.3%	2,320	27,900
26	228th Avenue SE	s/o SE20th St	8.3%	3,320	39,900	8.3%	3,100	37,200	8.3%	3,190	38,400	8.3%	2,670	32,100
27	228th Avenue SE	s/o Issq Pine Lk Rd	8.3%	1,590	19,100	8.3%	1,550	18,600	8.3%	1,610	19,400	8.3%	1,450	17,400
28	NE 8th St	e/o 228th Ave NE	8.3%	890	10,700	8.3%	830	10,000	8.3%	820	9,800	8.3%	720	8,700
29	SE 8th St	e/o 228th Ave SE	8.7%	1,090	12,600	8.7%	870	10,100	8.7%	980	11,300	8.7%	820	9,500
32	Issq Pine Lk Rd SE	s/o 228th Ave SE	8.7%	2,260	26,100	8.7%	2,140	24,700	8.7%	2,160	25,000	8.7%	1,860	21,500
33	Issq Pine Lk Rd SE	s/o 32nd way	8.7%	1,950	22,600	8.7%	1,840	21,300	8.7%	1,900	22,000	8.7%	1,590	18,400
34	Issq Pine Lk Rd SE	n/o SE 48th St	8.7%	2,590	29,900	8.7%	2,510	29,000	8.7%	2,530	29,300	8.7%	2,230	25,800
35	244th Ave NE	uninc, s/o SR 202	8.7%	950	10,900	8.7%	880	10,100	8.7%	900	10,300	8.7%	710	8,100
39	244th Ave NE	s/o SE 24th	8.7%	520	5,900	8.7%	380	4,400	8.7%	450	5,100	8.7%	390	4,500
42	SE Issq Bvr Lk Rd	w/o Duthie Hill Rd	8.7%	560	6,400	8.7%	410	4,700	8.7%	470	5,400	8.7%	330	3,800
43	SE Duthie Hill Rd	e/o Bvr Lk Rd	8.7%	1,540	17,600	8.7%	1,480	16,900	8.7%	1,520	17,400	8.7%	1,190	13,600
45	Trossachs Blvd SE	n/o Duthie Hill Rd	8.7%	830	9,500	8.7%	830	9,500	8.7%	820	9,400	8.7%	670	7,700

Attachment E

Level of Service (LOS) and Traffic Volumes as Reported in the Eastside Catholic High School EIS

Table 4. Existing levels of service.

	AM Peak Hour			Noon Peak Hour			PM Peak Hour of School			PM Peak Hour of Adjacent Streets			Special Event Peak Hour		
Signalized Intersections	**LOS**	**Delay [a]**	**V/C**	**LOS**	**Delay [a]**	**V/C**	**LOS**	**Delay [a]**	**V/C**	**LOS**	**Delay [a]**	**V/C**	**LOS**	**Delay [a]**	**V/C**
SR 202 / East Lake Sammamish Parkway	F	80.8	1.00	–	–	–	D	37.5	0.66	D	42.0	0.84	–	–	–
SR 202 / 192nd Drive NE	B	13.5	0.82	–	–	–	A	6.4	0.64	A	7.7	0.75	–	–	–
SR 202 / Sahalee Way NE	C	27.7	0.86	–	–	–	C	29.6	0.88	F	104.4	1.13	–	–	–
NE 37th Way / Sahalee Way NE	A	9.1	0.56	–	–	–	A	7.6	0.43	A	9.0	0.53	–	–	–
NE 25th Way / Sahalee Way NE	B	14.4	0.55	B	10.0	0.41	B	11.9	0.50	B	12.2	0.51	B	11.0	0.52
NE Eighth Street (Inglewood Hill Road) / 228th Avenue NE	D	41.9	0.84	C	24.2	0.62	C	31.8	0.74	C	33.1	0.74	C	34.4	0.81
NE Fourth Street / 228th Avenue	C	32.8	0.80	B	16.5	0.65	E	71.1	0.98	B	18.2	0.75	B	18.4	0.72
SE Eighth Street / 228th Avenue SE	C	20.3	0.42	B	11.8	0.33	B	12.8	0.35	A	8.3	0.41	A	9.2	0.44
SE 20th Street / 228th Avenue SE	B	14.6	0.55	A	6.5	0.29	B	10.3	0.48	B	10.6	0.46	B	10.1	0.56
SE 24th Street / 228th Avenue SE	C	22.9	0.64	B	15.2	0.32	C	24.6	0.52	C	21.1	0.55	C	23.2	0.68
Issaquah-Pine Lake Road / 228th Avenue SE	C	32.5	0.83	C	22.4	0.39	C	29.4	0.52	C	22.6	0.50	B	14.4	0.47
Issaquah-Pine Lake Road / Issaquah-Fall City Road	C	29.5	0.72	–	–	–	B	17.4	0.65	B	17.7	0.72	–	–	–
SE 56th Street / East Lake Sammamish Parkway	E	66.0	1.08	–	–	–	C	34.8	0.81	D	44.7	0.87	–	–	–
SE 43rd Way / East Lake Sammamish Parkway	B	14.9	0.71	–	–	–	B	10.5	0.62	B	13.2	0.75	–	–	–
212th Way SE / East Lake Sammamish Parkway	B	12.0	0.68	–	–	–	A	5.1	0.40	A	5.1	0.50	–	–	–
Inglewood Hill Road / East Lake Sammamish Parkway	D	36.7	0.88	–	–	–	A	9.0	0.54	B	18.9	0.74	–	–	–
Unsignalized Intersections [b]	**LOS**	**Delay [a]**	**WM**	**LOS**	**Delay [a]**	**WM**	**LOS**	**Delay [a]**	**WM**	**LOS**	**Delay [a]**	**WM**	**LOS**	**Delay [a]**	**WM**
Main Street / 228th Avenue SE	C	18.5	WB	C	22.2	WB	C	24.6	WB	C	16.1	WB	E	39.6	WB
SE Fourth Street / 228th Avenue SE	C	21.4	EB	D	25.4	EB	D	25.0	EB	F	61.6	EB	E	38.5	EB
Louis Thompson Road / East Lake Sammamish Parkway	C	16.6	WBLT	–	–	–	C	22.2	WBLT	E	47.5	WBLT	–	–	–
SE 20th Street / 212th Avenue SE	B	11.2	WB	–	–	–	–	–	–	B	12.7	WB	–	–	–

EB – eastbound.
LOS – level of service.
V/C – volume-to-capacity ratio.
WB – westbound.
WBLT – westbound left turn.
WM – worst movement.
[a] Average delay in seconds per vehicle.
[b] LOS and delay are reported for the worst movement at unsignalized intersections.

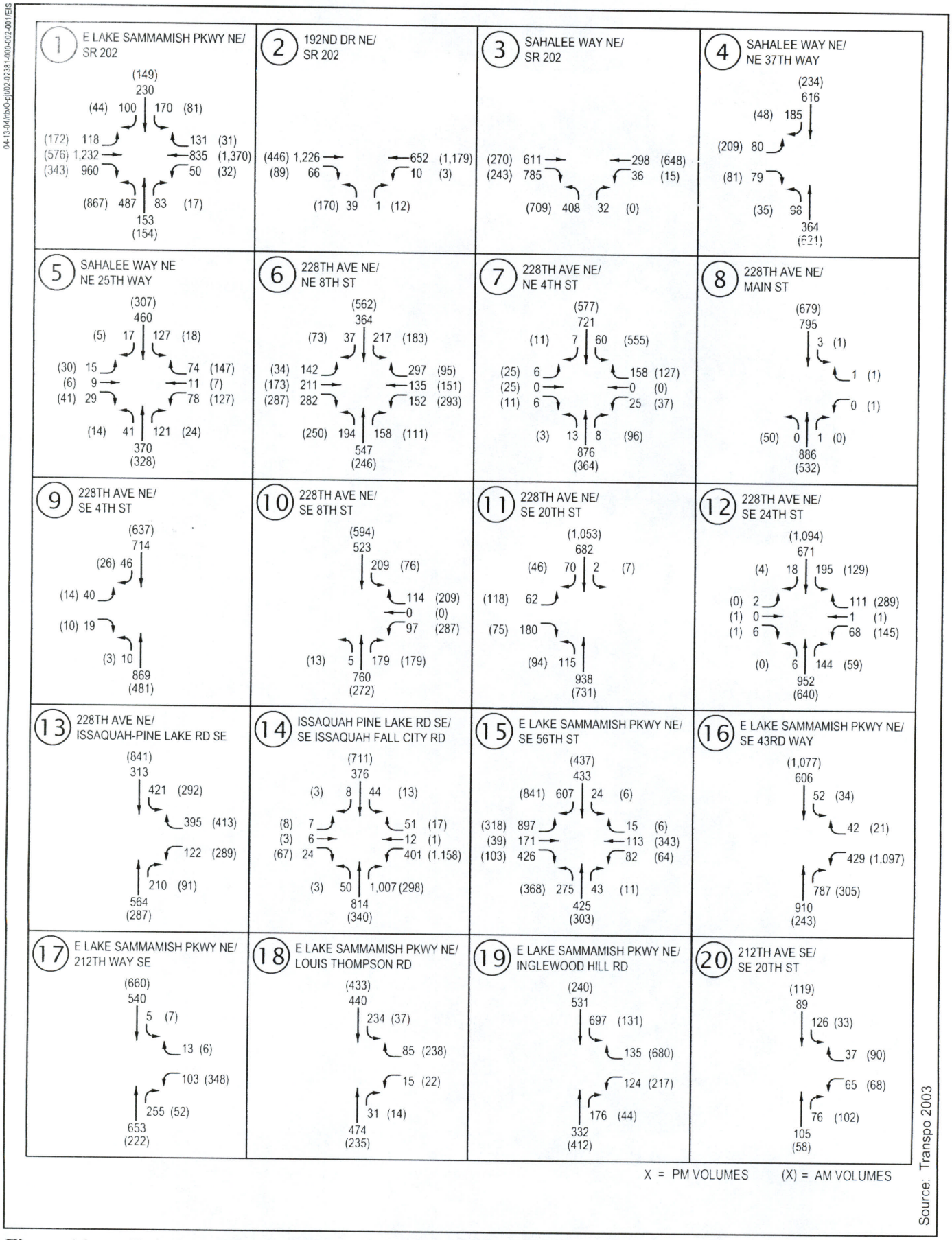


Figure 16. Existing AM and PM peak hour of adjacent street traffic volumes.

Attachment F

Joseph P. Savage Jr., P.E. Letter

MEMORANDUM

Date: March 8, 2007

To: Mr. Scott Hamilton

From: Joseph P. Savage, Jr., P.E.

Per your request, I have reviewed the information regarding the Draft EIS on the Sammamish Town Center, including your initial comment letter and the response from Dan McKinney of The Transpo Group. Although I have been away from Sammamish for over two years, I am still quite familiar with the City and the Comprehensive Plan.

To begin with Mr. McKinney is correct about the ITE Trip Generation estimate of about 10% of daily traffic to/from a single family residential development occurring in the peak hour is not a good estimate of the peak hour percentage of daily traffic on a given street in Sammamish. This is true because those streets carry a mix of residential and non-residential trips, and even the residential peak hour percentages would likely vary from one subdivision to another. Since all you had available for the "existing" traffic volumes were daily traffic, assuming a constant 10% factor is not inappropriate for a non-traffic engineer to begin reviewing the EIS document.

Since Mr. McKinney clearly states that the actual traffic modeling and analysis was conducted using PM peak hour volumes on street segments (links) and intersection approaches, then the EIS should provide the 2006 "existing" PM peak hour traffic volumes used in the EIS as the starting point for analysis. These volumes should be listed in tabular format at the 25 – 30 locations you identified for 2006, and for 2030 for each of the four alternatives (1-3 plus no action). Then one can compare "apples-to-apples." Although I agree with presenting estimated daily traffic volumes based on factoring from the modeled peak hour volumes, all analysis of levels of service at intersections and on street segments should be performed with peak hour rather than daily volumes. Clearly the PM peak hour volumes are readily available for 2006 and the alternatives since Transpo used that data.

I strongly disagree with Mr. McKinney's assertion that "The PM Peak hour intersection operations [I believe he means the LOS calculations] were based on intersection volumes and not the PM peak hour link volumes shown in the figures. So, the operational analysis will not change or be impacted by updating these figures." [Emphasis added.] First, the sums of the traffic volumes entering and leaving a given intersection should reasonably match the directional peak hour link volumes feeding the four legs of the intersection. Thus, there should be a good correlation between the link volumes and the intersection volumes; they are not independent as Mr. McKinney implies. Second, if a comparison of the link volumes between 2006 and 2030, and across the 2030 alternatives, yields questionable results, then both intersection and link volumes should be rationalized.

Looking past the 10% peak hour assumption, your table of 2002, 2006 and 2030 daily traffic volumes appropriately raises significant questions about the accuracy and reliability of the Sammamish traffic model and Transpo's application of it for this DEIS. Mr. McKinney offers no explanation of why the 2002/3 and 2006 daily traffic volumes are different, nor does he explain why 2030 daily traffic volumes on some streets are less than the 2002/3 counts. These

are appropriate questions to be addressed in an EIS, and on their face raise valid questions about the reasonableness of the model results and the conclusions drawn from them.

Having lived in Eagle Ridge adjacent to East Lake Sammamish Parkway (ELSP) for nearly 20 years, and having conducted extensive forensic analysis of the King County traffic models, it is inconceivable to me that ELSP would have such little growth in traffic between 2006 and 2030 – about 1% per year for Alternative 1 and less for the other alternatives. For the No Action Alternative, the analysis shows an actual decline in traffic on ELSP at Weber Point and at SE 8th Street. Similarly, 2030 volumes are projected to be less than 2006 volumes on Inglewood Road, NE 8th, NE 228th, etc. for one or more alternatives or no action. Unless there is a recession in the Puget Sound region, it is not reasonable to expect such declines or low growth situations.

Again, these trends raise serious questions about the reasonableness of the Sammamish traffic model or about Transpo's application of it.

"Calibration" of the traffic model is referenced several times by Mr. McKinney. Is a model calibration report available? Does the model meet FHWA model calibration/validation standards? This information would have been prepared by the model developers (DEA?); I would not expect Transpo to revalidate/recalibrate the model but rather to simply apply what they had been given to work with. Therefore, the questions I raise probably pertain more to the original model rather than Transpo's application of it to the Town Center proposal.

A quick check of the overall validity of the Sammamish model would be to draw a "cordon line" around the city and tally the actual base year traffic counts, then do the same for the 2030 no action alternative and see if the comparison makes sense in relation to projected population and employment growth in Sammamish between the base year and 2030. If the results of that check are not reasonable (i.e., growth of total traffic crossing the cordon line approximates growth in population and employment), then clearly the results of the analysis conducted for the Town Center proposal using that model cannot be relied upon as the basis for a decision on Town Center alternatives by the City.

In closing, the points that you raised in your table and in your list of questions are valid points and deserve an adequate response. The unreasonableness of the traffic model projections for 2030 in comparison to 2006 cause me to question the validity of the entire analysis and results presented in the Draft EIS, even though the problems may lie with the City's traffic model and not the project-specific analysis for the Town Center alternatives. These questions can be addressed by providing the 2006 PM peak hour volumes alongside the forecast 2030 PM peak hour volumes, and the reasonableness of their relationships determined.

Other points, such as the varying PM peak hour percentages by location and by alternative, also deserve attention, but not until the overall reasonableness of the traffic modeling is assured.