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May 4, 2007

Mr. Jay Patel  
Senior Engineer  
City of Agoura Hills  
3001 Ladyface Court  
Agoura Hills, CA 91301

**SUBJECT:** Stop Warrant Analysis for the Intersection of Reyes Adobe Road at Lake Lindero Drive

Dear Mr. Patel:

**REQUEST**

The City of Agoura Hills has requested Willdan to prepare a multi-way stop sign warrant analysis for the intersection of Reyes Adobe Road at Lake Lindero Drive.

**CONDITIONS**

Reyes Adobe Road is a north/south residential roadway that is 64-feet wide with two lanes of traffic in each direction south of the intersection and one lane of traffic in each direction north of the intersection, separated by a double yellow line. The posted speed limit on Reyes Adobe Road is 40 mph.

Lake Lindero Drive is an east/west residential roadway that is 40-feet wide with one lane of traffic in each direction with no centerline striping. Lake Lindero Drive is stopped controlled at its intersection with Reyes Adobe Road. The posted speed limit on Lake Lindero Drive is 25 mph.

**DATA**

Twenty-four hour approach counts (Exhibit B) were taken on Reyes Adobe Road at Lake Lindero Drive. Pedestrian counts were also collected during the peak hour periods of 7:00 to 9:00 AM and 1:30 to 3:30 PM.

A radar speed survey (Exhibit C) was conducted on Reyes Adobe Road at approximately 470' south of Lake Lindero Drive and the 85<sup>th</sup> percentile approach speed was determined to be 42 mph.

No accidents occurred at this location for the past 12 months.

## DISCUSSION

The installation of Stop signs is based on guidelines in the 2006 California Manual of Uniform Traffic Control Devices (California MUTCD). These guidelines, or warrants, are based on the most recent reported accident history, traffic volumes entering the intersection, delay and the number of pedestrians crossing the major street.

"Stop" control is intended to assign positive right-of-way at intersections. The control is usually established on the street with the least volume of traffic. Additional control, beyond the basic right-of-way assignment, is usually reserved for those locations where the volume of traffic exceeds 300 vehicles per hour for any eight hours of an average day and where both streets having about the same amount of traffic, lends credibility to the higher level of intersection control. Without credibility, voluntary compliance is poor and without voluntary compliance, traffic safety is severely compromised.

Exhibit A depicts the California MUTCD guidelines as applied to the intersection of Reyes Adobe Road at Lake Lindero Drive. The guidelines indicate the intersection of Reyes Adobe Road at Lake Lindero Drive does satisfy two of the warrants for the installation of Stop signs: 1) Need to control left turn conflicts; 2) Visibility obstruction after stopping on minor street approach. Field observations reinforce this determination when motorist driving westbound on Lake Lindero Drive have visibility obstructions of northbound traffic on Reyes Adobe Road due to a horizontal curve.

## RECOMMENDATION

The installation of stop signs on Reyes Adobe Road and Lake Lindero Drive is recommended at this time. California MUTCD guidelines indicate a multi-way stop condition is warranted due to visibility obstructions on northbound Reyes Adobe Road for motorist stopped at Lake Lindero Drive and to control left turn conflicts.

Should you have any questions regarding this study, please contact me at (562) 908-6225

Sincerely,

WILLDAN



Vanessa Munoz, P.E., T.E.  
Supervising Engineer

**EXHIBIT "A"**

## MULTI-WAY STOP SIGN WORKSHEET

MAJOR STREET: Reyes Adobe Road      85<sup>TH</sup> SPEED - 42 MPH

MINOR STREET: Lake Lindero Drive      DATE: May 4, 2007

**TRAFFIC VOLUMES** WARRANTED      YES  **NO**

If the 85<sup>th</sup> percentile speed of the major street exceeds 40 MPH, use 70% volume.

Street	Min Volume	70%	80%	Ave.	Hour / Volume							
					11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
Major	300	210	240	169	105	125	158	371	218	126	141	108
Minor	200	140	160	87	52	58	109	126	177	63	62	62

And, does the minor street have an average delay of at least 30 seconds in the peak hour?

Peak Average Delay	4.6 seconds
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**COLLISION RECORD** WARRANTED      YES  **NO**

Are there five or more reported collisions within a 12 month period of a type correctable by a multi-way stop sign?

DATE	TIME	DIRECTION	TYPE	CAUSE

**80% COMBINATION** WARRANTED      YES  **NO**

Are there four or more reported accidents within a 12 month period of a type correctable by a multi-way stop sign, and

Average major and minor street volumes are at least 80% of the minimum values?

**OTHER MULTI-WAY STOP CONDITIONS** WARRANTED      YES      NO

A. Need to control left turn conflicts	YES <input checked="" type="radio"/>	NO <input type="radio"/>
B. Need to control vehicle/pedestrian conflicts at high ped locations	YES <input type="radio"/>	NO <input checked="" type="radio"/>
C. Visibility obstruction after stopping on minor street approach	YES <input checked="" type="radio"/>	NO <input type="radio"/>
D. Two similar neighborhood collector streets that would improve operation	YES <input type="radio"/>	NO <input checked="" type="radio"/>

**EXHIBIT "B"**

Volumes for: Tuesday, May 01, 2007

City: Agoura Hills

Project #: 07-2201-001

Location: Reyes Adobe Rd @ Lake Lindero Dr

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB					
00:00	1	0	0	0	12:00	11	21	4	4					
00:15	0	0	1	0	12:15	14	12	7	8					
00:30	2	0	1	0	12:30	25	6	11	4					
00:45	0	3	0	0	12:45	26	76	10	49	12	34	8	24	183
01:00	0	0	1	0	13:00	13	28	8	13					
01:15	2	0	0	2	13:15	19	11	12	9					
01:30	0	0	1	0	13:30	30	5	13	9					
01:45	0	2	0	0	13:45	44	106	8	52	23	56	14	45	259
02:00	6	0	0	0	14:00	40	22	11	10					
02:15	0	0	0	0	14:15	42	51	24	9					
02:30	0	0	0	0	14:30	68	73	21	9					
02:45	0	6	0	0	14:45	26	176	49	195	17	73	13	41	485
03:00	0	0	0	0	15:00	40	8	23	14					
03:15	0	0	0	0	15:15	43	20	58	11					
03:30	0	0	0	0	15:30	34	28	21	19					
03:45	0	0	1	1	15:45	23	140	22	78	13	115	7	51	384
04:00	0	0	1	0	16:00	23	14	8	7					
04:15	1	0	0	1	16:15	27	16	11	4					
04:30	0	0	1	0	16:30	18	6	11	9					
04:45	0	1	0	0	16:45	13	81	3	39	6	36	7	27	183
05:00	2	0	1	2	17:00	30	11	8	8					
05:15	1	0	1	0	17:15	27	5	8	9					
05:30	2	1	1	3	17:30	23	9	6	6					
05:45	0	5	0	1	17:45	24	104	12	37	4	26	13	36	203
06:00	1	0	4	1	18:00	22	11	12	3					
06:15	5	0	0	7	18:15	26	6	8	3					
06:30	7	0	8	8	18:30	18	7	9	3					
06:45	15	28	2	2	18:45	17	83	1	25	9	38	15	24	170
07:00	8	1	3	12	19:00	20	4	9	12					
07:15	4	2	4	2	19:15	10	5	7	8					
07:30	13	0	6	6	19:30	23	4	9	3					
07:45	11	36	6	9	19:45	18	71	4	17	4	29	10	33	150
08:00	9	5	7	8	20:00	10	2	10	9					
08:15	6	7	6	6	20:15	7	5	7	8					
08:30	8	6	8	7	20:30	19	2	6	12					
08:45	10	33	5	23	20:45	14	50	1	10	6	29	6	35	124
09:00	15	3	8	8	21:00	5	0	1	0					
09:15	11	4	10	11	21:15	7	2	2	0					
09:30	6	4	13	8	21:30	13	0	1	1					
09:45	11	43	5	16	21:45	8	33	0	2	2	6	5	6	47
10:00	21	4	6	15	22:00	6	1	1	2					
10:15	14	2	5	8	22:15	11	1	0	4					
10:30	11	8	9	6	22:30	5	0	1	0					
10:45	10	56	0	14	22:45	3	25	0	2	1	3	3	9	39
11:00	11	7	5	6	23:00	6	0	1	2					
11:15	14	1	1	8	23:15	6	0	1	0					
11:30	24	7	12	7	23:30	4	0	1	0					
11:45	22	71	19	34	23:45	2	18	0	0	0	3	0	2	23

<b>Total Vol.</b>	284	100	176	190	<b>750</b>	963	506	448	333	<b>2250</b>
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Daily Totals				
NB	SB	EB	WB	Combined
1247	606	624	523	<b>3000</b>

Split %	AM					PM				
	37.9%	13.3%	23.5%	25.3%	25.0%	42.8%	22.5%	19.9%	14.8%	75.0%

Peak Hour	11:45	11:30	08:45	06:15	<b>11:30</b>	13:45	14:00	14:30	14:45	<b>14:30</b>
<b>Volume</b>	72	59	37	44	<b>185</b>	194	195	119	57	<b>493</b>
<b>P.H.F.</b>	0.72	0.70	0.71	0.65	<b>0.86</b>	0.95	0.67	0.51	0.75	<b>0.72</b>

**PREPARED BY NATIONAL DATA & SURVEYING SERVICES**

PROJECT#: 07-2202-001

LOCATION: Reyes Adobe Rd & Lake Lindero Dr

DATE: 05/2/07

DAY: Wednesday

CITY: Agura Hills

*PEDESTRIANS*

TIME	NORTH-LEG		SOUTH-LEG		EAST-LEG		WEST-LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	1	0	0	0
7:15 AM	1	1	2	0	0	2	0	0
7:30 AM	0	0	0	0	0	1	0	1
7:45 AM	0	0	2	0	0	1	4	0
8:00 AM	1	0	0	0	3	0	0	0
8:15 AM	0	0	0	0	1	0	1	0
8:30 AM	0	1	0	0	2	0	1	1
8:45 AM	3	0	0	0	0	0	0	0
TOTALS	5	2	4	0	7	4	6	2

*PEDESTRIANS*

TIME	NORTH-LEG		SOUTH-LEG		EAST-LEG		WEST-LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
1:30 PM	0	0	0	1	1	2	0	2
1:45 PM	1	1	0	0	0	2	1	0
2:00 PM	0	0	0	0	1	0	1	0
2:15 PM	1	0	0	2	0	0	1	1
2:30 PM	0	0	1	1	0	1	3	0
2:45 PM	1	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	1	0	0	0
3:15 PM	0	0	0	2	1	2	1	1
3:30 PM	1	0	0	0	0	0	1	1
TOTALS	4	1	1	6	4	7	8	5

**PREPARED BY NATIONAL DATA & SURVEYING SERVICES**

PROJECT#: 07-2202-001

LOCATION: Reyes Adobe Rd & Lake Lindero Dr

DATE: 05/2/07

CITY: Agura Hills

DAY: Wednesday

*BIKES*

TIME				
	NB	SB	EB	WB
7:00 AM	0	0	0	0
7:15 AM	0	0	0	1
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	1	2
8:15 AM	0	0	0	0
8:30 AM	1	0	1	0
8:45 AM	0	0	0	0
TOTALS	1	0	2	3

*BIKES*

TIME				
	EB	WB	EB	WB
1:30 PM	0	0	0	0
1:45 PM	0	0	0	0
2:00 PM	1	0	0	0
2:15 PM	0	0	2	0
2:30 PM	1	0	0	0
2:45 PM	1	1	1	1
3:00 PM	0	0	2	0
3:15 PM	0	0	1	0
3:30 PM	0	0	0	0
TOTALS	3	1	6	1



**EXHIBIT "C"**

