

**TRANSPORTATION ELEMENT
of the
ENVIRONMENTAL IMPACT STATEMENT
for the proposed plats of
OLD MILL POINT
WEBER'S RIDGE
and
CHRYSALIS ESTATES**

March 17, 1995

**Client(s): Mr. William Nelson, Old Mill Point
 Ms. Donna Dixon, Weber's Ridge
 Mr. Jack Estep, Chrysalis Estates**

INTRODUCTION

The following report was prepared to address the transportation elements of the environmental impact statement for the proposed plats of Old Mill Point, Weber's Ridge, and Chrysalis Estates. Since the three plats are contiguous, served by the same street network, and anticipated to be developed in the same time horizon, a joint report was prepared.

King County requested the analysis address the following elements:

Affected Environment

1. Conduct a Level Two traffic study, per King County requirements.
2. Discuss the existing road system in the study area, including NE 37th Way, 192nd Place NE, Sahalee Way, and SR 202. Generally describe existing traffic patterns in the site vicinity.
3. Provide current AM and PM peak hour traffic counts and LOS calculations at:
 - SR 202/192nd Avenue NE
 - NE 37th Way/Sahalee Way

Impact Analysis

1. Provide traffic volume projections northwest of the site, through Hidden Ridge, and east of the site through Timberline. Traffic projections must consider background, pipeline and diverted traffic from residential developments east and northwest of the proposed projects.
2. Compare traffic volumes for the Proposal and Design Alternative at the following locations:
 - 192nd Avenue NE/SR 202
 - 192nd Avenue NE @ NE 45th Place
 - Between Old Mill Point and Weber's Ridge
 - NE 42nd Street @ 201st Avenue NE
 - NE 42nd Street @ NE 39th Street
 - 204th Avenue NE @ NE 38th Place
 - NE 37th Way @ 204th Court NE
 - NE 37th Way/Sahalee Way
3. Conduct a signal warrant analysis at the intersection of SR 202 and 192nd Avenue NE.
4. Discuss the need for through access for the proposed plats as related to King County's 100-lot rule. Describe safety issues associated with the through access for the proposal and the provision of emergency services with no through access for Design Alternative.

5. Describe the status of any road variances, including but not limited to, variances from standards for maximum grade, minimum stopping and entering sight distance, minimum radius for horizontal curves and maximum cul-de-sac length.
6. Discuss any additional adverse impacts identified by the consultant and/or the County.
7. The intersection of East Lake Sammamish Parkway and SR 202 is currently operating at LOS F and the intersection of 187th Avenue NE and SR 202 is projected to operate at LOS F in 1995. Provide trip distribution information between East Lake Sammamish Parkway and 192nd Avenue NE and quantify impacts on these two intersections.

Mitigating Measures

1. Discuss proposed mitigating measures for traffic, public access and road design issues.
2. Discuss other mitigating measures identified by the consultant.

AFFECTED ENVIRONMENT

Level Two Traffic Study

The requirements of the Level Two traffic study are presented in the Appendix. The required data is presented in the following outline. The Level Two Study however, is limited to an analysis of the proposed action. As such, the study assumes a new route connecting the existing Timberline neighborhoods to Hidden Ridge. Impacts of the alternative are discussed under the **Impact Analysis** section.

I. Project Identification

- | | |
|--------------------------------|---|
| A. Project Name(s): | Old Mill Point
Weber's Ridge
Chrysalis Estates |
| B. Project(s) Location: | The plat(s) are located in King County on the east side of East Lake Sammamish Parkway between 196th Avenue NE and 187th Avenue NE as shown in Figure 1. |
| C. Developer Name(s): | Mr. William C. Nelson, Old Mill Point
Ms. Donna Dixon, Weber's Ridge
Mr. Jack Estep, Chrysalis Estates
c/o Mr. De-En Lang
Subdivision Management, Inc.
16031 119th Place NE
Bothell, WA 98011
Phone Number: 488-1111 |
| D. Development Description(s): | Old Mill Point
1) Site Area = 60.15 acres
2) Lots = 79
3) Zoning = RS 15000 |

Weber's Ridge

- 1) Site Area = 11.79 acres
- 2) Lots = 28
- 3) Zoning = RS 15000

Chrysalis Estates

- 1) Site Area = 14.78 acres
- 2) Lots = 16
- 3) Zoning = RS 15000 SC

Home construction should logically begin in 1997 with the plat of Old Mill Point. However, Chrysalis Estates could start prior to Old Mill Point if utilities are in place. All homes are expected to be complete by 1998. For the purposes of this analysis, the horizon year or full occupancy of these developments is anticipated to be 1999. A site plan is shown in Figure 2.

II. Trip Generation

Trip generation in the horizon year includes traffic generated from the proposed plats, pipeline projects, and growth of existing AM and PM peak hour arterial traffic volumes based on historical growth rates.

A. Existing Traffic

Existing background traffic volumes were determined from actual peak period counts taken at the analysis intersections during December 1993 and January 1994. Existing peak hour volumes are presented in Figure 3.

B. Background Traffic Growth

Historical Growth

Historical growth in PM peak hour traffic was evaluated for the surrounding arterial network. Based on the historical growth rates obtained from WSDOT, existing volumes on SR 202 between 192nd Avenue NE and Sahalee Way NE will grow at a rate of 3 percent per year. Traffic volumes on Sahalee Way NE will grow at a rate of 6 percent per year based on historical counts supplied by King County.

Pipeline Projects

King County staff indicated there were two pipeline projects in the vicinity of the proposed plats. The two pipeline projects include Sterlingwood (62 SF dwelling units) and Timberline Ridge (232 SF dwelling units) located south and east of the proposed plats. In addition, a field review indicated that Hidden Ridge, a previously approved 90 lot plat, located north of the proposed plats, has 55 homes left to occupy. The location of the pipeline projects is shown in Figure 4. Trip generation for the pipeline developments is presented in Table 1.

C. Project Traffic

Vehicle trip generation for the three plats, as well as the pipeline projects with exception of Timberline Ridge, was calculated using data published by the Institute of Transportation Engineers in the *Trip Generation Report* 5th Edition, 1991, under Land Use Category 210, Single Family. Timberline Ridge data was

obtained from the Timberline Ridge FEIS dated September 1990. The results of the trip generation calculations for the three plats is presented in Table 1.

**Table 1
Trip Generation**

Land Use	AWDT	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
Old Mill Point 79 Lots	754	58	15	43	80	51	29
Weber's Ridge 28 Lots	267	21	5	16	28	18	10
Chrysalis Estates 16 Lots	153	12	3	9	16	10	6
<i>Total</i>	<i>1,174</i>	<i>91</i>	<i>23</i>	<i>68</i>	<i>124</i>	<i>79</i>	<i>45</i>
<u>Pipeline Projects</u>							
Timberline Ridge ¹ 232 Lots	2,216	172	45	127	234	150	84
Sterlingwood 62 Lots	665	46	12	34	63	40	23
Hidden Ridge 55 Additional Lots	595	41	11	30	56	36	20
<i>Total</i>	<i>3,526</i>	<i>259</i>	<i>68</i>	<i>191</i>	<i>353</i>	<i>226</i>	<i>127</i>
Grand Total	4,700	350	91	259	477	305	172

¹ Timberline Ridge trip generation obtained from Timberline Ridge FEIS September 1990.

III. Trip Distribution and Traffic assignment

A. Project and Pipeline Developments

Trip distribution percentages applied to traffic volumes generated from the proposed plats and pipeline projects were based on existing traffic patterns determined from existing AM and PM peak hour turning movement counts at the analysis intersections. The external area trip distribution was further stratified based on patterns obtained from the King County traffic model used for the East Sammamish Community Plan.

Traffic assignment was based on minimum travel time path criteria. Minimum travel time routing is the traditional path selection technique used for traffic assignment to street networks and is based on the assumption motorists seek to minimize travel time in their daily trips. The minimum travel time routings were determined from actual AM and PM peak period travel time runs conducted between the Timberline neighborhoods and the City of Redmond. For segments of roadway not yet constructed, an average speed of 20 MPH was assumed, although adjustments were made for the various grades encountered.

Based on the travel time calculations, project generated traffic with northerly destinations was assigned to the SR 202/192nd Avenue NE intersection, whereas traffic with southerly destinations was assigned to the NE 37th Way/Sahalee Way NE intersection. For pipeline projects, the north 60 percent of Timberline Ridge was assigned to NE 37th Way/Sahalee Way NE for all destinations, whereas the lower 40 percent was assigned to the NE 37th Way/Sahalee Way NE intersection for all trips destined to the north and to NE 16th Street and other routes to the south for southerly destinations. Traffic assignment for the plat of Sterlingwood was accomplished based on the same assumptions as the lower 40 percent of Timberline Ridge.

B. Traffic Diversion

As a part of the project, a new roadway will be provided from NE 42nd Street to 193rd Avenue NE connecting the Timberline Park neighborhood to Hidden Ridge. With this connection, a new route will be provided from the Timberline neighborhoods to SR 202. In addition, when the plat of Timberline Ridge is complete, a new north/south connection will be provided connecting the Timberline neighborhoods to the proposed plat of Sterlingwood and the existing plat of Shannonwood. With the new connections, existing traffic is expected to divert from existing routes to the new connections.

Using the results of the travel time studies discussed above, anticipated diversion of existing traffic through the proposed plats was calculated. The diversion point for existing Timberline traffic is approximately 1,040 feet northwest of the NE 37th Way/205th Place NE intersection within the plat of Timberline No. 1. It is assumed that Timberline residents living north of this point will use the new connection for northbound trips. Southbound trips will still be served via NE 37th Way to the Sahalee Way NE intersection. Of course, minimum time path selection assumptions are theoretical and as such an argument can be made that some trips originating south of this point will proceed north to the SR 202/192nd Avenue NE intersection for trips to the north and conversely trips originating north of this point may use NE 37th Way for trips to the north. However, for the purpose of this analysis, the selection of an exact point is necessary to quantify anticipated diversion.

Based on AM/PM peak period travel time calculations, it was determined that 66 AM and 56 PM peak hour trips from the Timberline neighborhoods will use the new connection through the proposed plats. From a travel time standpoint, traffic generated from the pipeline plats of Timberline Ridge and Sterlingwood will not benefit by using the proposed connection to 192nd Avenue NE and will most likely continue to use NE 37th Way for all trips.

Similarly, AM/PM peak hour travel time studies were done to estimate the volume of Hidden Ridge traffic with southerly destinations that will use the new connection through the plats to access NE 37th Way. Based on these studies, it was estimated that 3 AM and 4 PM peak hour trips from Hidden Ridge will use the new connection.

Also, with the completion of Timberline Ridge and Sterlingwood, an alternative route will be provided for traffic generated in the existing plat of Shannonwood. Similar travel time studies were done as a part of the Timberline Ridge analysis to determine anticipated traffic diversion. As a result, it was estimated that a portion

of the Shannonwood traffic will use the NE 37th Way intersection when the north/south route through Timberline Ridge/Sterlingwood is complete.

In addition to the trips traveling to and from the neighborhoods, intra Timberline area trips will also benefit from the proposed connection which connects the existing Timberline and future Timberline Ridge/Sterlingwood neighborhoods with the existing Hidden Ridge and proposed plats. These trips would include social/recreational, delivery service, e.g. postal service and newspaper delivery, ridesharing opportunities such as carpools and vanpools, and any other trips generated for typical neighborhood interactions. Without the proposed connection, interaction between these neighborhoods will be severely restricted. For those trips which are required e.g., postal and newspaper delivery, inefficient circulation patterns will be required resulting in wasted time and resources.

C. Project Impacts

When the three proposed plats are fully developed, it is estimated that they will generate 27 AM and 37 PM peak hour trips, or approximately 356 vehicle trips per day, through the existing Timberline neighborhoods to access Sahalee Way NE via NE 37th Way. The three proposed plats will also generate 64 AM and 86 PM peak hour trips, or approximately 818 vehicles per day, on 192nd Place NE through the Hidden Ridge neighborhood.

In summary, with the addition of the proposed plats, a new route connecting NE 42nd Street to 192nd Avenue NE will be provided. In addition, with the completion of the pipeline plats of Timberline Ridge and Sterlingwood, a new north/south connection (205th Place NE) will be provided from NE 37th Way to NE 16th. Although the pipeline development and two new connections will result in an increase in traffic volumes on NE 37th Way west of Sahalee Way NE and 192nd Avenue NE south of SR 202, the net impact of the project will be a reduction of traffic on NE 37th Way and an increase on 192nd Avenue NE. A summary of the peak hour volume impacts at each intersection are presented in Table 2.

**Table 2
Intersection Impacts**

Intersection	ADDITIONAL TRAFFIC IMPACTS	
	AM Peak (vph)	PM Peak (vph)
NE 37th Way west of Sahalee Way		
<u>New Trips</u>		
Proposed Plats (3)	27	37
Timberline Ridge	153	202
Sterlingwood	30	38
<u>Diverted Trips</u>		
Hidden Ridge	3	4
Existing Timberline Neighborhood	-66	-56
Shannonwood ^c	24	34
Impacts from project and connection ^a	-36	-15
Overall Impact ^b	171	259
192nd Avenue NE south of SR 202		
<u>New Trips</u>		
Proposed Plats (3)		86
Hidden Ridge (55 lots)	39	53
<u>Diverted Trips</u>		
Existing Timberline Neighborhood	66	56
Hidden Ridge	-3	-4
Impacts from project and connection ^a	127	138
Overall Impact ^c	166	191

^a Includes project trips and diversion from Hidden Ridge and existing Timberline developments
^b Includes all new trips and diverted trips
^c Diverted as a result of completion of Timberline Ridge and the ring road south

The 1999 AM and PM peak hour background traffic volumes, which include historical growth plus traffic generated by the pipeline projects plus diverted Shannonwood traffic, is presented in Figure 5. Project traffic volumes for the AM and PM peak hour are presented in Figure 6, and the 1999 AM and PM background, plus project, plus traffic diverted with the new connection through the plats is presented in Figure 7.

It should be noted that the AM peak hour volume for the eastbound right turn at the SR 202/192nd Avenue NE intersection is lower in 1999 for both the background and with project conditions than it is in 1994. The existing AM peak hour volumes are higher than would be realized with ITE rates based on full occupancy of Hidden Ridge. This results from the current level of construction activity in the plat. The contribution of the Old Redmond/Fall City Road which intersects with 192nd Avenue NE immediately south of the SR 202 intersection is

considered to be negligible. To account for this condition, the entering and exiting volumes for the AM peak hour condition were adjusted to reflect traffic volumes that would be anticipated with full development of Hidden Ridge. These volumes were calculated using ITE rates.

IV. Site Services Inventory

A. Roadways

East Lake Sammamish Parkway is a north-south principal arterial connecting between SR 202 and I-90. In the vicinity of the project, East Lake Sammamish Parkway is a 20-foot two-lane concrete road with 5-8 foot gravel shoulders except at recently improved intersections where the roadway is widened and shoulders are paved. South of SE 43rd Way, the road widens to 4 lanes with curb, gutter, and sidewalks. Between SE 56th and Vaughn Hill Road, the road is again a 20 foot two lane concrete road with 5-8 foot gravel shoulders.

SR 202 (Redmond-Fall City Road) is a principal arterial that extends east and west connecting Sahalee Way NE to SR 520 in the vicinity of the project. East of East Lake Sammamish Parkway, SR 202 is a 22-foot two-lane concrete road with 5-8 foot gravel shoulders.

Sahalee Way NE/228th Avenue NE is a principal arterial extending north and south between SR 202 and the Pine Lake Plateau area to the south. Sahalee Way has two 11-foot lanes with one 8-foot paved shoulder and one 8-foot gravel shoulder.

Currently, NE 37th Way, a neighborhood collector provides principle access to all of the Timberline developments. It has curb and gutter on both sides and a sidewalk on the north side connecting the existing Timberline developments to Sahalee Way NE. The roadway itself is 36 feet wide, allowing adequate width (6 to 8 feet) for cyclists on each side.

192nd Avenue NE is a neighborhood collector providing access to Hidden Ridge. It is a new roadway approximately 32 feet wide, it has curb, gutter and sidewalks on both sides. In anticipation of the future southerly extension of 192nd Avenue NE to serve additional development, the lots within Hidden Ridge were designed such that direct access to 192nd Avenue NE was not provided with the exception of a couple of lots. In these cases joint access was provided.

B. Transit, Pedestrian, and Bicycle Facilities

Transit service to the area is provided by the Municipality of Metropolitan Seattle (METRO). The current route servicing the area is Route 269. Route 269 provides two way AM and PM peak hour service between the Redmond Park 'n Ride and Issaquah Park 'n Ride Lots via SR 202/Sahalee Way/228th Avenue NE/Issaquah-Pine Lake Road/Issaquah-Fall City Road/East Lake Sammamish Parkway/SE 56th/Renton-Issaquah Road. Service is provided during the morning from 5:30 AM to 8:00 AM with 4 trips and again in the afternoon from 4:00 PM to 7:00 PM with 5 trips. There are no improvements to this service planned at this time.

There are no sidewalk or pedestrian facilities along any of the arterial routes serving the site. However, the width of the shoulders allows adequate walking space for pedestrians, although it is somewhat unprotected. Sidewalks however,

will be provided throughout the three plats. A pedestrian pathway will also be provided from Old Mill Point to East Lake Sammamish Parkway.

Although bicycle traffic can be accommodated adequately where shoulders are paved, a King County document published in 1983 entitled *Bicycling in King County* identifies bike routes on East Lake Sammamish Parkway, SR 202 and 228th Avenue NE in the vicinity of the proposed plats.

V. Level of Service

Level of service was calculated using the 1985 Highway Capacity Manual techniques for the 1994 existing, 1999 "without project", and 1999 "with project" conditions for the AM and PM time periods at the intersections of SR 202/192nd Avenue NE and NE 37th Way/Sahalee Way NE. The results of the level of service analysis for the three time periods are presented in Table 3.

Table 3
Level of Service

Intersection	Existing		1999 w/o Project		1999 w/Project	
	AM	PM	AM	PM	AM	PM
<u>SR 202/192nd Avenue NE</u>						
Northbound Left-turn	E	E	F	E	F	F
Northbound Right-turn	A	D	A	D	A	D
Westbound Left-turn with Signal	A	C	A	D	A	D
	-	-	-	-	D ¹	D ¹
					A ²	A ²
<u>NE 37th Way/Sahalee Way NE</u>						
Eastbound Left-turn	E	E	F	F	F	F
Eastbound Right-turn	A	A	A	C	A	C
Northbound Left-turn with Signal	A	A	A	B	A	C
	-	-	-	-	B	B

¹ Existing intersection configuration with signal; level of service applies to overall intersection.

² Assuming a 5-lane section on SR 202; level of service applies to overall intersection.

The results of the level-of service analysis indicates the critical movement at both intersections is the side street left turn. For the existing condition, the side street left turn at SR 202/192nd Ave NE and NE 37th Way/Sahalee Way NE will operate at LOS E for both the AM and PM peak hour.

For the 1999 horizon year, without the project, the sidestreet left-turn movement at each analysis intersection will operate at LOS F during the AM peak hour, whereas during the PM peak, the eastbound left-turn at NE 37th Way/Sahalee Way NE will operate at LOS F and the northbound left-turn at SR 202/192nd Avenue NE will operate at LOS E. For the "with project" condition, these critical movements will operate at LOS F for both the AM and PM peak hour. According to King County Adequacy Standards 21.49.03 KCC, "A calculated LOS F shall be considered inadequate. A calculated LOS E shall be considered undesirable but tolerable. A calculated LOS D or better shall be considered desirable." Based on County code,

the level of service at both analysis intersections with the project is considered inadequate.

To mitigate the level of service problems in 1999 under the "with project" condition, specific capacity enhancements were evaluated. With the widening of SR 202 to four lanes, as currently proposed by the WSDOT, the intersection of 192nd Avenue NE will continue to operate at LOS F based on the level of service for the side street (192nd Avenue NE) left turn. However, with the addition of a signal, as well as the four lane widening of SR 202, the intersection will operate at LOS A for both the AM and PM peak hour condition. Without the anticipated widening on SR 202 and with installation of a signal, it is estimated that the AM and PM peak hour would both operate at LOS D. Analysis of signal warrants using the 1999 "with project" volumes indicate that Warrant #2 *Interruption of Continuous Traffic* is met. The warrant however, is not met without the addition of project generated traffic.

For the intersection of NE 37th Way/Sahalee Way NE, the installation of a signal will improve the level of service to LOS B for both the AM and PM conditions. The signal warrant analysis for this intersection, indicates the requirements for Warrant #1 *Minimum Vehicular Volume* and Warrant #2 *Interruption of Continuous Traffic* will be met in the 1999 horizon year with or without the project. It should be noted that the plat of Timberline Ridge was required to install a signal at this intersection. This project is currently under design and should be in place by First Quarter 1996.

VI. Accidents

The three year accident history at the two analysis intersections, SR 202/192nd Avenue NE and NE 37th Way/Sahalee Way NE was provided by WSDOT and King County. Since the SR 202/192nd Avenue NE intersection was recently revised and improved to provide access to the new plat of Hidden Ridge, the three year accident history was not relevant and therefore not considered. Alternatively, an evaluation of the accident history on SR 202 from 192nd Avenue NE to Sahalee Way NE was made. The 3 year accident history at these locations is provided in Table 4.

**Table 4
Accident History**

Location	Year				Acc. Rate
	1990	1991	1992	1993 ¹	
SR 202 192nd Avenue NE to Sahalee Way	22	12	10	11	1.64 ²
NE 37th Way/Sahalee Way NE	0	1	1	2	0.36 ³

¹ Accident data available through August 31, 1993

² Accidents per million vehicle miles of travel

³ Accidents per million entering vehicles

As shown in Table 4, the section of SR 202 between 192nd Avenue NE and Sahalee Way NE has experienced 55 accidents during the period from January 1, 1990 to August 31, 1993. The accident rate for this section during the 3+ year time period is 1.64 accidents per million vehicle miles of travel. This rate is considerably less than the statewide average for similar sections of 2.3 accidents per million vehicle miles of travel. Of the 55 accidents, 49 percent (27) were rear end accidents, 18 percent (10) were entering at angle, 15 percent (8) were fixed object and 11 percent (6) were head on accidents.

The intersection of NE 37th Way/Sahalee Way NE had a total of 4 accidents during the same 3+ year period identified above. The accident rate at this intersection during this period was 0.36 accidents per million entering vehicles. This rate also is considerably less than the statewide average for similar intersections of 1.7 accidents per million entering vehicles. Of the 4 accidents, 75 percent (3) were right angle and 25 percent (1) was a fixed object.

VII. Planned and Programmed Improvements

King County and the Washington State Department of Transportation have proposed several road improvements for the surrounding area which will improve pedestrian, bicycle and vehicular traffic operations and safety. Such improvements include:

King County

CIP Projects - Projects scheduled within the next 6 years

- East Lake Sammamish Parkway - SE 56th Street to Vaughn Hill Road. Project includes widening to 5 lanes with bicycle and pedestrian facilities on both sides.
- East Lake Sammamish Parkway - Vaughn Hill Road to I-90. Project includes widening to 7 lanes with bicycle and pedestrian facilities on both sides.

Community Plan Projects - Projects scheduled after 2000

- Sahalee Way/228th Avenue SE from SR 202 to Inglewood Hill Road (ES-11): Intersection/Operation Improvements.
- Sahalee Ring Road from NE 37th Way to NE 19th Place (ES-19.1): Construct new road with curb, gutter and sidewalk; 1.3 miles.
- East Lake Sammamish Parkway from SR 202 to Redmond City Limits (ES-23): Widen to three lanes with bikeway on road shoulders.
- Sahalee Way at NE 37th Way (ES-26): Intersection/operational improvements, including signalization.
- SR 202 from East Lake Sammamish Parkway to Sahalee Way (ES-31): Widen to four/five lanes with curb, gutter, sidewalk and Transit/HOV preferential; 2 miles.

- SR 202 from Sahalee Way to 236th Avenue NE/Bear Creek (ES-32): Widen to four lanes with paved shoulders.
- 228th Ave NE at NE 25th Way (ES-39): Intersection/operational improvements, including signalization.
- 228th Ave NE (Sahalee Way) from NE 37th St to NE 8th St (ES-75.1): Widen to three lanes with curb, gutter, sidewalk and bikelanes; 2.5 miles.
- Sahalee Way fro NE 37th Way to SR 202 (ES-75.2): Widen to four lanes and pave shoulders; 0.80 mile.
- Sahalee Way at SR 202 (ES-75.6): Turn channelization
- North Plateau Access Study from SR 202 to Inglewood Hill Road (NE 8th St) (ES-81): Conduct feasibility/needs study to address area circulation needs.
- Timberline Ridge from NE 42nd St stub to East Lake Sammamish Parkway (NE 50th St) (ES-87): construct two lane arterial; 1.00 mile.
- East Lake Sammamish Parkway at SR 202 (ES-90): Construct ramp bypass for Transit/HOV.

MPS Projects

The three proposed plats are located in an area designated as Zone 402 of the County's Mitigation Payment System program. The current CIP projects in Zone 402 are as follows:

- NE 124th Street
- Avondale Road
- Novelty Hill Road
- East Lake Sammamish Parkway
- 228th Avenue NE/SE
- Issaquah-Pine Lake Road
- Inglewood Hill Road (50 percent of zonal funds)

Based on the trip distribution patterns used for this analysis, the three plats will not have any impact on Inglewood Hill Road which requires 50 percent of the Zone 402 project funds, and uncertain impact on all other projects with the exception of 228th Ave NE/SE and East Lake Sammamish Parkway. Therefore, the three plats should not be required to participate in the full amount of the MPS fee.

City of Redmond Transportation Improvement Projects (1994-1999 TIP Numbers)

- #15 East Lake Sammamish Parkway/NE 65th Intersection Improvements to include signalization. Project scheduled for 1994. Funded.

#57 East Lake Sammamish Parkway/Redmond Way/180th Avenue NE Intersection Improvements to include signal modifications and intersection realignment. Project scheduled for 1994. Unfunded.

#73 East Lake Sammamish Parkway - Redmond Way to South City Limits. Widen to 3 lanes. Project scheduled for 1997. Unfunded.

WSDOT Projects

- SR 520/SR 202 Interchange - Construction of this project was begun in August 1994 and is expected to be complete in August 1996.
- SR 202 from East Lake Sammamish Parkway to Sahalee Way: Widen to four/five lanes with widened curb lane for bicycle use. Project to be constructed in two phases. Phase 1 will include the section from East Lake Sammamish Parkway to 187th Avenue NE; Phase 2 includes the section from 187th Avenue NE to Sahalee Way NE. There is currently no funding for either phase. The project is expected to begin in 1997.

VIII. Conclusions and Recommendations

The conclusions of the Level Two Study are presented at the end of the report.

IMPACT ANALYSIS

The EIS scope requested specific information to address the following questions:

1. *Provide traffic volume projections northwest of the site, through Hidden Ridge, and east of the site through Timberline. Traffic projections must consider background, pipeline and diverted traffic from residential developments east and northwest of the proposed projects.*

Anticipated average daily traffic volumes at selected locations resulting from the proposed action were calculated from the traffic assignment process identified in **Section III** of the traffic study. The results of the analysis indicated that there will be 1,894 vehicles per day on 192nd Avenue NE immediately north and adjacent to the north property line of Old Mill Point, and 1,422 vehicle per day on NE 42nd Street immediately east of and adjacent to the east property line of Chrysalis Estates. These estimated volumes include background, pipeline, and diverted traffic. Since actual ADT counts were not collected at these locations, background traffic volumes were calculated using ITE trip generation rates and a count of existing dwelling units. A summary of these volumes is presented in Table 5.

**Table 5
ADT Impacts at Selected Locations (with connection)**

Ref ^a No	Intersection Location	DIVERSION		PIPELINE PROJECTS			PROPOSED PLATS			TOTAL
		Shannon Wood	Existing Timberline	Hidden Ridge	Timberline Ridge	Sterling Wood	Old Mill Point	Weber's Ridge	Chrysalis Estates	
2	192nd Ave NE/NE 45th Pl	0	1040	36	0	0	528	187	103	1894
4	201st Ave NE/NE 42nd St	0	1030	36	0	0	226	80	50	1422

^a Refer to Figure 8 for location of each intersection

2. *Compare traffic volumes for the proposal and Design Alternative at the following locations:*

1. 192nd Avenue NE/SR 202
2. 192nd Avenue NE @ NE 45th Place
3. Between Old Mill Point and Weber's Ridge
4. NE 42nd Street @ 201st Avenue NE
5. NE 42nd Street @ NE 39th Street
6. 204th Avenue NE @ NE 38th Place
7. NE 37th Way @ 204th Court NE
8. NE 37th Way/Sahalee Way

A summary of the average daily traffic volumes at these locations for the Proposal and Design Alternative is presented in Table 6. The ADT estimates include traffic generated by diversion, other pipeline projects, and the proposed plats. The plats associated with each of these elements are identified in Table 5. It should be noted that other arterial traffic is not included.

The locations are identified in Figure 8. Also identified in Figure 8 is the diversion line for existing Timberline traffic. Again, the forecasts were determined from the traffic assignment process discussed in **Section III** of the traffic study.

**Table 6
ADT Estimates at Selected Locations^a**

Ref ^b No	Location	Proposed Action	Design Alternative
1	192nd Ave NE/SR 202	7,342	7,680
2	192nd Ave NE/NE 45th Pl	1,894	1,021
3	196th Ave NE/NE 43rd St	1,592	267
4	201st Ave NE/NE 42nd St	1,422	353
5	203rd Ave NE/NE 39th St	622	1,283
6	204th Ave NE/NE 38th Pl	932	1,473
7	204th Ct NE/NE 37th Way	1,514	2,273
8	Sahalee Way/NE 37th Way	7,526	8,669

^a Includes diverted, pipeline and proposed plats
^b Refer to Figure 8 for location of each intersection

3. *Conduct a signal warrant analysis at the intersection of SR 202 and 192nd Avenue NE.*

As discussed in the traffic study, a signal warrant analysis was prepared for the SR 202/192nd Avenue NE intersection. Analysis of signal warrants using the 1999 "with project" volumes indicate that Warrant #2 *Interruption of Continuous Traffic* is met. The warrant however, is not met without the addition of project generated traffic. A summary of the warrant analysis is presented in the Appendix.

4. *Discuss the need for through access for the proposed plats as related to King County's 100-lot rule. Describe safety issues associated with the through access for the proposal and the provision of emergency services with no through access for Design Alternative.*

The 100-lot rule is based on King County Ordinance 10435. This ordinance states that ". . . no residential neighborhood collector street shall serve more than 100 lots or dwelling units unless said residential neighborhood collector street is connected in at least two locations with another public roadway that functions at a level consistent with Chapter 2.03" (King County Road Standards)". The proposed action provides a through connection from 192nd Avenue NE in Hidden Ridge to NE 42nd Street in Timberline Park which constitutes a connection in two locations thereby meeting the requirements of Ordinance 10435.

On the other hand, Design Alternative will not provide public access between the plat of Weber's Ridge and Chrysalis Estates. As such, access to the arterial network (SR 202) from Old Mill Point and Weber's Ridge will be limited to 192nd Avenue NE whereas arterial access (Sahalee Way NE) for Chrysalis Estates will be limited to NE 42nd Street.

As a result, 192nd Avenue NE, a neighborhood collector, will exceed of the 100-lot rule since it will provide the sole connection to 197 lots including Hidden Ridge (90 lots), Old Mill Point (79 lots), and Weber's Ridge (28 lots). Furthermore, NE 42nd Street, a neighborhood collector, will exceed the 100 lot rule since it will

provide sole access to 102 lots including Timberline Park (86 lots) and Chrysalis Estates (16 lots). Therefore, a second or through connection would be required.

Old Mill Point and Chrysalis Estates however, were vested in 1990 prior to the adoption of Ordinance 10435 in July 1992 and therefore are not subject to it. Weber's Ridge, on the other hand, was modified in May 1993 and therefore lost their prior vesting and became subject to Ordinance 10435. As a result, Weber's Ridge must provide a second connection or obtain a variance to Ordinance 10435. It is believed that King County routinely grants such variances. NE 37th Way, a neighborhood collector, however will not be in violation of the 100 lot rule since Timberline Ridge, which is currently in the process of completing the county requirements necessary to record a final plat, will construct a southerly access by the first part of 1996.

Even though Old Mill Point and Chrysalis Estates are not subject to the ordinance, SEPA allows consideration of existing ordinances in the evaluation of project impacts even though the project has prior vesting. As such, Old Mill Point and Chrysalis Estates, although not subject to the ordinance, will be evaluated against requirements of the ordinance because of SEPA. Under SEPA, the environmental impact of providing or not providing a through access will be evaluated.

From the traffic standpoint, there are five aspects which must be considered. First, the differential impact of traffic between the two alternatives at critical locations must be considered. Secondly, the impact of traffic volumes on the livability of the street. Thirdly, the impact of not having a through connection on emergency vehicle access must be determined. Fourthly, the need for a second access to address unexpected as well as routine road closures must be evaluated. Finally, impact on existing driveways and roadway conditions

Based on the Level Two traffic study, there is no significant difference in level of service between the Proposed Action and the Design Alternative. Both analysis intersections were calculated to operate at LOS F for the 1999 "with" and "without" project condition during the peak hours with the exception of the SR 202/192nd Avenue NE intersection which was calculated to operate at LOS E in the 1999 PM peak hour for the without project condition. Furthermore, as shown in Table 6, the average daily traffic volumes at the selected locations are actually higher at the majority of the intersections under Design Alternative (no connection). As such, intersection level of service is not considered to be a significant factor in the overall evaluation of the Proposal and Design Alternative.

Traffic volumes along residential street have been shown to have a significant impact on the livability of the street. A study conducted by the University of California, Berkeley entitled "Livable Streets" indicated residential streets could be stratified by traffic volumes in one of three categories as follows:

- Light Traffic: 2000 vehicles per day
 200 vehicles per peak hour
- Moderate Traffic: 8000 vehicles per day
 550 vehicles per peak hour
- Heavy Traffic: 16,000 vehicles per day
 1,900 vehicles per peak hour

According to these classifications, all of the residential streets within the Timberline/Hidden Ridge neighborhoods, even with the project, will have traffic volumes which can be categorized as "Light Traffic".

"Livable Streets" summarized a survey of San Francisco residents noting the following characteristics of Light Traffic streets:

1. streets were considered to be safe
2. neighborhood was considered a close knit community
3. life was in some ways idyllic
4. streets were predominantly by families with many children

Based on the foregoing, traffic volumes along the neighborhood access streets for either the Proposed Action or Design Alternative will not have a negative impact on residential livability or safety.

Of particular importance however, is the provision of emergency vehicle access. If a through connection is not provided, emergency vehicle access will be significantly impacted. Emergency services include police, fire, and medical aid. In regards to police services, King County Police indicated the patrol cars are always on the street and they respond when a call is received so that the time to respond is dependent on the location of the patrol car when the call is received. The police precinct serving this area is Precinct #2 located at 18118 - 73rd Avenue NE, Bothell. On the other hand, fire services and medical response are dispatched from specific locations. The north end of the Sammamish Plateau is served by King County Fire District #34 which currently contracts with the City of Redmond to provide service. The stations serving this site include:

- Station 15 - 4200 228th Avenue NE
- Station 11 - 8450 161st Avenue NE
- Station 16 - 6500 185th Avenue NE (under construction)

Currently, primary response would be provided by Station 15 with back-up provided by Station 11. However, Station 16, currently under construction, and expected to be operational by Fall 1995, will replace Station 11 as the primary back-up station. In discussions with the Redmond Fire Department, they indicated the response time would be less than 5 minutes for both the fire and medical aid response with a through access. In addition to District 34, mutual aid response would be provided by District 10, Station 222 located at 1851 - 228th Avenue NE, Redmond. District 10 officials indicate their response time would be approximately 4 minutes with a through access.

The lack of a through connection will significantly alter response times of the primary and secondary response stations. To address this issue under Design Alternative (no connection), the applicant has proposed an emergency access route, which will connect NE 42nd Place in Weber's Ridge to 198th Place NE in Chrysalis Estates. Obviously, with the proposed action emergency access is provided.

Another consideration is the provision of a second access to address circulation needs in the event of an unexpected road closure which may occur with accidents, roadway repair, etc. The need for secondary access was substantiated several years ago when Sahalee Way NE was washed away. With the Proposed Action,

residents will have an alternative access whereas under Design Alternative a second connection would not exist. However, if the proposed emergency access were designed to appropriate standards e.g. minor access street, such a connection could be used on a temporary basis.

Finally, the location of driveways along existing access routes were approved consistent with the design standards applicable at the time of construction. Driveways along the access routes are typical of conditions e.g., steep grades, limited visibility throughout the Timberline neighborhoods. As such drivers, which are generally residents of the neighborhood, typically adjust their driving habits in anticipation of unexpected events.

In conclusion, from a traffic standpoint, there is not a significant difference between the Proposed Action and the Design Alternative.

5. *Describe the status of any road variances, including but not limited to, variances from standards for maximum grade, minimum stopping and entering sight distance, minimum radius for horizontal curves and maximum cul-de-sac length.*

The status report of road variances is to be provided by Ostergaard-Robinson & Associates.

6. *Discuss any additional adverse impacts identified by the consultant and/or the*

tion to the level of service impacts at the two analysis intersections, the t will increase traffic volumes in the Hidden Ridge and Timberline orhoods. Under the proposed action, which includes the 3 plats and the new tion, 27 AM and 37 PM project peak hour trips and 3 AM and 4 PM d trips from Hidden Ridge will pass through the Timberline neighborhoods. ion, 66 AM and 56 PM peak hour trips will be diverted from NE 37th Way d Avenue NE. This will increase traffic volumes along NE 42nd Street rly adjacent to the new plat of Chrysalis Estates.

ler the proposed action, 64 AM and 86 PM project peak hour trips will pass through Hidden Ridge along 192nd Avenue NE. In addition, diverted traffic from Timberline will add 66 AM and 56 PM peak hour trips to this route. This yields a net increase of 130 AM and 142 PM peak hour trips on 192nd Avenue NE. It should be noted that 192nd Avenue NE was designed to serve the additional volume.

Under Design Alternative, which includes the 3 plats without the connection from Weber's Ridge to Chrysalis Estates, it is estimated that 12 AM and 16 PM peak hour trips will be added to the Timberline neighborhood. This volume is simply traffic generated by the plat of Chrysalis Estates. On the other hand, it is estimated that 79 AM and 107 PM peak hour trips generated by the proposed plats of Old Mill Point and Weber's Ridge will pass through Hidden Ridge. Again, 192nd Avenue NE was designed to handle these volumes.

Residents in the existing plats have expressed concern about safety and the potential for increased criminal activity resulting from an overall increase in traffic volumes and non-residential traffic passing through the neighborhood.

Although traffic volumes will increase at certain locations on the residential street network under both alternatives, it should be noted that the majority of this traffic

will be traffic generated from the surrounding residential neighborhoods. Of sources, there will be the occasional service vehicle, school bus, sightseer, etc which will pass through the neighborhood, however, these conditions are assumed to exist for both the Proposed Action and Design Alternative.

It should be emphasized that even though the Proposed Action will provide a connection between SR 202 and Sahalee, the connection is designed in such a way to discourage traffic seeking a short cut. This will be accomplished through the design of circuitous routes, T-intersections and stop signs.

In regards to safety, it should always be considered dangerous for children to play in the street and as a matter of course, they should be discouraged from doing so. However, as noted in the "Livable Streets" report, (Livable Streets, University of California Press, 1981) residents considered streets with traffic volumes of 2000 vehicles per day to be "safe". At all critical locations evaluated in this study, with the exception of the 2 major intersections (192nd Avenue NE/SR 202 and Sahalee Way/NE 37th Way), the traffic volumes generated by the Proposed Action and Design Alternative will be within the approximate limits of the 2000 vehicle per day threshold. As such, the roadways would be considered "safe".

7. *The intersection of East Lake Sammamish Parkway and SR 202 is currently operating at LOS F and the intersection of 187th Avenue NE and SR 202 is projected to operate at LOS F in 1995. Provide trip distribution information between East Lake Sammamish Parkway and 192nd Avenue NE and quantify impacts on these two intersections.*

Based on the trip generation, trip distribution, and traffic assignment analyses discussed in the study, it was estimated that 59 AM peak hour trips, 81 PM peak hour trips and 765 daily project generated trips will impact each of these intersections.

MITIGATING MEASURES

1. *Discuss proposed mitigating measures for traffic, public access and road design issues.*

This report is limited to the discussion of mitigating measures for traffic as follows:

- a. Level of Service Mitigation

Level of service mitigation must be provided to address the level of service deficiencies at the intersections of NE 37th Way/Sahalee Way NE and SR 202/192nd Avenue NE. Based on the level of service analysis, traffic signals are required at each of these intersections in the 1999 time horizon. Timberline Ridge will construct a signal at NE 37th Way/Sahalee Way NE by the first quarter 1996. There are however, no plans for signalization of SR 202/192nd Avenue NE. With the signal, an acceptable level of service is achieved in 1999 for the with project condition even without the proposed WSDOT widening of SR 202. WSDOT has scheduled the SR 202 project for the 1997 biennium, however, no funding is currently available.

Proportionate shares of the SR 202/192nd Avenue NE signal for each of the plats is shown in Table 7.

**Table 7
Project Fair-Share Impacts**

Intersection	Minor Leg	1999 PM PK Minor Leg Volume	Old Mill Point	Weber's Ridge	Chrysalis Estates	Projects Total
SR 202/192nd Av NE	192nd Av NE	228	55 24.12%	20 8.77%	11 4.82%	86 37.71%

b. MPS Mitigation

The three proposed plats must participate in the King County Mitigation Payment System. Project participation in the MPS program should be limited to the extent the three plats impact the identified CIP projects.

2. *Discuss other mitigating measures identified by the consultant.*

No other mitigation measures were identified.

CONCLUSIONS AND RECOMMENDATIONS

The preceding analysis identified and evaluated critical transportation issues relating to the construction of the plats of Old Mill Point, Weber's Ridge, and Chrysalis Estates. The specific issues identified and addressed include:

- level of service at the critical intersections of NE 37th Way/Sahalee Way NE and SR 202/192nd Avenue NE
- connection of 192nd Avenue NE to NE 42nd Street
- necessary variances
- required mitigation

Level of Service

The two analysis intersections, SR 202/192nd Avenue NE and NE 37th Way/Sahalee Way NE will operate at LOS F with the project in 1999 without improvement. Level of service F is unacceptable whereas LOS D is acceptable according to King County Road Standards. To achieve an acceptable level of service, specific improvements were identified. These improvements include the following:

SR 202/192nd Avenue NE

Signalization

In addition, widening SR 202 to 5 lanes has been programmed by the WSDOT for 1997, although no funding is currently available. This project however is not required to achieve an acceptable level of service with the project in 1999.

NE 37th Way/Sahalee Way NE

Signalization

The plat of Timberline Ridge will construct a signal at this intersection by the first quarter of 1996. King County had programmed signalization of this intersection after 2000.

It is recommended that the LOS at these intersections be re-evaluated prior to construction to determine if these improvements are sufficient prior to full occupancy of these plats.

Connection of 192nd Avenue NE to NE 42nd Street

With the construction of the proposed plat(s), a new roadway connecting SR 202 to Sahalee Way NE via 192nd Avenue NE and NE 42nd Street will be provided. With this connection, it is estimated that a significant volume of traffic will divert from NE 37th Way to 192nd Avenue NE. Based on this analysis, it is estimated 66 existing AM peak hour trips and 56 existing PM peak hour trips generated from the existing Timberline neighborhoods will divert from NE 37th Way to 192nd Avenue NE. Conversely, with full development of Hidden Ridge and the new connection, 3 AM peak hour trips and 4 PM peak hour trips will divert from 192nd Avenue NE to NE 37th Way.

Overall, the proposed projects with the new connection, pipeline projects, and anticipated traffic diversion, will increase existing traffic on NE 37th Way by 171 AM and 259 PM peak hour trips or 2,450 daily trips whereas traffic on 192nd Avenue NE will increase by 166 AM and 191 PM peak hour trips or 1,820 daily trips.

If a new connection is not provided, traffic volumes on NE 37th Way will actually be higher whereas volumes on 192nd Avenue NE will be less. With the proposed projects, without the new connection, pipeline projects, and anticipated traffic diversion from the Timberline Ridge ring road connection, traffic will increase on NE 37th Way by 219 AM and 290 PM peak hour trips or 2,740 daily trips whereas traffic on 192nd Avenue NE will increase by 118 AM and 160 PM peak hour trips or 1,510 daily trips.

In addition to evaluating traffic volumes, consideration must be given to emergency vehicle access and alternative access routes in the event of road closures. King County has recognized these considerations through the 100-lot rule (Ordinance 10435). The rule however, because it was passed in 1992 is only applicable to Weber's Ridge. The remaining two plats were vested prior to adoption of the rule. If the conclusion of the EIS process indicates a connecting road through the three plats is undesired, the applicant has provided an emergency access connecting NE 42nd Place in Weber's Ridge to 198th Place NE in Chrysalis Estates. 198th Place NE connects to NE 42nd Court which then connects to NE 42nd Street in Timberline. This route will provide for emergency access, and in the event of unexpected road closures, could also provide a secondary access. As an emergency access, this roadway will be gated in a manner that only emergency vehicles will have access to it.

In conclusion, the need for a connection between 192nd Avenue NE and NE 42nd Street has been discussed in three previous Environmental Impact Statements including Timberline Ridge, Hidden Ridge and Lake Harbour. The conclusion of these reports is that the new connection will improve local neighborhood circulation and provide alternative ways for traffic to enter and exit the northerly Timberline area of the Sammamish Plateau. Furthermore, the new connection will provide an alternative

route to NE 37th Way for the Timberline neighborhoods to enhance emergency vehicle access and of provide a secondary route in the event of a road closure.

Necessary Variances

Necessary variances are discussed in the road design report.

Required Mitigation

It is recommended that the three plats participate in the following traffic mitigation:

Signalization of SR 202/192nd Avenue NE

Signalization is required at this intersection in 1999 with the project. Based on entering traffic volumes, the proposed plats should participate in the cost of the signal in relation to the project impact as follows:

<u>Project</u>		<u>Impact</u>	<u>Normalized Impact</u>
Old Mill Point	=	24.12 %	(63.96 %)
Weber's Ridge	=	8.77 %	(23.26 %)
Chrysalis Estates	=	4.82 %	(12.78 %)
Total	=	37.71 %	(100.00 %)

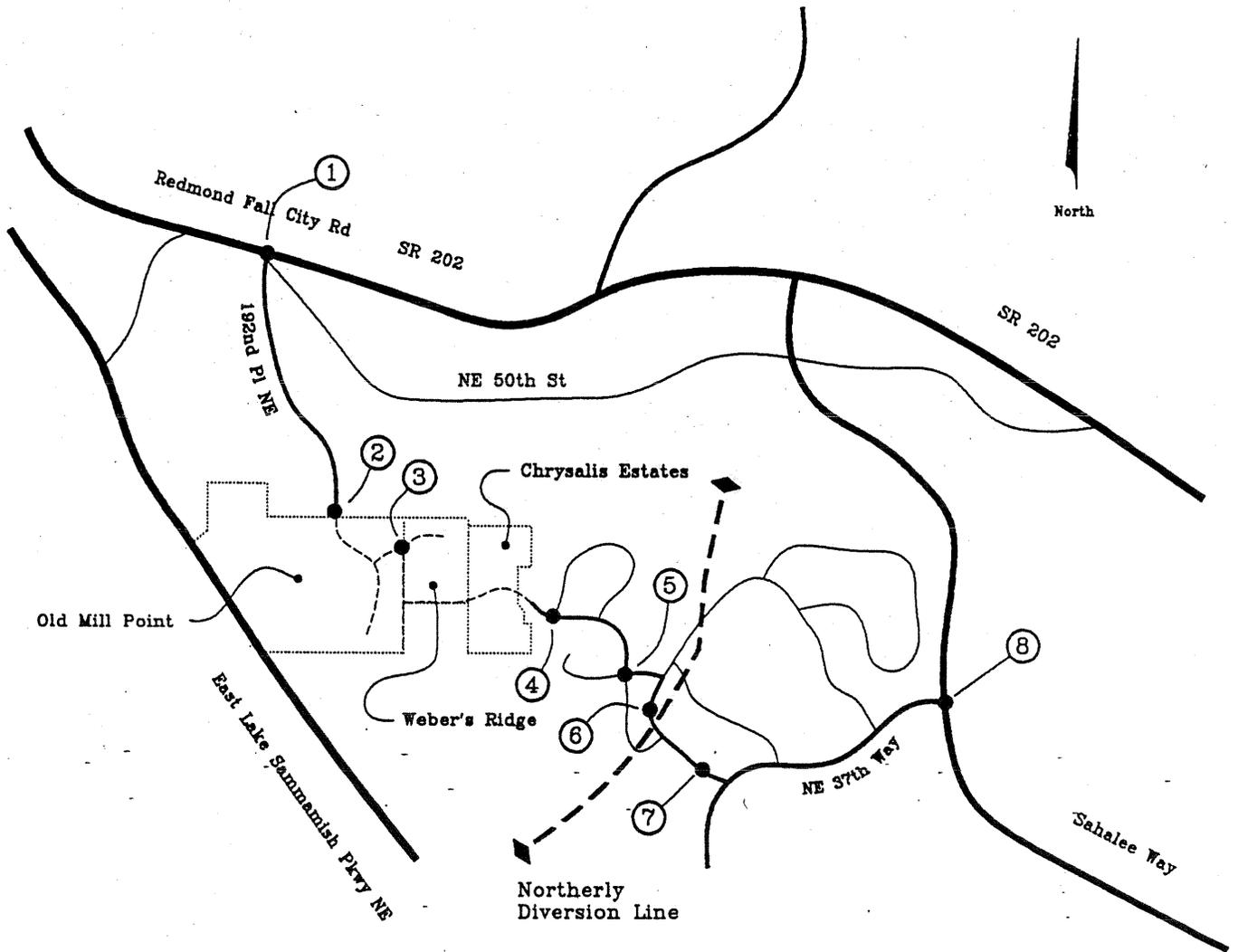
Since WSDOT has no plans for signalization at this intersection and no other pipeline projects are anticipated in the area, it is suggested that the three developments contribute all costs of the signal based on a normalized pro-rata share contribution as shown above.

Signalization of NE 37th Way/Sahalee Way NE

Signalization is required at this intersection in 1999 with the project. However, it is currently being designed for construction in the Fall of 1995. The Timberline Ridge development is providing all funds for a complete and operational signal.

King County Mitigation Payment System

The three plats shall participate in the King County Mitigation Payment System to the extent plat generated traffic impacts the CIP projects.



William Popp
Associates

ADT LOCATION MAP

Figure 8

Old Mill Point
Weber's Ridge
Chrysalis Estates

William Popp Associates

Transportation Engineers/Planners

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TECHNICAL APPENDIX
FOR
OLD MILL POINT
WEBER'S RIDGE &
CHRYSALIS ESTATES

September 20, 1994

LEVEL TWO TRAFFIC ANALYSIS OUTLINE

Categories

The requested traffic analysis shall be prepared in conformance with this outline.

I. Project Identification

1. Project Name or Identifying Reference
2. King County DDES File Number
3. Project Location
4. Developer Name, Representative and Phone No.
5. Development Description
 - a) Site Area
 - b) Building(s) Area, No. of stories
 - c) Number of Units (lots, apartments, etc.)
 - d) Parking stalls provided
6. Existing and Proposed Zoning
7. Expected construction date (opening) phasing.

II. Trip Generation

1. Source Table (ITE or source acceptable to Traffic and Planning Section of King County).
2. Correlate the parking stalls provided with Zoning, Proposed Use, Employment and trip generation for Industrial, Manufacturing and Warehouse Uses.
3. Cite the authority and applicability for new trip reduction (diverted or intercepted) for impact fee calculations.

III. Traffic Assignment

1. Describe method used to assign new trips to analysis roadways.
2. Separate AM, PM volumes and provide diagrams for distribution, new trips, total trips with project, and arterial ADT, with and without project.
3. Account for growth and pipeline development (projects with earlier completion dates).

IV. Site Services Inventory

1. Traffic controls, streets and lanes
2. Existing ROW and pavement width and lanes

3. Arterial Functional Classification
4. Transit Facilities
5. Site access legal documents construction standards.

V. LOS (Level of Service)

1. Existing and projected conditions LOS calculations
2. Projected includes growth rate and other identified development proposals
3. Specify CIP - Identified road projects in study area
4. Provide volume table or maps for study area
5. Provide worksheets

VI. Safety

1. Accident history (number, type, severity, rate)
2. Accident cause discussion for high accident locations
3. Sight distance for access

VII. Other Modes

1. Transit service description and impacts
2. Pedestrian, bike, equestrian: facilities and impacts

VIII. Parking

1. Demand
2. Available Supply

IX. Mitigation

1. Frontage improvements and right-of-way dedications
2. Possible improvement to restore system capacity
3. Access improvements
4. Safety - corrective measures
5. TSM actions
6. Demonstrate compliance with RAS Ordinance
7. Capacity restoration on alternative corridors

Study Area

Area includes access, RAS Intersection(s) and other major intersections serving site.

**YEAR 1999 ADT ESTIMATES
OLD MILL POINT/WEBER'S RIDGE/CHRYSALLIS ESTATES**

NO BUILD (WITHOUT PROJECTS WITHOUT CONNECTION)

ADT ESTIMATES		Old Mill	Weber's	Chysallis	Hidden	Existing	Timberline	Sterling-	Shannon-	
#	Location	Point	Ridge	Estates	Ridge	Timberline	Ridge	wood	Wood	TOTAL
1	192nd Ave NE/SR 202	0	0	0	900	3460	1660	320	220	6560
2	192nd Ave NE/NE 45th Pl	0	0	0	0	0	0	0	0	0
3	196th Ave NE/NE 43rd St	0	0	0	0	0	0	0	0	0
4	201st Ave NE/NE 42nd St	0	0	0	0	200	0	0	0	200
5	203rd Ave NE/NE 39th St	0	0	0	0	1130	0	0	0	1130
6	204th Ave NE/NE 38th Pl	0	0	0	0	1320	0	0	0	1320
7	204th Ct NE/NE 37th Way	0	0	0	0	2120	0	0	0	2120
8	Sahalee Way/NE 37th Way	0	0	0	270	5320	2020	380	220	8210

PROPOSED ACTION (WITH CONNECTION)

ADT ESTIMATES		Old Mill	Weber's	Chysallis	Hidden	Existing	Timberline	Sterling-	Shannon-	
#	Location	Point	Ridge	Estates	Ridge	Timberline	Ridge	wood	Wood	TOTAL
1	192nd Ave NE/SR 202	528	187	103	864	3460	1660	320	220	7342
2	192nd Ave NE/NE 45th Pl	528	187	103	36	1040	0	0	0	1894
3	196th Ave NE/NE 43rd St	226	187	103	36	1040	0	0	0	1592
4	201st Ave NE/NE 42nd St	226	80	50	36	1030	0	0	0	1422
5	203rd Ave NE/NE 39th St	226	80	50	36	230	0	0	0	622
6	204th Ave NE/NE 38th Pl	226	80	50	36	540	0	0	0	932
7	204th Ct NE/NE 37th Way	226	80	50	8	1150	0	0	0	1514
8	Sahalee Way/NE 37th Way	226	80	50	270	4280	2020	380	220	7526

ALTERNATIVE 1 (NO CONNECTION)

ADT ESTIMATES		Old Mill	Weber's	Chysallis	Hidden	Existing	Timberline	Sterling-	Shannon-	
#	Location	Point	Ridge	Estates	Ridge	Timberline	Ridge	wood	Wood	TOTAL
1	192nd Ave NE/SR 202	754	267	99	900	3460	1660	320	220	7680
2	192nd Ave NE/NE 45th Pl	754	267	0	0	0	0	0	0	1021
3	196th Ave NE/NE 43rd St	0	267	0	0	0	0	0	0	267
4	201st Ave NE/NE 42nd St	0	0	153	0	200	0	0	0	353
5	203rd Ave NE/NE 39th St	0	0	153	0	1130	0	0	0	1283
6	204th Ave NE/NE 38th Pl	0	0	153	0	1320	0	0	0	1473
7	204th Ct NE/NE 37th Way	0	0	153	0	2120	0	0	0	2273
8	Sahalee Way/NE 37th Way	226	80	153	270	5320	2020	380	220	8669

OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES

9/1/94 7:03 PM

Growth Factor (SR 202): 3.00%
 Growth Factor (Sahalee Way): 6.00%

NE 37th Way/Sahalee Way NE
 M PEAK

	1994 Existing	Bckgrd Grwth	Hidden Ridge	Hidden Ridge Constr.	Timberlin Ridge	Sterling-wood	Extg Shannon-wood	Extg Timberlin Diversion	Total Pipeline Impacts	1999 Bckgrd	Chrysalis Estates	Weber Ridge	Old Mill Point	1999 Total
BLT	90		3		13				16	106	3	5	16	130
BT	346	117	15						9	472				472
BRT	0								0	0				0
3LT	0								0	0				0
3T	592	200	8						2	794				794
3RT	144				116	24	21	-40	121	265				265
3LT	56				55	14	13	-16	66	122				122
3T	0								0	0				0
3RT	64		1		18				19	83	2	3	8	96
BLT	0								0	0				0
BT	0								0	0				0
BRT	0								0	0				0
	1292		27		202	38	22	-56	233	1842	5	8	24	1879
											0.27%	0.43%	1.28%	

1994 PM PK
 1999 PM PK w/o Old Mill Pt
 1999 PM PK w/ Old Mill Pt

E 95 EBLT
E -57 "
F -64 " B (w/SIGNAL)

NE 202nd Place NE
 M PEAK

	1994 Existing	Bckgrd Grwth	Hidden Ridge*	Hidden Ridge Constr.	Timberlin Ridge	Sterling-wood	Extg Shannon-wood	Extg Timberlin Diversion	Total Pipeline Impacts	1999 Bckgrd	Chrysalis Estates	Weber Ridge	Old Mill Point	1999 Total
LT	16		21	-16					21	37	3	7	18	65
T									16	0				0
RT	5		9	-5					4	9	0	0	1	10
LT									0	0				0
T									0	0				0
RT									0	0				0
LT									0	0				0
T	1264	201			114	21	15	-40	110	1575				1575
RT	22		38	-22					40	56	7	12	34	131
LT	6		18	-6					12	18	1	1	2	22
T	595	95			52	11	7	-16	54	744				744
RT									0	0				0
	1908		86	-49	166	32	22	0	257	2461	11	20	55	2547
											0.43%	0.79%	2.16%	

*Assumes 90 lots based on ITE (construction and extg traffic thus omitted)

1994 PM PK
 1999 PM PK w/o Old Mill Pt
 1999 PM PK w/ Old Mill Pt

E 41 NBLT
E 13 "
F -19 " A (w/SIGNAL)

OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES

9/1/94 7:03 PM

Growth Factor : 3.00%

Growth Factor (Sahalee Way) : 6.00%

37th Way/Sahalee Way NE
AM PEAK

	1994 Existing	Bckgrd Grwth	Hidden Ridge	Hidden Ridge Constr.	Timberlin Ridge	Sterling-wood	Extg Shannon-wood	Extg Timberlin Diversion	Total Pipeline Impacts	1999 Bckgrd	Chrysalis Estates	Weber Ridge	Old Mill Point	1999 Total
NBLT	31		1		9				10	41	1	2	4	48
NBT	682	231	4						0	913				913
NBRT	0								0	0				0
SBLT	0								0	0				0
SBT	210	71	13						9	290				290
SBRT	12				27	7	7	-3	38	50				50
EBLT	192				102	23	17	-63	79	271				271
EBT	0								0	0				0
EBRT	101		2		15				17	118	3	4	13	138
WBLT	0								0	0				0
WBT	0								0	0				0
WBRT	0								0	0				0
	1228		20		153	30	16	-66	153	1683	4			

0.23%

1994 AM PK

1999 AM PK w/o Old Mill Pt

1999 AM PK w/ Old Mill Pt

10 EBLT

-168 "

-170 "

B (w/s)

S² 202/NE 192nd Place NE
PEAK

	1994 Existing	Bckgrd Grwth	Hidden Ridge*	Hidden Ridge Constr.	Timberlin Ridge	Sterling-wood	Extg Shannon-wood	Extg Timberlin Diversion	Total Pipeline Impacts	1999 Bckgrd	Chrysalis Estates	Weber Ridge	Old Mill Point	1999 Total
NBLT	40		33	40					55	95	5	10	28	138
NBT									0	0				0
NBRT	2		15	-2					14	16	1	1	2	20
SBLT									0	0				0
SBT									0	0				0
SBRT									0	0				0
EBLT									0	0				0
EBT	262	42			26	5	3	-3	31	335				335
EBRT	35		11	-35					-21	14	2	4	10	30
WBLT	3		5	-3					2	5	0	0	1	6
WBT	1135	181			100	21	13	-62	72	1388				1388
WBRT									0	0				0
	1477		64		126	26	16	1	153	1853	8	15	41	1917

*Assumes 90 lots based on ITE (construction and extg traffic thus omitted)

0.42% 0.78% 2.14%

1994 AM PK

1999 AM PK w/o Old Mill Pt

1999 AM PK w/ Old Mill Pt

34 NBLT

-45 "

-92 "

A (w/SIGNAL)

**OLD MILL POINT
WEBER'S RIDGE
CHRYSALIS ESTATES**

**PRO-RATA SHARE CALCULATIONS
INTERSECTION IMPROVEMENTS**

9/29/94 10:11

Intersection	Minor Leg	Minor Leg Volume	Minor Leg Project Volume			Signal Improvements			All Projects Minor Leg %	
			Old Mill Point	Weber's Ridge	Chrysalis Estates	Old Mill Point	Weber's Ridge	Chrysalis Estates		
1999 AM PEAK HOUR										
NE 37th Way/Sahalee Way	NE 37th Way	507	17	6	4	27	3.35%	1.18%	0.79%	5.33%
SR 202/192nd PI NE	192nd PI NE	194	41	15	8	64	21.13%	7.73%	4.12%	32.99%
1999 PM PEAK HOUR										
NE 37th Way/Sahalee Way	NE 37th Way	613	24	8	5	37	3.92%	1.31%	0.82%	6.04%
SR 202/192nd PI NE	192nd PI NE	228	55	20	11	86	24.12%	8.77%	4.82%	37.72%

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 45
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 100000
 NAME OF THE EAST/WEST STREET..... NE 37th Way
 NAME OF THE NORTH/SOUTH STREET..... Sahalee Way
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/1/94
 TIME PERIOD ANALYZED..... 1994 AM PK
 OTHER INFORMATION.... EXISTING COUNT JAN '94

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	192	--	31	0
THRU	0	--	682	210
RIGHT	101	--	0	12

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	--	1	1

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	--	--	--	--
NORTHBOUND	-4.00	90	20	N
SOUTHBOUND	4.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	1	0
WESTBOUND	--	--	--
NORTHBOUND	0	1	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	6.10	5.60	0.00	5.60
MAJOR LEFTS				
NB	5.30	4.80	0.00	4.80
MINOR LEFTS				
EB	7.40	6.90	0.00	6.90

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
EB LEFT	211	225	221	221	10	E
RIGHT	111	855	855	855	744	A
MAJOR STREET						
NB LEFT	28	978	978	978	950	A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 45
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... NE 37th Way
 NAME OF THE NORTH/SOUTH STREET..... Sahalee Way
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/1/94
 TIME PERIOD ANALYZED..... 1994 PM PK
 OTHER INFORMATION..... EXISTING PM PEAK COUNT JAN '94

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	56	--	90	0
THRU	0	--	346	592
RIGHT	64	--	0	144

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	--	1	1

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	--	--	--	-
NORTHBOUND	-4.00	90	20	N
SOUTHBOUND	4.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	1	0
WESTBOUND	--	--	--
NORTHBOUND	0	1	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	6.10	5.60	0.00	5.60
MAJOR LEFTS				
NB	5.30	4.80	0.00	4.80
MINOR LEFTS				
EB	7.40	6.90	0.00	6.90

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
EB LEFT	62	172	156	156	95	E
RIGHT	70	499	499	499	429	A
MAJOR STREET						
NB LEFT	81	577	577	577	496	A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... SR 202
 NAME OF THE NORTH/SOUTH STREET..... 192nd Pl NE
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/1/94
 TIME PERIOD ANALYZED..... 1994 AM PK
 OTHER INFORMATION..... EXISTING AM COUNT JAN '94

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: EAST/WEST
 CONTROL TYPE NORTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	3	40	--
THRU	262	1135	0	--
RIGHT	35	0	2	--

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	1	2	--

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-3.00	90	20	N
WESTBOUND	3.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	----	----	----	-

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	2	0
WESTBOUND	0	1	0
NORTHBOUND	0	4	0
SOUTHBOUND	---	---	---

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
NB	6.50	6.00	0.00	6.00
MAJOR LEFTS				
WB	5.50	5.00	0.00	5.00
MINOR LEFTS				
NB	8.00	7.50	0.00	7.50

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
NB LEFT	44	78	78	78	34	E
RIGHT	2	727	727	727	725	A
MAJOR STREET						
WB LEFT	5	893	893	893	888	A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 100000
 NAME OF THE EAST/WEST STREET..... SR 202
 NAME OF THE NORTH/SOUTH STREET..... 192nd PL NE
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/1/94
 TIME PERIOD ANALYZED..... 1994 PM PK
 OTHER INFORMATION.... EXISTING PM PEAK COUNT JAN '94

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: EAST/WEST
 CONTROL TYPE NORTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	6	16	--
THRU	1264	595	0	--
RIGHT	22	0	5	--

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	1	2	--

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-3.00	90	20	N
WESTBOUND	3.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	---	---	---	---

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	---	---	---

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
NB	6.50	6.00	0.00	6.00
MAJOR LEFTS				
WB	5.50	5.00	0.00	5.00
MINOR LEFTS				
NB	8.00	7.50	0.00	7.50

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph)	ACTUAL MOVEMENT CAPACITY c (pcph)	SHARED CAPACITY c (pcph)	RESERVE CAPACITY c = c - v	LOS
		P	M	SH	R SH	
MINOR STREET						
NB LEFT	18	60	59	59	41	E
RIGHT	6	186	186	186	181	D
MAJOR STREET						
WB LEFT	9	280	280	280	271	C

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 45
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... NE 37th Way
 NAME OF THE NORTH/SOUTH STREET..... Sahalee Way
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 am pk
 OTHER INFORMATION.... w/o projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	271	--	41	0
THRU	0	--	913	290
RIGHT	118	--	0	50

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	--	1	1

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	---	---	---	-
NORTHBOUND	-4.00	90	20	N
SOUTHBOUND	4.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	1	0
WESTBOUND	---	---	---
NORTHBOUND	0	1	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	6.10	5.60	0.00	5.60
MAJOR LEFTS				
NB	5.30	4.80	0.00	4.80
MINOR LEFTS				
EB	7.40	6.90	0.00	6.90

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
EB LEFT	298	133	130	130	-168	F
RIGHT	130	761	761	761	631	A
MAJOR STREET						
NB LEFT	37	894	894	894	857	A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 45
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... NE 37th Way
 NAME OF THE NORTH/SOUTH STREET..... Sahalee Way
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 pm pk
 OTHER INFORMATION.... w/o projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	122	--	106	0
THRU	0	--	472	794
RIGHT	83	--	0	265

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	--	1	1

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	--	--	--	N
NORTHBOUND	-4.00	90	20	N
SOUTHBOUND	4.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	1	0
WESTBOUND	--	--	--
NORTHBOUND	0	1	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	6.10	5.60	0.00	5.60
MAJOR LEFTS				
NB	5.30	4.80	0.00	4.80
MINOR LEFTS				
EB	7.40	6.90	0.00	6.90

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
EB LEFT	134	93	77	77	-57	F
RIGHT	91	353	353	353	262	C
MAJOR STREET						
NB LEFT	95	401	401	401	306	B

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... SR 202
 NAME OF THE NORTH/SOUTH STREET..... 192nd Pl NE
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 am pk
 OTHER INFORMATION.... w/o projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: EAST/WEST
 CONTROL TYPE NORTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	5	95	--
THRU	335	1388	0	--
RIGHT	14	0	16	--

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	1	2	--

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-3.00	90	20	N
WESTBOUND	3.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	---	---	---	-

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	2	0
WESTBOUND	0	1	0
NORTHBOUND	0	4	0
SOUTHBOUND	---	---	---

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
NB	6.50	6.00	0.00	6.00
MAJOR LEFTS				
WB	5.50	5.00	0.00	5.00
MINOR LEFTS				
NB	8.00	7.50	0.00	7.50

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph)	ACTUAL MOVEMENT CAPACITY c (pcph)	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
NB LEFT	105	60	60	60	-45	F
RIGHT	18	672	672	672	655	A
MAJOR STREET						
WB LEFT	8	843	843	843	836	A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... SR 202
 NAME OF THE NORTH/SOUTH STREET..... 192nd Pl NE
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 pm pk
 OTHER INFORMATION..... w/o projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: EAST/WEST
 CONTROL TYPE NORTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	18	37	--
THRU	1575	744	0	--
RIGHT	78	0	9	--

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	1	2	--

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-3.00	90	20	N
WESTBOUND	3.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	---	---	---	-

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	---	---	---

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
NB	6.50	6.00	0.00	6.00
MAJOR LEFTS				
WB	5.50	5.00	0.00	5.00
MINOR LEFTS				
NB	8.00	7.50	0.00	7.50

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY	ACTUAL MOVEMENT CAPACITY	SHARED CAPACITY	RESERVE CAPACITY		LOS
		c (pcph) P	c (pcph) M	c (pcph) SH	c = c - v R	SH	
MINOR STREET							
NB LEFT	41	60	54	54	13		E
RIGHT	10	115	115	115	105		D
MAJOR STREET							
WB LEFT	28	185	185	185	157		D

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET... 45
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... NE 37th Way
 NAME OF THE NORTH/SOUTH STREET..... Sahalee Way
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 am pk
 OTHER INFORMATION.... w/projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	271	--	48	0
THRU	0	--	913	290
RIGHT	138	--	0	50

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	--	1	1

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	----	---	---	-
NORTHBOUND	-4.00	90	20	N
SOUTHBOUND	4.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	1	0
WESTBOUND	---	---	---
NORTHBOUND	0	1	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	6.10	5.60	0.00	5.60
MAJOR LEFTS				
NB	5.30	4.80	0.00	4.80
MINOR LEFTS				
EB	7.40	6.90	0.00	6.90

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
EB LEFT	298	132	128	128	-170	F
RIGHT	152	761	761	761	609	A
MAJOR STREET						
NB LEFT	43	894	894	894	851	A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 45
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 100000
 NAME OF THE EAST/WEST STREET..... NE 37th Way
 NAME OF THE NORTH/SOUTH STREET..... Sahalee Way
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 pm pk
 OTHER INFORMATION.... w/projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: NORTH/SOUTH
 CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	122	--	130	0
THRU	0	--	472	794
RIGHT	96	--	0	265

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	--	1	1

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	----	---	---	-
NORTHBOUND	-4.00	90	20	N
SOUTHBOUND	4.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	1	0
WESTBOUND	---	---	---
NORTHBOUND	0	1	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	6.10	5.60	0.00	5.60
MAJOR LEFTS				
NB	5.30	4.80	0.00	4.80
MINOR LEFTS				
EB	7.40	6.90	0.00	6.90

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
EB LEFT	134	90	70	70	-64	F
RIGHT	106	353	353	353	247	C
MAJOR STREET						
NB LEFT	117	401	401	401	284	C

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... SR 202
 NAME OF THE NORTH/SOUTH STREET..... 192nd Pl NE
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 am pk
 OTHER INFORMATION.... w/projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: EAST/WEST
 CONTROL TYPE NORTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	6	138	--
THRU	335	1388	0	--
RIGHT	30	0	20	--

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	1	2	--

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-3.00	90	20	N
WESTBOUND	3.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	---	---	---	-

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	2	0
WESTBOUND	0	1	0
NORTHBOUND	0	4	0
SOUTHBOUND	---	---	---

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
MAJOR LEFTS	NB 6.50	6.00	0.00	6.00
MINOR LEFTS	WB 5.50	5.00	0.00	5.00
	NB 8.00	7.50	0.00	7.50

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
NB LEFT	152	60	60	60	-92	F
RIGHT	22	665	665	665	643	A
MAJOR STREET						
WB LEFT	9	828	828	828	819	A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55
 PEAK HOUR FACTOR..... 1
 AREA POPULATION..... 1000000
 NAME OF THE EAST/WEST STREET..... SR 202
 NAME OF THE NORTH/SOUTH STREET..... 192nd Pl NE
 NAME OF THE ANALYST..... BPJ
 DATE OF THE ANALYSIS (mm/dd/yy)..... 9/2/94
 TIME PERIOD ANALYZED..... 1999 pm pk
 OTHER INFORMATION.... w/projects

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION
 MAJOR STREET DIRECTION: EAST/WEST
 CONTROL TYPE NORTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	22	65	--
THRU	1575	744	0	--
RIGHT	131	0	10	--

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	1	2	--

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-3.00	90	20	N
WESTBOUND	3.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	---	---	---	-

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	---	---	---

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
MAJOR LEFTS	NB 6.50	6.00	0.00	6.00
MINOR LEFTS	WB 5.50	5.00	0.00	5.00
	NB 8.00	7.50	0.00	7.50

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c _R - v SH	LOS
MINOR STREET						
NB LEFT	72	60	52	52	-19	F
RIGHT	11	115	115	115	104	D
MAJOR STREET						
WB LEFT	34	185	185	185	151	D

**OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES
1999 SIGNAL MITIGATION LEVELS OF SERVICE**

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..NE 37TH WAY/SAHALEE WAY
AREA TYPE.....OTHER
ANALYST.....BPJ
DATE.....9/2/94
TIME.....1999 AM.PK
COMMENT.....w/projects, with signal

VOLUMES				GEOMETRY								
	EB	WB	NB	SB	:	EB	WB	NB	SB			
LT	271	0	48	0	:	L	12.0	12.0	L	12.0	T	12.0
TH	0	0	913	290	:	R	12.0	12.0	T	12.0	R	12.0
RT	138	0	0	50	:		12.0	12.0		12.0		12.0
RR	0	0	0	0	:		12.0	12.0		12.0		12.0
					:		12.0	12.0		12.0		12.0
					:		12.0	12.0		12.0		12.0

ADJUSTMENT FACTORS										
	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	0.00	N	0	0	0.90	50	N	19.8	3
WB	0.00	0.00	N	0	0	0.90	50	N	19.8	3
NB	-4.00	1.00	N	0	0	0.90	50	N	11.3	3
SB	4.00	1.00	N	0	0	0.90	50	N	11.3	3

SIGNAL SETTINGS								CYCLE LENGTH = 70.0			
	PH-1	PH-2	PH-3	PH-4		PH-1	PH-2	PH-3	PH-4		
EB	LT	X			NB	LT	X				
	TH					TH	X				
	RT	X				RT					
	PD	X				PD					
WB	LT				SB	LT					
	TH					TH	X				
	RT					RT	X				
	PD					PD	X				
GREEN	20.0	0.0	0.0	0.0	GREEN	50.0	0.0	0.0	0.0		
YELLOW	0.0	0.0	0.0	0.0	YELLOW	0.0	0.0	0.0	0.0		

LEVEL OF SERVICE							
	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.834	0.243	29.7	D	24.7	C
	R	0.425	0.243	14.9	B		
NB	L	0.075	0.671	3.0	A	8.1	B
	T	0.827	0.671	8.4	B		
SB	T	0.273	0.671	3.0	A	2.9	A
	R	0.057	0.671	2.5	A		

INTERSECTION: Delay = 11.1 (sec/veh) V/C = 0.829 LOS = B

**OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES
1999 SIGNAL MITIGATION LEVELS OF SERVICE**

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..NE 37TH WAY/SAHALEE WAY
AREA TYPE.....OTHER
ANALYST.....BPJ
DATE.....9/2/94
TIME.....1999 pm pk
COMMENT.....w/projects, with signal

VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB	WB	NB	T	SB		
LT	122	0	130	0	:	L	12.0	12.0	L	12.0	T	12.0
TH	0	0	472	794	:	R	12.0	12.0	T	12.0	R	12.0
RT	96	0	0	265	:		12.0	12.0		12.0		12.0
RR	0	0	0	0	:		12.0	12.0		12.0		12.0
					:		12.0	12.0		12.0		12.0
					:		12.0	12.0		12.0		12.0

ADJUSTMENT FACTORS										
	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	0.00	N	0	0	0.90	50	N	14.5	3
WB	0.00	0.00	N	0	0	0.90	50	N	14.5	3
NB	-4.00	1.00	N	0	0	0.90	50	N	8.5	3
SB	4.00	1.00	N	0	0	0.90	50	N	8.5	3

SIGNAL SETTINGS								CYCLE LENGTH = 65.0			
	PH-1	PH-2	PH-3	PH-4		PH-1	PH-2	PH-3	PH-4		
EB LT	X				NB LT	X					
TH					TH	X					
RT	X				RT						
PD	X				PD						
WB LT					SB LT						
TH					TH	X					
RT					RT	X					
PD					PD	X					
GREEN	15.0	0.0	0.0	0.0	GREEN	50.0	0.0	0.0	0.0		
YELLOW	0.0	0.0	0.0	0.0	YELLOW	0.0	0.0	0.0	0.0		

LEVEL OF SERVICE							
	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.494	0.185	19.2	C	17.6	C
	R	0.389	0.185	15.4	C		
NB	L	0.915	0.723	39.1	D	10.3	B
	T	0.397	0.723	2.4	A		
SB	T	0.695	0.723	4.2	A	3.7	A
	R	0.281	0.723	2.1	A		

INTERSECTION: Delay = 7.4 (sec/veh) V/C = 0.829 LOS = B

**OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES
1999 SIGNAL MITIGATION LEVELS OF SERVICE**

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..SR 202/192nd Place NE
AREA TYPE.....OTHER
ANALYST.....BPJ
DATE.....9/2/94
TIME.....1999 am pk
COMMENT.....w/project w/2 lanes on SR 202

	VOLUMES				:	GEOMETRY					
	EB	WB	NB	SB		EB	WB	NB	SB		
LT	0	6	138	0	:	12.0	L	12.0	L	12.0	12.0
TH	335	1388	0	0	:	12.0	T	12.0	R	12.0	12.0
RT	30	0	20	0	:	12.0		12.0		12.0	12.0
RR	0	0	0	0	:	12.0		12.0		12.0	12.0
					:	12.0		12.0		12.0	12.0
					:	12.0		12.0		12.0	12.0

	ADJUSTMENT FACTORS									
	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	-3.00	2.00	N	0	0	0.90	50	N	8.5	3
WB	3.00	2.00	N	0	0	0.90	50	N	8.5	3
NB	0.00	0.00	N	0	0	0.90	50	N	14.5	3
SB	0.00	0.00	N	0	0	0.90	50	N	14.5	3

SIGNAL SETTINGS										CYCLE LENGTH = 100.0			
		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4		
EB	LT					NB	LT	X					
	TH	X					TH						
	RT	X					RT	X					
	PD	X					PD						
WB	LT	X				SB	LT						
	TH	X					TH						
	RT						RT						
	PD						PD						
GREEN		85.0	0.0	0.0	0.0	GREEN		15.0	0.0	0.0	0.0		
YELLOW		0.0	0.0	0.0	0.0	YELLOW		0.0	0.0	0.0	0.0		

LEVEL OF SERVICE							
	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	T	0.251	0.820	1.3	A	1.3	A
	R	0.027	0.820	1.1	A		
WB	L	0.008	0.820	1.2	A	42.5	E
	T	1.071	0.820	42.7	E		
NB	L	0.859	0.120	54.6	E	50.9	E
	R	0.121	0.120	25.4	D		

INTERSECTION: Delay = 35.4 (sec/veh) V/C = 1.044 LOS = D

**OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES
1999 SIGNAL MITIGATION LEVELS OF SERVICE**

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..SR 202/192nd Place NE
AREA TYPE.....OTHER
ANALYST.....BPJ
DATE.....9/2/94
TIME.....1999 PM PK
COMMENT.....w/projects w/2 lanes on SR 202

VOLUMES				GEOMETRY							
	EB	WB	NB	SB	:	EB	WB	NB	SB		
LT	0	22	65	0	:	T	12.0	L	12.0	12.0	
TH	1575	744	0	0	:	R	12.0	T	12.0	12.0	
RT	131	0	10	0	:		12.0		12.0	12.0	
RR	0	0	0	0	:		12.0		12.0	12.0	
					:		12.0		12.0	12.0	
					:		12.0		12.0	12.0	
					:		12.0		12.0	12.0	

ADJUSTMENT FACTORS										
	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	-3.00	2.00	N	0	0	0.90	50	N	8.5	3
WB	3.00	2.00	N	0	0	0.90	50	N	8.5	3
NB	0.00	0.00	N	0	0	0.90	50	N	14.5	3
SB	0.00	0.00	N	0	0	0.90	50	N	14.5	3

SIGNAL SETTINGS								CYCLE LENGTH = 165.0			
		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT					NB	LT	X			
	TH	X					TH				
	RT	X					RT	X			
	PD	X					PD				
WB	LT	X				SB	LT				
	TH	X					TH				
	RT						RT				
	PD						PD				
GREEN		150.0	0.0	0.0	0.0	GREEN		15.0	0.0	0.0	0.0
YELLOW		0.0	0.0	0.0	0.0	YELLOW		0.0	0.0	0.0	0.0

LEVEL OF SERVICE								
	LANE	GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	T		1.086	0.891	57.8	E	53.4	E
	R		0.109	0.891	0.7	A		
WB	L		0.568	0.891	12.6	B	1.8	A
	T		0.529	0.891	1.4	A		
NB	L		0.668	0.073	66.3	F	63.6	F
	R		0.100	0.073	46.2	E		

INTERSECTION: Delay = 38.2 (sec/veh) V/C = 1.054 LOS = D

**OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES
1999 SIGNAL MITIGATION LEVELS OF SERVICE**

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..SR 202/192nd Place NE
AREA TYPE.....OTHER
ANALYST.....BPJ
DATE.....9/2/94
TIME.....1999 am pk
COMMENT.....w/projects with 4L SR 202

VOLUMES				GEOMETRY							
	EB	WB	NB	SB	:	EB	WB	NB	SB		
LT	0	6	138	0	:	T 12.0	L 12.0	L 12.0	SB 12.0		
TH	335	1388	0	0	:	T 12.0	T 12.0	R 12.0	12.0		
RT	30	0	20	0	:	R 12.0	T 12.0	12.0	12.0		
RR	0	0	0	0	:	12.0	12.0	12.0	12.0		
					:	12.0	12.0	12.0	12.0		
					:	12.0	12.0	12.0	12.0		

ADJUSTMENT FACTORS										
	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	-3.00	2.00	N	0	0	0.90	50	N	11.3	3
WB	3.00	2.00	N	0	0	0.90	50	N	11.3	3
NB	0.00	0.00	N	0	0	0.90	50	N	25.8	3
SB	0.00	0.00	N	0	0	0.90	50	N	25.8	3

SIGNAL SETTINGS								CYCLE LENGTH = 75.0			
		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT					NB	LT	X			
	TH	X					TH				
	RT	X					RT	X			
	PD	X					PD				
WB	LT	X				SB	LT				
	TH	X					TH				
	RT						RT				
	PD						PD				
GREEN		60.0	0.0	0.0	0.0	GREEN		15.0	0.0	0.0	0.0
YELLOW		0.0	0.0	0.0	0.0	YELLOW		0.0	0.0	0.0	0.0

LEVEL OF SERVICE								
	LANE	GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	T		0.142	0.760	1.8	A	1.8	A
	R		0.029	0.760	1.7	A		
WB	L		0.008	0.760	1.7	A	3.3	A
	T		0.607	0.760	3.3	A		
NB	L		0.644	0.160	26.5	D	25.7	D
	R		0.091	0.160	20.4	C		

INTERSECTION: Delay = 4.8 (sec/veh) V/C = 0.613 LOS = A

**OLD MILL POINT, WEBER'S RIDGE, CHRYSALIS ESTATES
1999 SIGNAL MITIGATION LEVELS OF SERVICE**

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..SR 202/192nd Place NE
AREA TYPE.....OTHER
ANALYST.....BPJ
DATE.....9/2/94
TIME.....1999 PM PK
COMMENT.....w/projects with 4L SR 202

	VOLUMES				:	GEOMETRY						
	EB	WB	NB	SB		EB	WB	NB	SB			
LT	0	22	65	0	:	T	12.0	L	12.0	L	12.0	12.0
TH	1575	744	0	0	:	T	12.0	T	12.0	R	12.0	12.0
RT	131	0	10	0	:	R	12.0	T	12.0		12.0	12.0
RR	0	0	0	0	:		12.0		12.0		12.0	12.0
					:		12.0		12.0		12.0	12.0
					:		12.0		12.0		12.0	12.0

ADJUSTMENT FACTORS										
	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	-3.00	2.00	N	0	0	0.90	50	N	8.5	3
WB	3.00	2.00	N	0	0	0.90	50	N	8.5	3
NB	0.00	0.00	N	0	0	0.90	50	N	20.5	3
SB	0.00	0.00	N	0	0	0.90	50	N	20.5	3

SIGNAL SETTINGS										
		PH-1	PH-2	PH-3	PH-4	CYCLE LENGTH = 75.0				
		PH-1	PH-2	PH-3	PH-4	PH-1	PH-2	PH-3	PH-4	
EB	LT									
	TH	X								
	RT	X								
	PD	X								
WB	LT	X								
	TH	X								
	RT									
	PD									
GREEN		60.0	0.0	0.0	0.0	GREEN	15.0	0.0	0.0	0.0
YELLOW		0.0	0.0	0.0	0.0	YELLOW	0.0	0.0	0.0	0.0

LEVEL OF SERVICE								
	LANE	GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	T		0.668	0.760	3.8	A	3.6	A
	R		0.128	0.760	1.8	A		
WB	L		0.259	0.760	2.4	A	2.2	A
	T		0.325	0.760	2.2	A		
NB	L		0.304	0.160	21.4	C	21.2	C
	R		0.045	0.160	20.3	C		

INTERSECTION: Delay = 3.7 (sec/veh) V/C = 0.605 LOS = A

SIGNAL WARRANT ANALYSIS

Analysis Intersection: SR 202/192nd PI NE
 Year 1999 with projects with connection

Major Street Direction: EB/WB (NB/SB or EB/WB)
 Major Street # of Lanes: 2 ln(s) (approach)

Average Speed: 55 mph
 Minor Street # of Lanes: 1 ln(s) (approach)

Approximate 8th Highest Hour

Major Street: The 8th highest hour for both approaches - use the 54% to approximate

$$\text{Warrant Volume} = 54\% * (1706 + 766) = 1335 \text{ vph (8th highest hour; yr 1999)}$$

Minor Street: Based on 5/10/93 AWT counts at Sahalee/37th the 8th highest hour for the higher approach leg is 47% of the peak hour (which is the 7:00 to 8:00 AM period)

$$\text{Warrant Volume} = 47\% * (158) = 74 \text{ vph (8th highest hour; yr 1999)}$$

I. Warrant #1: Minimum Vehicular Volume

	Major Street	Minor Street	Vehicles per hour on Major Street		Vehicles per hour on Minor Street	
				70%*		70%*
A	1	1	500	(350)	150	(105)
B	2+	1	600	(420)	150	(105)
C	2+	2+	600	(420)	200	(140)
D	1	2+	500	(350)	200	(140)

* A 70% threshold reduction is warranted if speeds exceed 40 mph on major street.

II. Warrant #2: Interruption of Continuous Traffic

	Major Street	Minor Street	Vehicles per hour on Major Street		Vehicles per hour on Minor Street	
				70%*		70%*
A	1	1	750	(525)	75	(53)
B	2+	1	900	(630)	75	(53)
C	2+	2+	900	(630)	100	(70)
D	1	2+	750	(525)	100	(70)

* A 70% threshold reduction is warranted if speeds exceed 40 mph on major street.

III. Warrant check

	Warrant #1 Volume	Demand Volume	Warrant Justified?	
Major Street	(420)	1,335	Yes	No
Minor Street	(105)	74	No	
	Warrant #2 Volume	Demand Volume	Warrant Justified?	
Major Street	(630)	1,335	Yes	YES
Minor Street	(53)	74	Yes	

William Popp Associates

SIGNAL WARRANT ANALYSIS

Analysis Intersection: NE 37th Way/Sahalee Way
 Year 1999 with projects with connection

Major Street Direction:

NB/SB

 (NB/SB or EB/WB)
 Major Street # of Lanes:

1 ln(s)

 (approach)

Average Speed:

45 mph

 Minor Street # of Lanes:

2 ln(s)

 (approach)

Approximate 8th Highest Hour

Major Street: Based on 5/10/93 AWT counts the 8th highest hour for both approaches (represented as bothways s/o 37th) is 74% of the peak hour (which is the 5:00 to 6:00 PM period)

Warrant Volume = $74\% * (602 + 1059) = 1229$ vph (8th highest hour; yr 1999)

Minor Street: Based on 5/10/93 AWT counts the 8th highest hour for the higher approach leg is 47% of the peak hour (which is the 7:00 to 8:00 AM period)

Warrant Volume = $47\% * (409) = 192$ vph (8th highest hour; yr 1999)

I. Warrant #1: Minimum Vehicular Volume

	Major Street	Minor Street	Vehicles per hour on Major Street		Vehicles per hour on Minor Street	
			70%*		70%*	
A	1	1	500	(350)	150	(105)
B	2+	1	600	(420)	150	(105)
C	2+	2+	600	(420)	200	(140)
D	1	2+	500	(350)	200	(140)

* A 70% threshold reduction is warranted if speeds exceed 40 mph on major street.

II. Warrant #2: Interruption of Continuous Traffic

	Major Street	Minor Street	Vehicles per hour on Major Street		Vehicles per hour on Minor Street	
			70%*		70%*	
A	1	1	750	(525)	75	(53)
B	2+	1	900	(630)	75	(53)
C	2+	2+	900	(630)	100	(70)
D	1	2+	750	(525)	100	(70)

* A 70% threshold reduction is warranted if speeds exceed 40 mph on major street.

III. Warrant check

	Warrant #1 Volume	Demand Volume	Warrant Justified?
Major Street	(350)	1,229	Yes
Minor Street	(140)	192	Yes
	Warrant #2 Volume	Demand Volume	Warrant Justified?
Major Street	(525)	1,229	Yes
Minor Street	(70)	192	Yes