Level of Service (LOS)

Pedro Valera
Dr. Wen Cheng, Ph.D.
Dr. Felipe Perez, Ph.D.
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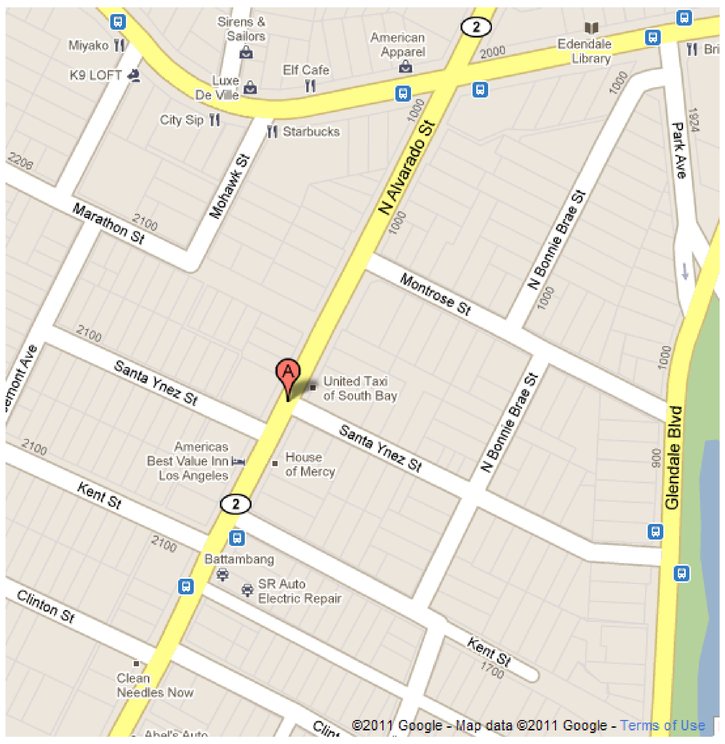
Background

This study analyzes the current traffic conditions associated with construction of Central Region Elementary School #14 for the Los Angeles Unified School District and compares a change in Level of Service with respect to change in volume counts. The site is located at the intersection of North Alvarado Street and Santa Ynez Street in Los Angeles, California.



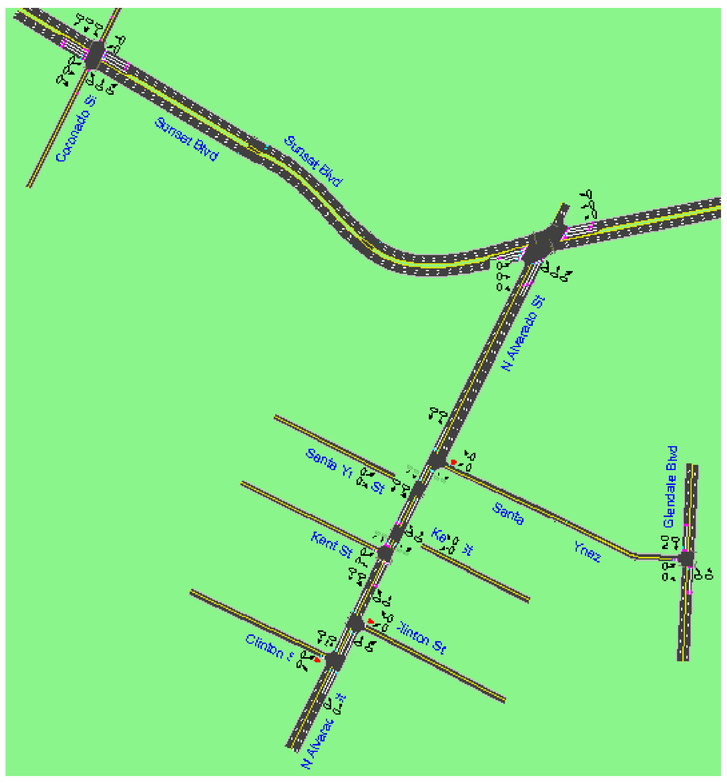
Level of service (LOS) is a grading system used to describe the traffic flow at an intersection. The Intersection Capacity Utilization (ICU) analysis method was used. This method includes LOS ranges from A to H and is based on the ratio of the volume exhibited in an intersection to its capacity. Table 3 gives a description of each LOS and its V/C ratio.

Table1. Level of Service. This table shows ICU LOS grades and their characteristics.

LOS	Description	V/C ratio
A	No congestion	≤ .55
B	Very little congestion	.55-.64
C	No major congestion	.65-.73
D	Normally has no congestion	.73-.82
E	On the verge of congested conditions	.82-.91
F	Over capacity, congestion periods of 15-60 min daily	.91-1.0
G	Congestion periods of 60-120 min daily	1.0-1.09
H	Congestion periods over 120min daily	≥1.09

Procedure

To determine the existing operations of the intersections listed, a.m. and p.m. peak hour intersection traffic volume counts were taken from the Los Angeles Department of Transportation (LADOT) online database. I created a model of the intersections around our site using Synchro 7 software. This software allows the user to input volumes and growth factors and provides LOS for the created situations.



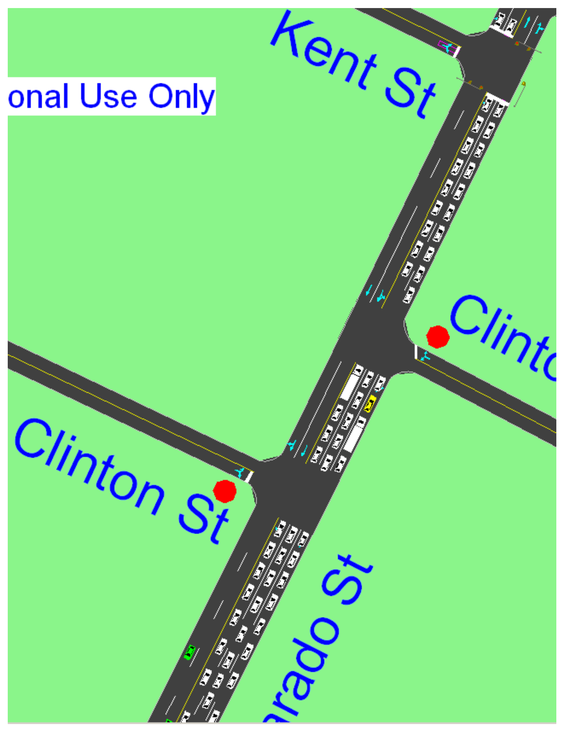
Conclusion

The unacceptable LOS grades were due to large turning volumes that would conflict with the through volumes. Stop signs back up right and left turning movements from minor streets by forcing them to wait for through traffic to pass.

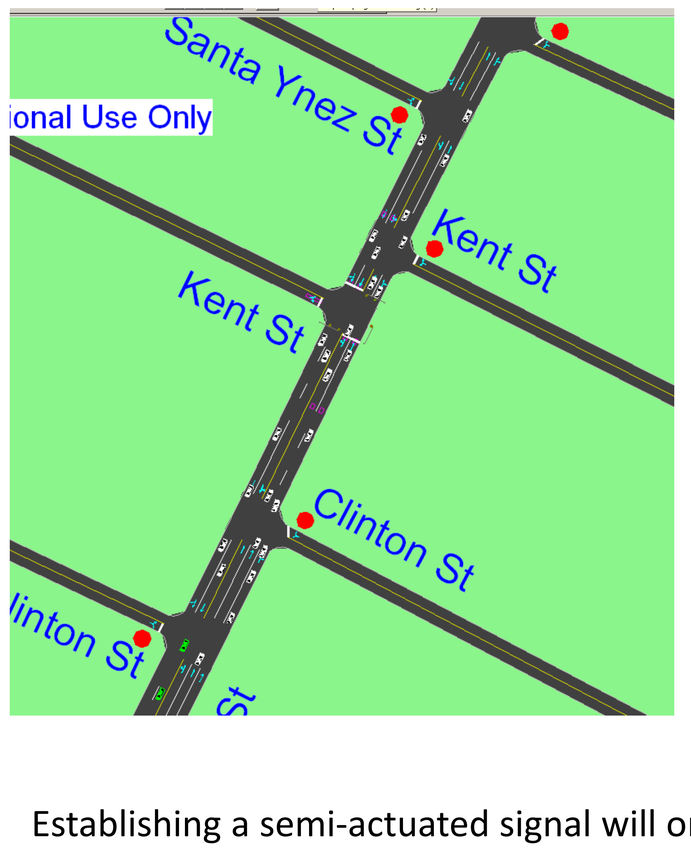
Results

The table below shows the LOS results for the corresponding assumed turned movements. A red filled box indicates an unacceptable LOS. You may notice that unacceptable LOS intersections decrease as the assumed turn volume decreases.

	AM (10% turn)		PM (10% turn)		AM (5% turn)		PM (5% turn)		AM (no turn)		PM (no turn)	
Intersection	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Kent (northern)	1.1	H	1.06	G	1.02	G	0.98	F	0.95	F	0.97	F
Kent (southern)	1.66	H	1.04	G	1.02	G	1.01	G	0.56	B	0.67	C
Clinton (northern)	1.23	H	0.86	E	1.23	H	0.63	B	0.68	C	0.53	A
Clinton (southern)	1.06	G	1.04	G	0.81	D	0.93	F	0.8	D	0.46	A
Santa Ynez (northern)	0.96	F	0.72	C	0.68	C	0.61	B	0.65	C	0.61	B
Santa Ynez (southern)	1.12	H	1.04	G	0.69	C	0.97	F	0.66	C	0.96	F
Alvarado St and Sunset Blvd	0.68	C	1.04	G	0.62	B	1.04	G	0.41	A	0.36	B
Glendale Blvd and Santa Ynez St	1.11	H	1.13	H	0.97	F	1.07	G	1.07	G	0.63	B
Coronado St and Sunset Blvd	0.44	B	0.67	C	0.44	A	0.67	C	0.41	A	0.67	C
Coronado St and Kent St	0.41	A	0.35	A	0.38	A	0.35	A	0.35	A	0.35	A



Placing a single pretimed signal will setback more than one intersection because it must designate time to a minor volume, decreasing other intersections' LOS.



Establishing a semi-actuated signal will only designate time to a minor volume when it is present, which will allow free flow for the major volume most of the time.