

David I. Hamlin & Associates

traffic design

transportation planning

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February 23, 1998

Granville Southern Corporation
P.O. Box 2878
Kirkland, WA. 98083

ATTN: Mike Reid

**Subject: Pacific Place - Analysis of S. 288th Street/SR-99
Intersection Per City of Federal Way Request**

Dear Mike:

Per your request, we have analyzed the intersection of S. 288th Street/SR-99. The City of Federal Way had indicated in their comments on Pacific Place that this intersection should have been included in the traffic impact analysis submitted to King County (even though no inter-local agreement exists between the two agencies and therefore no analysis was required by the County).

A PM peak hour turning movement count has been acquired at the intersection for use in the analysis. Figures 2, 6, and 7 of the traffic impact analysis have been revised to include the intersection volumes and have been attached. The following table summarizes the results of our analysis of the intersection.

TABLE 1
LEVEL OF SERVICE ANALYSIS - PM PEAK HOUR
S. 288TH STREET/SR-99

<u>Condition</u>	<u>Level of Service (Delay)</u>
Existing	EB - E (44 sec.)
	WB - E (56 sec.)
	NB - C (22 sec.)
	SB - E (50 sec.)
	OVERALL - E (43 sec.)
2002 w/out Project	EB - F (62 sec.)
	WB - F (76 sec.)
	NB - C (24 sec.)
	SB - F (**)
	OVERALL - F (**)
2002 with Project	EB - F (101 sec.)
	WB - F (78 sec.)
	NB - C (24 sec.)
	SB - F (**)
	OVERALL - F (**)

** - Delay and LOS not meaningful when any v/c is greater than 1.2 or 1/PHF.

Where:

<u>LOS</u>	<u>Delay</u>
A	≤ 5 seconds
B	> 5 & ≤ 15 seconds
C	>15 & ≤ 25 seconds
D	>25 & ≤ 40 seconds
E	>40 & ≤ 60 seconds
F	>60 seconds

The results of the analysis indicate that three legs of the intersection are currently approaching a level of service "F" condition, although the overall intersection level of service is still "E". However, the additional trips associated with miscellaneous background traffic, along with the trips associated with Pacific Place, will result in a future intersection level of service "F" (with or without Pacific Place).

The City of Federal Way has indicated that their TIP includes a project to add both eastbound and westbound left-turn lanes at the S. 288th Street/SR-99 intersection. Should you or King County decide that a proportionate share contribution toward these improvements be appropriate, Pacific Place's share would be 0.71% (28 of 3962) of the total PM peak hour trips in the year 2002.

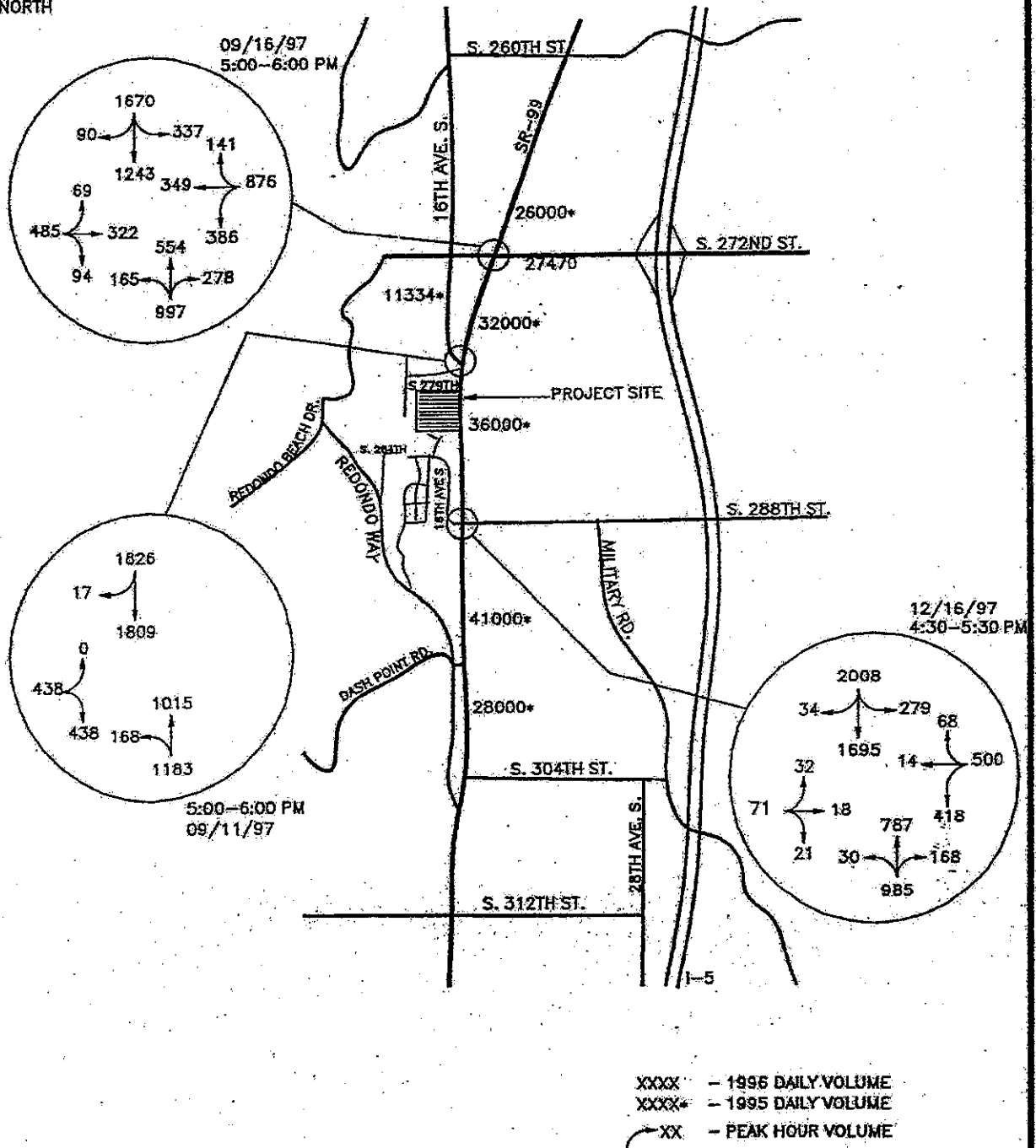
We trust that the above information adequately responds to your request. Please give me a call if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Geri Reinart".

Geri Reinart, P.E.
David I. Hamlin and Associates

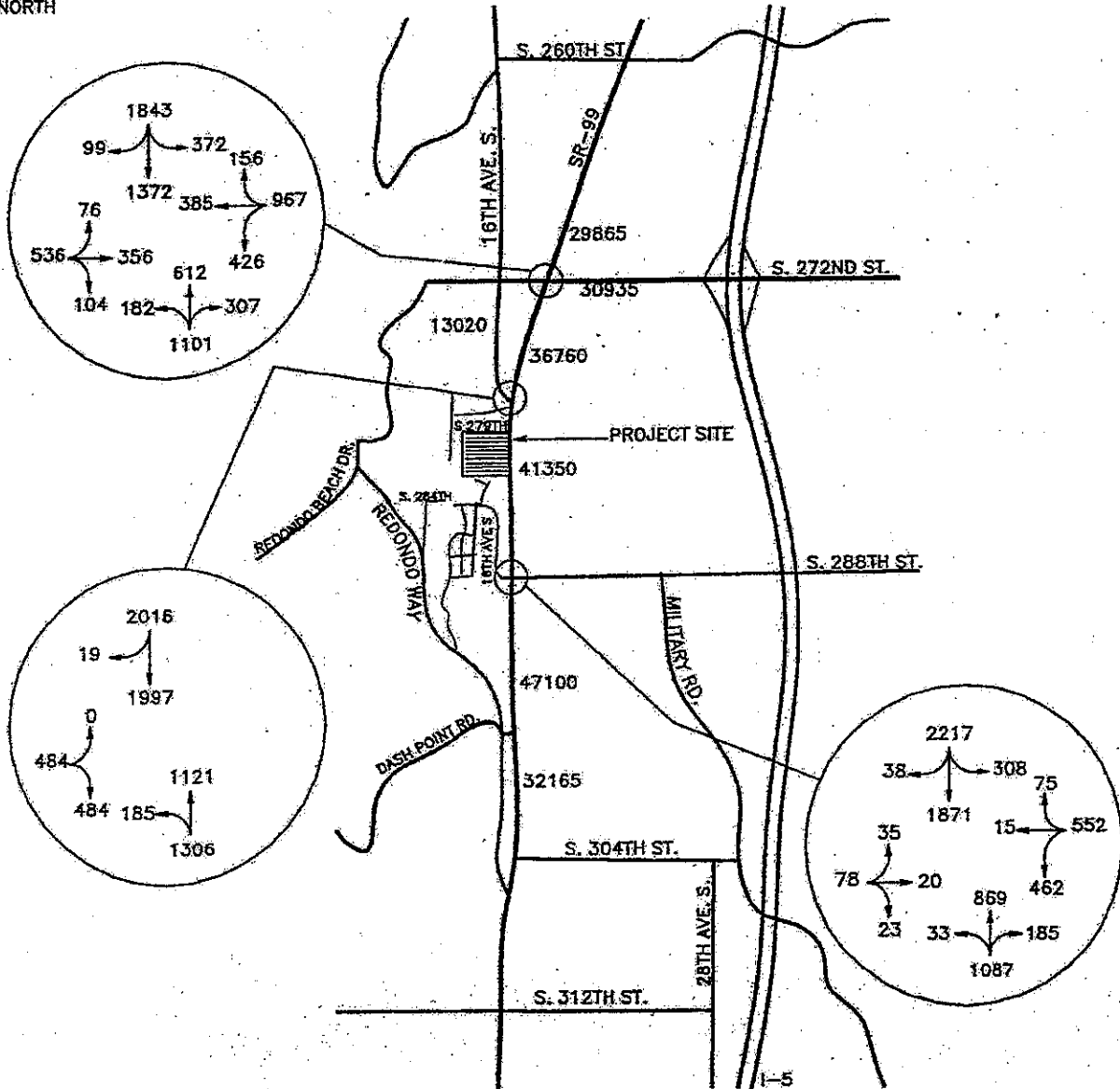
Attachments



EXISTING DAILY & PM PEAK HOUR VOLUMES

FIGURE 2

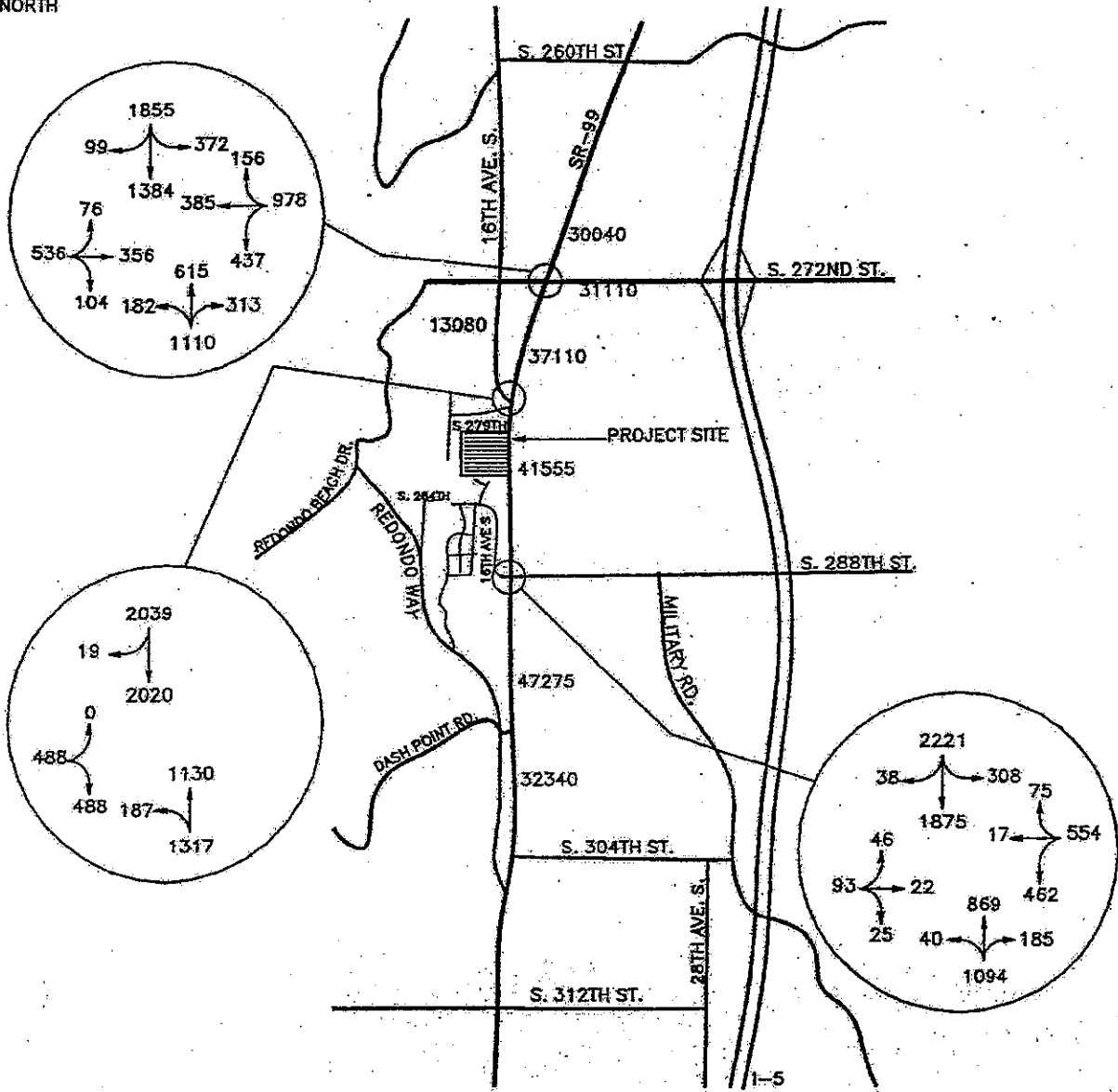
(REVISED 02/19/98)



XXXX - 2002 DAILY VOLUME
 → XX - PEAK HOUR VOLUME

2002 ESTIMATED DAILY & PM PEAK HOUR VOLUMES
 (WITHOUT PROJECT)
 FIGURE 6

(REVISED 02/19/98)



XXXX - 2002 DAILY VOLUME
 ~XX - PEAK HOUR VOLUME

2002 ESTIMATED DAILY & PM PEAK HOUR VOLUMES (WITH PROJECT)

FIGURE 7

(REVISED 02/19/98)

Center For Microcomputers In Transportation
 University of Florida
 512 Weil Hall
 Gainesville, FL 32611-2083 (904) 392-0378

Streets: (E-W) S. 288TH STREET (N-S) SR-99
 Analyst: GR File Name: X288SR99.HC9
 Area Type: Other 2-18-98 PM PEAK
 Comment: EXISTING PM PEAK HOUR

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	> 1	<		> 1	1		1	2	1	1	2	<
Volumes	32	18	21	418	14	68	30	787	168	279	1695	34
PHF or PK15	0.81	0.81	0.81	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Lane W (ft)	12.0			11.0 11.0			12.0	12.0	12.0	12.0	12.0	
Grade	3			0			0			0		
% Heavy Veh	3	3	3	2	2	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	Y	20.5 s	(Y/N)	Y	17.5 s	(Y/N)	Y	11.1 s	(Y/N)	Y	8.3
Arr Type		3			3	3	3	3	3	3	3	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left		*						
Thru		*						
Right		*						
Peds								
NB Right								
SB Right								
Green	9.0A	32.0A			4.0A	14.0A	41.0A	
Yellow/AR	4.0	4.0			4.0	4.0	4.0	

Cycle Length: 120 secs Phase combination order: #1 #2 #5 #6 #7

Streets: (E-W) S. 288TH STREET

(N-S) SR-99

Analyst: GR

File Name: X288SR99.HC9

Area Type: Other

2-18-98 PM PEAK

Comment: EXISTING PM PEAK HOUR

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
LTR	88	1528	0.058	0.083	127	0.691 *
WB						
LT	474	1717	0.276	0.275	472	1.004 *
R	75	1531	0.049	0.275	421	0.178
NB						
L	32	1770	0.018	0.042	74	0.434 *
T	888	3725	0.238	0.350	1304	0.681
R	181	1583	0.114	0.350	554	0.327
SB						
L	300	1770	0.169	0.192	339	0.884
TR	1953	3714	0.526	0.500	1857	1.052 *

Sum (v/s) critical = 0.878

Lost Time/Cycle, L = 12.0 sec Critical v/c(x) = 0.975

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
LTR	0.691	0.083	40.7	0.850	127	16	9.8	44.3	E	44.3	E
WB											
LT	1.004	0.275	33.1	0.850	472	16	32.8	60.9	F	55.5	E
R	0.178	0.275	25.2	0.850	421	16	0.0	21.4	C		
NB											
L	0.434	0.042	42.7	0.850	74	16	2.5	38.8	D	22.4	C
T	0.681	0.350	25.3	0.850	1304	16	1.0	22.5	C		
R	0.327	0.350	21.8	0.850	554	16	0.1	18.6	C		
SB											
L	0.884	0.192	35.9	0.850	339	16	16.1	46.6	E	49.5	E
TR	1.052	0.500	22.8	0.850	1857	16	30.6	50.0	E		

Intersection Delay = 42.8 sec/veh Intersection LOS = E

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Streets: (E-W) S. 288TH STREET

(N-S) SR-99

Analyst: GR

File Name: F288SR99.HC9

Area Type: Other

2-18-98 PM PEAK

Comment: ~~PM PEAK HOUR~~ w/out project

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	> 1	<		> 1	1		1	2	1	1	2	<
Volumes	35	20	23	462	15	75	33	869	185	308	1871	38
PHF or PK15	0.81	0.81	0.81	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Lane W (ft)	12.0			11.0 11.0			12.0 12.0 12.0			12.0 12.0		
Grade	3			0			0			0		
% Heavy Veh	3	3	3	2	2	2	2	2	2	2	2	2
Parking	(Y/N) N			(Y/N) N			(Y/N) N			(Y/N) N		
Bus Stops	0			0			0			0		
Con. Peds	0			0			0			0		
Ped Button	(Y/N) Y	20.5 s		(Y/N) Y	17.5 s		(Y/N) Y	11.1 s		(Y/N) Y	8.3	
Arr Type	3			3 3			3 3 3			3 3		
RTOR VoIs	0			0			0			0		
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left	*		
EB Thru	*				NB Thru		*	
EB Right	*				NB Right		*	
EB Peds					NB Peds			*
WB Left		*			SB Left	*	*	
WB Thru		*			SB Thru		*	*
WB Right		*			SB Right		*	*
WB Peds					SB Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	8.0A	33.0A			Green	3.0A	15.0A	41.0A
Yellow/AR	4.0	4.0			Yellow/AR	4.0	4.0	4.0

Cycle Length: 120 secs Phase combination order: #1 #2 #5 #6 #7

Streets: (E-W) S. 288TH STREET

(N-S) SR-99

Analyst: GR

File Name: F288SR99.HC9

Area Type: Other

2-18-98 PM PEAK

Comment: ~~EXISTING~~ PM PEAK HOUR *4 out project*

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/C)	Lane Group Capacity (c)	v/c Ratio
EB						
LTR	96	1529	0.063	0.075	115	0.837 *
WB						
LT	524	1717	0.305	0.283	486	1.077 *
R	82	1531	0.054	0.283	434	0.189
NB						
L	35	1770	0.020	0.033	59	0.593 *
T	981	3725	0.263	0.350	1304	0.752
R	199	1583	0.126	0.350	554	0.359
SB						
L	331	1770	0.187	0.192	339	0.976
TR	2156	3714	0.581	0.508	1888	1.142 *

Sum (v/s) critical = 0.968

Lost Time/Cycle, L = 12.0 sec Critical v/c(x) = 1.076

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
LTR	0.837	0.075	41.6	0.850	115	16	26.2	61.5	F	61.5	F
WB											
LT	1.077	0.283	32.7	0.850	486	16	56.3	84.1	F	75.6	F
R	0.189	0.283	24.7	0.850	434	16	0.0	21.1	C		
NB											
L	0.593	0.033	43.5	0.850	59	16	10.0	47.0	E	23.8	C
T	0.752	0.350	26.2	0.850	1304	16	1.8	24.0	C		
R	0.359	0.350	22.0	0.850	554	16	0.2	18.9	C		
SB											
L	0.976	0.192	36.6	0.850	339	16	31.5	62.7	F	*	*
TR	1.142	0.508	*	0.850	1888	16	*	*	*		

Intersection Delay = * (sec/veh) Intersection LOS = *

* Delay and LOS not meaningful when any v/c is greater than 1.2 or 1/PHF

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 Analyst: GR File Name: D288SR99.HC9
 Area Type: Other 2-18-98 PM PEAK
 Comment: ~~EXISTING~~ PM PEAK HOUR w/ project

Traffic and Roadway Conditions

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	> 1	<		> 1	1		1	2	1	1	2	<
Volumes	46	22	25	462	17	75	40	869	185	308	1875	38
PHF or PK15	0.81	0.81	0.81	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.93	0.93
Lane W (ft)	12.0			11.0 11.0			12.0 12.0 12.0			12.0 12.0		
Grade	3			0			0			0		
% Heavy Veh	3	3	3	2	2	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	Y	20.5 s	(Y/N)	Y	17.5 s	(Y/N)	Y	11.1 s	(Y/N)	Y	8.3
Arr Type		3			3	3	3	3	3	3	3	
RTOR Vols			0			0			0			0
Lost Time	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left		*						
Thru		*						
Right		*						
Peds								
NB Right								
SB Right								
EB Right								
WB Right								
Green	8.0A	33.0A			3.0A	15.0A	41.0A	
Yellow/AR	4.0	4.0			4.0	4.0	4.0	

Cycle Length: 120 secs Phase combination order: #1 #2 #5 #6 #7

Streets: (E-W) S. 288TH STREET

(N-S) SR-99

Analyst: GR

File Name: D288SR99.HC9

Area Type: Other

2-18-98 PM PEAK

Comment: ~~EXISTING~~ PM PEAK HOUR w/ project

Capacity Analysis Worksheet

Direction /LnGrp	Adj Flow Rate (v)	Adj Sat Flow Rate (s)	Flow Ratio (v/s)	Green Ratio (g/c)	Lane Group Capacity (c)	v/c Ratio
EB						
LTR	115	1531	0.075	0.075	115	1.002 *
WB						
LT	527	1718	0.307	0.283	487	1.083 *
R	82	1531	0.054	0.283	434	0.189
NB						
L	43	1770	0.024	0.033	59	0.729 *
T	981	3725	0.263	0.350	1304	0.752
R	199	1583	0.126	0.350	554	0.359
SB						
L	331	1770	0.187	0.192	339	0.976
TR	2160	3714	0.582	0.508	1888	1.144 *
Sum (v/s) critical = 0.988						
Lost Time/Cycle, L = 12.0 sec						Critical v/c(x) = 1.097

Level of Service Worksheet

Direction /LnGrp	v/c Ratio	g/C Ratio	Delay d 1	Del Adj Fact	Lane Group Cap	Calib d 2	Delay d 2	Lane Grp Del	Lane Grp LOS	Delay By App	LOS By App
EB											
LTR	1.002	0.075	42.2	0.850	115	16	65.1	100.9	F	100.9	F
WB											
LT	1.083	0.283	32.7	0.850	487	16	58.5	86.3	F	77.5	F
R	0.189	0.283	24.7	0.850	434	16	0.0	21.1	C		
NB											
L	0.729	0.033	43.7	0.850	59	16	22.9	60.1	F	24.4	C
T	0.752	0.350	26.2	0.850	1304	16	1.8	24.0	C		
R	0.359	0.350	22.0	0.850	554	16	0.2	18.9	C		
SB											
L	0.976	0.192	36.6	0.850	339	16	31.5	62.7	F	*	*
TR	1.144	0.508	*	0.850	1888	16	*	*	*		

Intersection Delay = * (sec/veh) Intersection LOS = *

* Delay and LOS not meaningful when any v/c is greater than 1.2 or 1/PHF