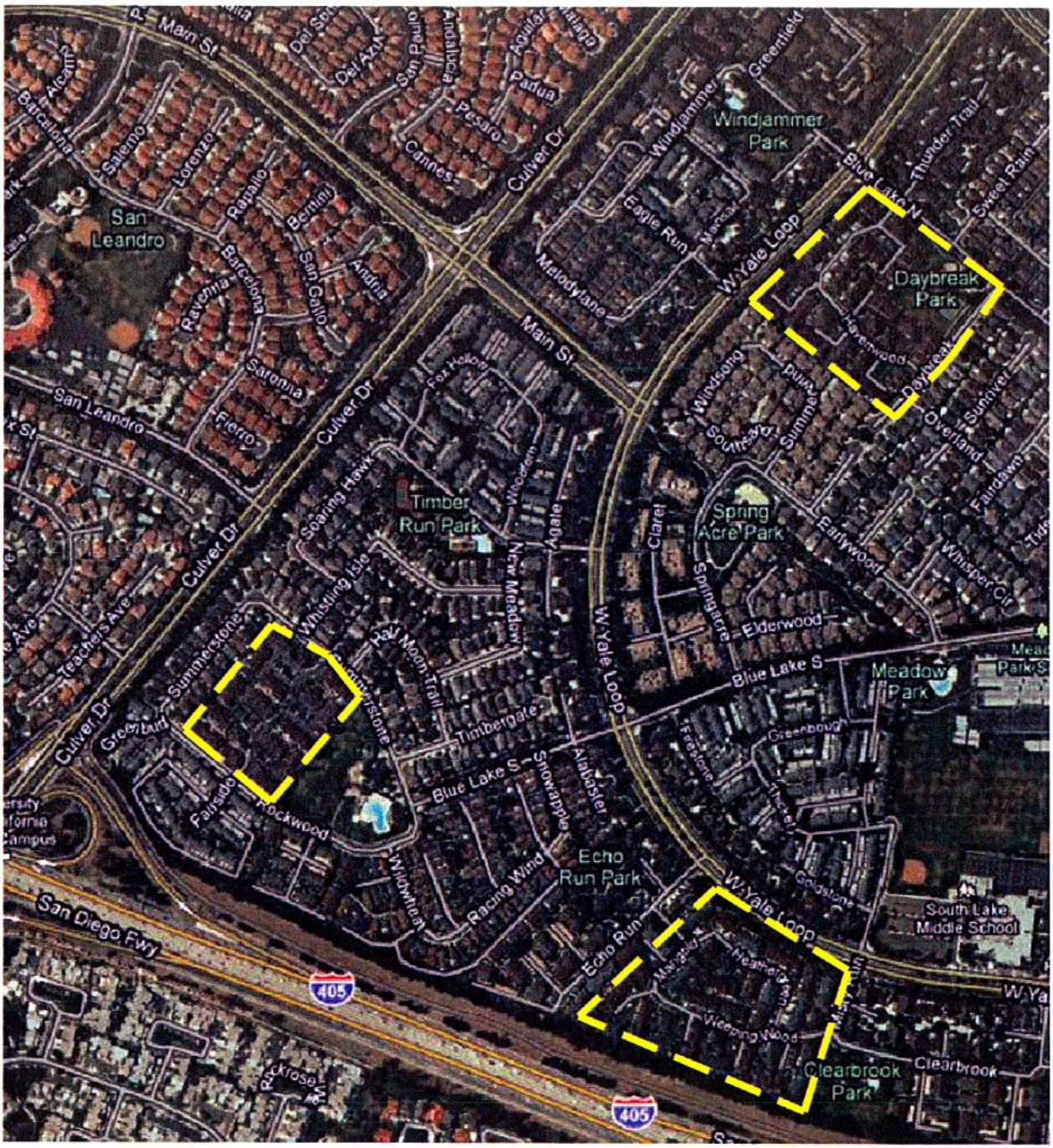
CVC ENFORCEMENT FOR WOODBRIDGE
City of Irvine, California



RK engineering group, inc.

transportation planning • traffic engineering
environmental engineering • parking studies

November 10, 2009

Ms. Jeanean Gillespie
C/O Dr. Toby Spiegel
WOODBRIDGE PARKWAY MAINTENANCE ASSOCIATION
C/O ACTION PROPERTY MANAGEMENT, INC.
2603 Main Street, Suite 500
Irvine, CA 92614-4261

Subject: CVC Enforcement for Woodbridge Community, City of Irvine

Dear Ms. Gillespie:

Introduction

RK ENGINEERING GROUP, INC. (RK) has completed a traffic review within three locations of the Woodbridge Community. The community is located in the City of Irvine. A site plan for all three (3) locations is provided in Exhibit A-1, B-1 and C-1. All of the streets within the community are CVC enforced and are controlled by the City of Irvine.

The existing traffic controls and roadway design features for the community are shown in Exhibits A-1, B-1 and C-1. The roads throughout all three locations in the community have a curb-to-curb width that ranges between 22 feet and 28 feet in width, as noted in Exhibit A-1, B-1 and C-1. The association streets are two-lane undivided roadways and sidewalks are provided for pedestrians. Currently, the speed limit posted is not posted within the community, however since this is a residential neighborhood, the state prima facie speed limit is 25 mph. On-street parking is restricted in some areas and street lighting is sufficient.

Photographs taken within the communities are attached in Appendix A.

The purpose of this traffic review is to evaluate existing conditions and make recommendations with respect to fire lanes, vehicle speeds, stop sign placement, traffic calming measures, and other traffic considerations for Woodbridge Community.

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Findings

The following findings have been determined for existing conditions:

1. The existing traffic controls and roadway design features within the community are shown in Exhibits A-1, B-1 and C-1. The roads throughout this community have a curb-to-curb width that ranges between 22 and 28 feet as shown in Exhibit A-2, B-2 and C-2.

2. No parking zones are defined within all three locations of the community by red curbs and "No Parking" signs. The community board is in the process of eliminating some of the red curbs in favor of no parking signs. Please refer to Exhibit A-2, B-2 and C-2 for Existing Conditions.

3. The only street striping available within the community occurs at stop sign locations depicting stop bars and stop legends. For stop sign locations, please refer to Exhibit A-2and B-2.

4. All-way stop signs at the intersection of Heathergreen at Weepingwood are not warranted.

5. There is a sight distance restriction at the intersection of Heathergreen at Weepingwood. Vehicles negotiating a left turn from Heathergreen onto Weepingwood have difficulty viewing oncoming traffic due to vehicles parking on the north side of Weepingwood. It is recommended that a stop sign, stop bar and stop legend be installed at Heathergreen. Additionally parking at the northeast corner of Heathergreen at Weepingwood should be restricted due to the limited sight distance. Please refer to Exhibit A-4 and A-5 for Traffic Control and Parking Recommendations.

6. The existing traffic volumes and speeds within the community are shown in Exhibit A-3 and B-3. The traffic volume on Weepingwood west of Heathergreen is approximately 416 ADT (Average Daily Traffic), west of Weepingwood is 515 ADT and Heathergreen north of Weepingwood is 311 ADT. These daily traffic volumes are consistent with what would be expected within a typical residential neighborhood and they do not appear to be excessive based upon City of Irvine standards.

7. A Radar Speed Survey was taken at three (3) locations within the community. The 85th percentile speeds (the speed that 85th percent of the vehicles are traveling or less) and the 10 mile per hour pace speed (10 mile per hour group of speeds that is most frequent) are also shown in Exhibit A-3 and B-3. A summary of the 85th percentile speeds on the primary roadways is as follows:

Location		85th Percentile Speed
Weepingwood		
• West of Heathergreen	=	24 miles per hour
• East of Heathergreen	=	19 miles per hour
Havenwood		
• Between Daybreak and Blue Lake North	=	30 miles per hour

The speeds on Weepingwood are typical of what would be expected on these types of residential streets. Typically, in residential neighborhoods with the same characteristics as the Woodbridge Community, speeds average between 22 and 27 mph.

The recorded speeds along Havenwood (30 miles per hour) are considered excessive for these types of residential streets. Traffic calming measures are discussed in recommendation number 4 below and Exhibit B-4.

8. The Basic Speed Law states "no person shall drive a vehicle upon a highway at a speed greater than is reasonable or prudent having due regard for weather, visibility, the traffic on, and the surface and width of, the highway, and in no event at a speed which endangers the safety of persons or property." The prima facie speed limit for a residential community is 25 mph.

Recommendations

The following are recommended for consideration by the WOODBRIDGE PARKWAY MAINTENANCE ASSOCIATION:

1. In order for the California Vehicle Code including the proposed "No Parking" signs to be enforced within the community, the WOODBRIDGE PARKWAY MAINTENANCE ASSOCIATION should request that the California Vehicle Code (CVC) be enforced within the Community and signs must be posted at each of the entrances (Weepingwood at Misty Run and Datewood at Echo Run) indicating that the provisions of the CVC are enforced on these roadways. Please see the Appendix for the required Orange County Fire Department (OCFA) signs and procedures. Please see Exhibit A-5, B-5 and C-3 for Red Curb and No Parking Sign Recommendations.

2. No parking signs should be posted at all locations with less than 28' of street width. (According to a Jan Helf of the City of Irvine Code Enforcement, the OCFA has allowed on-street parking for 3 vehicles on the 22' wide street segment east of Heathergreen on Weepingwood). The signs are required to be within 3 feet at the end of each designated fire lane and spaced at a maximum of 50 feet. Please see Exhibit A-5, B-5 and C-3 for details. Please refer to the Appendix D for OCFA Guidelines.

3. Paint 10 feet of red curb at the northeast corner of Heathergreen at Weepingwood to improve site distance. This is a blind intersection and it is important that vehicles be offered the opportunity to negotiate the left hand turn from Heathergreen to Weepingwood. Cars parked in this area are a threat to active vehicles. Exhibit A-5 shows recommendations.

4. A stop sign, stop bar and stop legend should be provided at Heathergreen in order to control traffic negotiating the left or right turn on to Weepingwood. Exhibit A-4 shows recommendations.

5. In order to provide adequate traffic control, a stop sign, stop bar and stop legend should be provided on Datewood at Echo Run and on Datewood at Marigold. Sight distance is also a concern at these locations. Exhibit A-4 shows recommendations.

6. Based upon the existing speed surveys along Weepingwood, the appropriate speed limits on the primary and secondary streets in the neighborhood is 25 miles per hour. This is consistent with other typical residential communities. It should be noted that the installation of a sign is not an effective traffic calming measure. Speed limit signs can be installed within the community as 25 MPH if desired.

7. Install centerline double yellow striping on the bend at Marigold, Heathergreen and Havenwood as shown in Exhibit A-4 and B-4. The striping should be consistent with Caltrans Detail 22 striping. This type of striping is aimed at narrowing the driving lanes. This will allow vehicles to negotiate this bend in the road more safely and be mindful of the limits to each driving direction. Many studies as well have proven this to be a very effective and relatively inexpensive method of traffic calming.

8. If the WOODBRIDGE PARKWAY MAINTENANCE ASSOCIATION would like to consider additional traffic calming measures to further reduce speeds along Havenwood, consideration could be given to install speed humps or speed cushions. Speed hump or speed cushion installation would have to be reviewed by the OCFA to ensure that they will not adversely affect the emergency response times within the community.

9. It is recommended that a follow-up radar speed survey and site visit within twelve (12) months (after installation of the double yellow center line) should be conducted on Havenwood in order to review vehicle speeds. Further traffic calming recommendations could be identified at this time if speeding is still an issue.

Traffic Analysis Specifications

RK has completed a traffic review of the Woodbridge Community. The residential neighborhood is located in the City of Irvine. The community site plans are provided in Exhibit A, B and C.

Radar speed surveys were conducted at three (3) locations within the community on October 15, 2009. The 85th percentile speeds and 10 mile per hour pace speeds are shown in Exhibit A-3 and B-3 and the radar speed surveys are included in the Appendix B. The speeds recorded along Weepingwood are consistent with the speeds in similar communities. If the community would like to further reduce vehicle speeds along Weepingwood, traffic calming measures could be implemented to further reduce speeds if desired. However, the speeds recorded along Havenwood are considered excessive. Traffic calming measures have been recommended for the 90 degree bend at Havenwood.

RK reviewed all-way stop warrants at the intersection of Heathergreen and Weepingwood. All-way stop warrants based on the Manual of Uniform Traffic Control Devices (MUTCD) are included in Appendix C. Based upon this evaluation, all-way stops are not warranted at this location. However, due to the limited sight distance, a stop sign has been recommended for this intersection.

Traffic Calming Discussion

If the community would like to reduce speeds from current conditions, additional traffic calming would be required. It should be noted that the current speeds are consistent with other residential neighborhoods and are not excessive in comparison to other streets of similar characteristics. Traffic calming is a means of reducing roadway speed and volume by the use of roadway design features. The use of speed cushions would have to be approved by the Orange County Fire Authority (OCFA).

Striped roadway narrowing, as shown in Exhibit A-4 and B-4, provides a visual reduction in perceived roadway width helps to reduce traffic speeds. This design feature is inexpensive and effective, while being the least detrimental to the aesthetical qualities of the community.

Installation of traffic calming devices (i.e., striped roadway narrowing, choker, median, and pavement texture) should be supported by a large majority of the homeowners, since they will affect all residents within the community. It should be noted that traffic calming devices should be reviewed and approved by the appropriate services departments (i.e., fire and police) to ensure that they will not adversely affect emergency response times within the community.

It should be noted that the Orange County Fire Authority has recently specified that speed cushions, as shown in the Appendix D are the preferred measures for traffic calming.

Conclusions

RK has completed a traffic review of the Woodbridge Community Association. This review has evaluated existing traffic volumes, parking restrictions, roadway speeds, and sight distance within the community. As noted in this report, current conditions do not indicate excessive speeds along Weepingwood within the community, based upon what is typically expected for residential collector and local streets.

Several recommendations with respect to the parking zones, stop signs and street striping are included in the Recommendations section of this report and are summarized in Exhibit A-4, A-5 B-4, B-5 and C-3.

If the community feels that they would like to reduce speeds, then the installation of traffic calming devices (i.e., speed cushions, etc.) could be considered within the community. RK appreciates this opportunity to work with the Woodbridge Parkway Maintenance Association on this project.

If you have any questions regarding this study or need further review, please call us at (949) 474-0809.

Sincerely,
RK ENGINEERING GROUP, INC.

Robert Kahn, P.E.
Principal

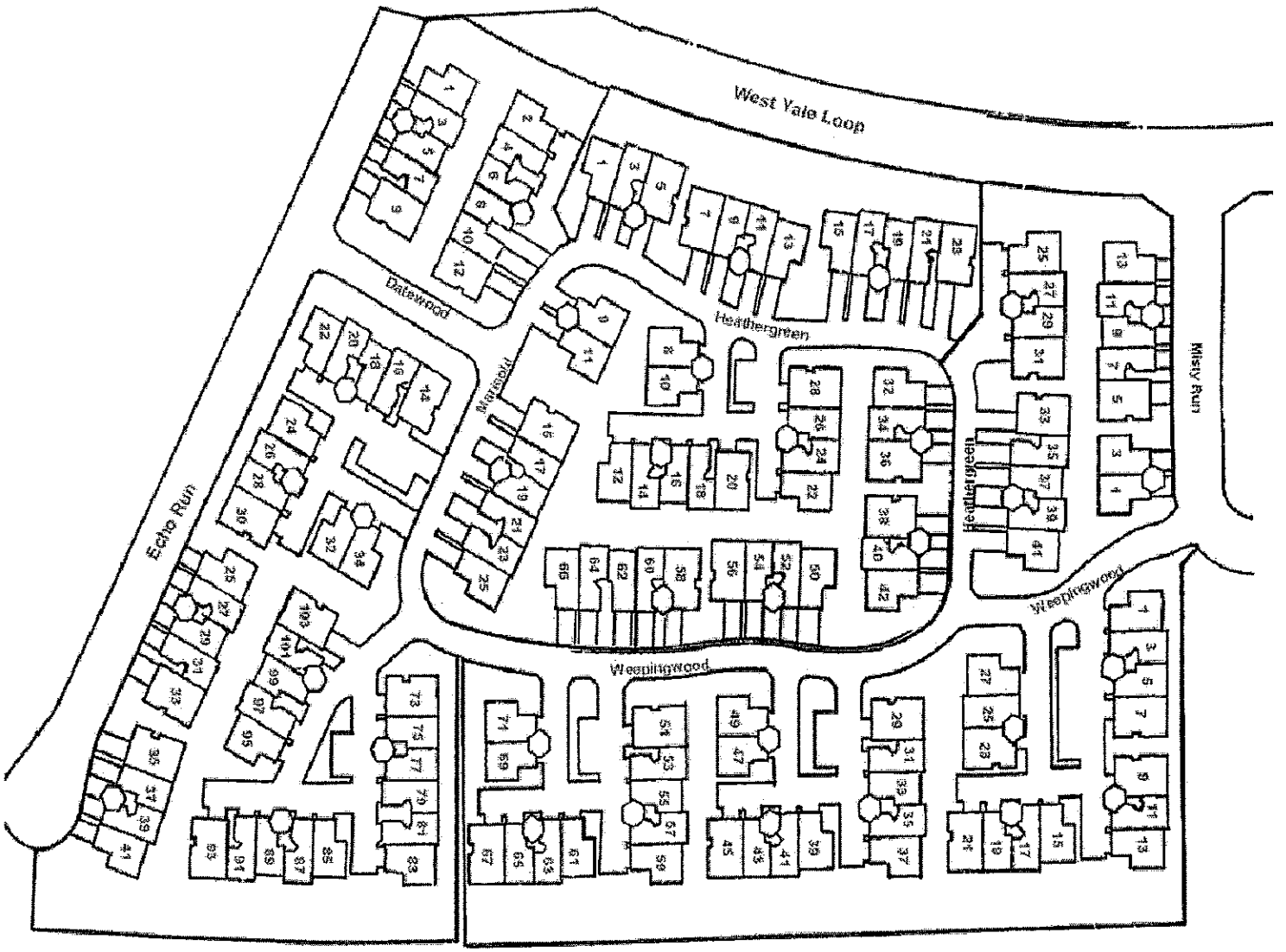
Rogier Goedecke
Vice President, Operations

Attachments

Exhibits

Exhibit A-1

Woodbridge Community Site Plan



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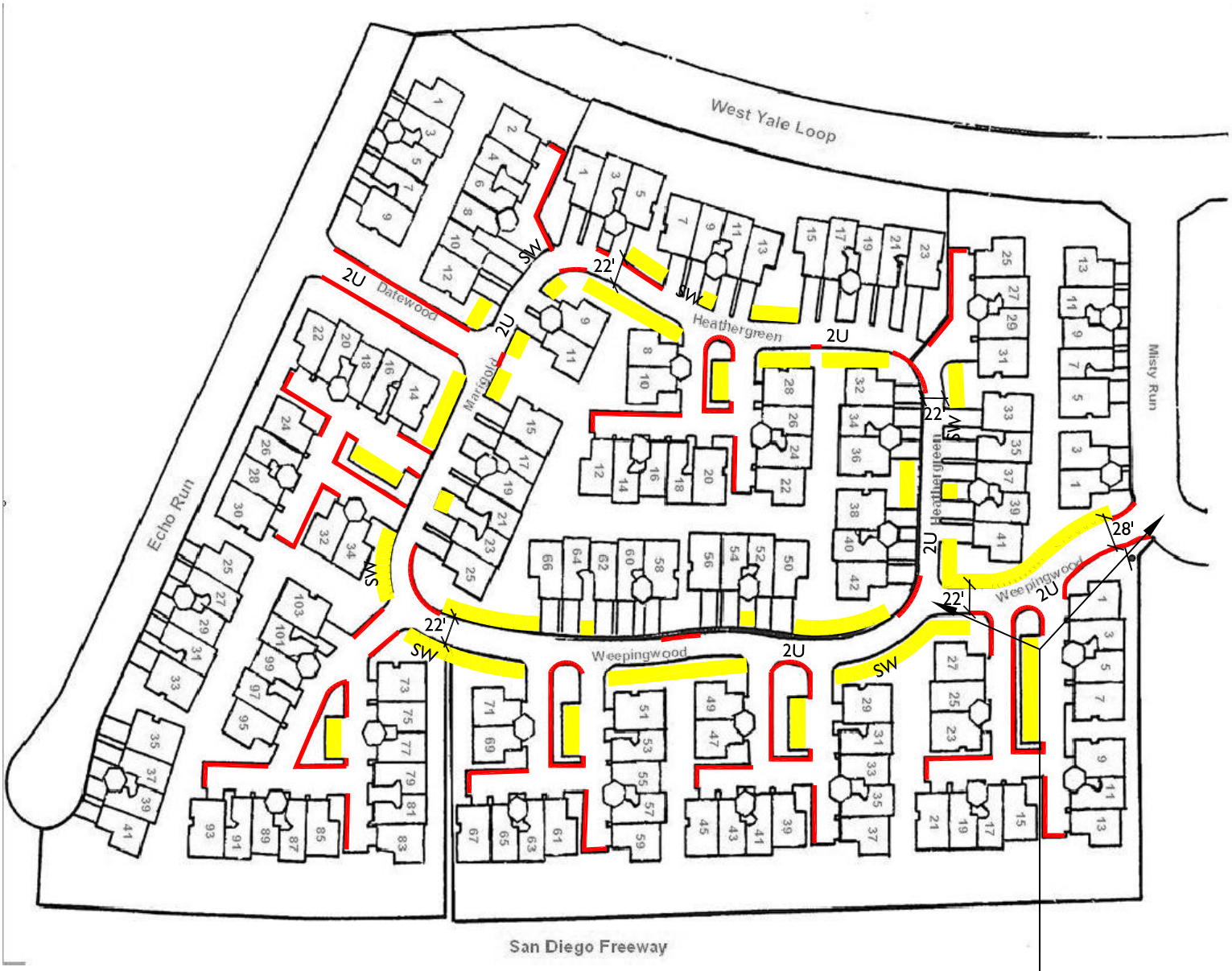
RK engineering group, inc.

Exhibit A-2

Existing Conditions



Note: Distance from Weepingwood/ Heathergreen to Weeping wood/ Misty Run = 158 feet.

Legend:

- = Parking Space
- = Red Curb
- = Stop Sign
- 2 = Number of Lanes
- U = Undivided
- SW = Sidewalk
- 22 ft. = Roadway Width

N

RK engineering group, inc.

Exhibit A-3

Speed Survey Results

Legend:

515 = 2-Way ADT

19 Mph	=	85th % Speed
12-21 Mph		10 Mph Pace Speed

N

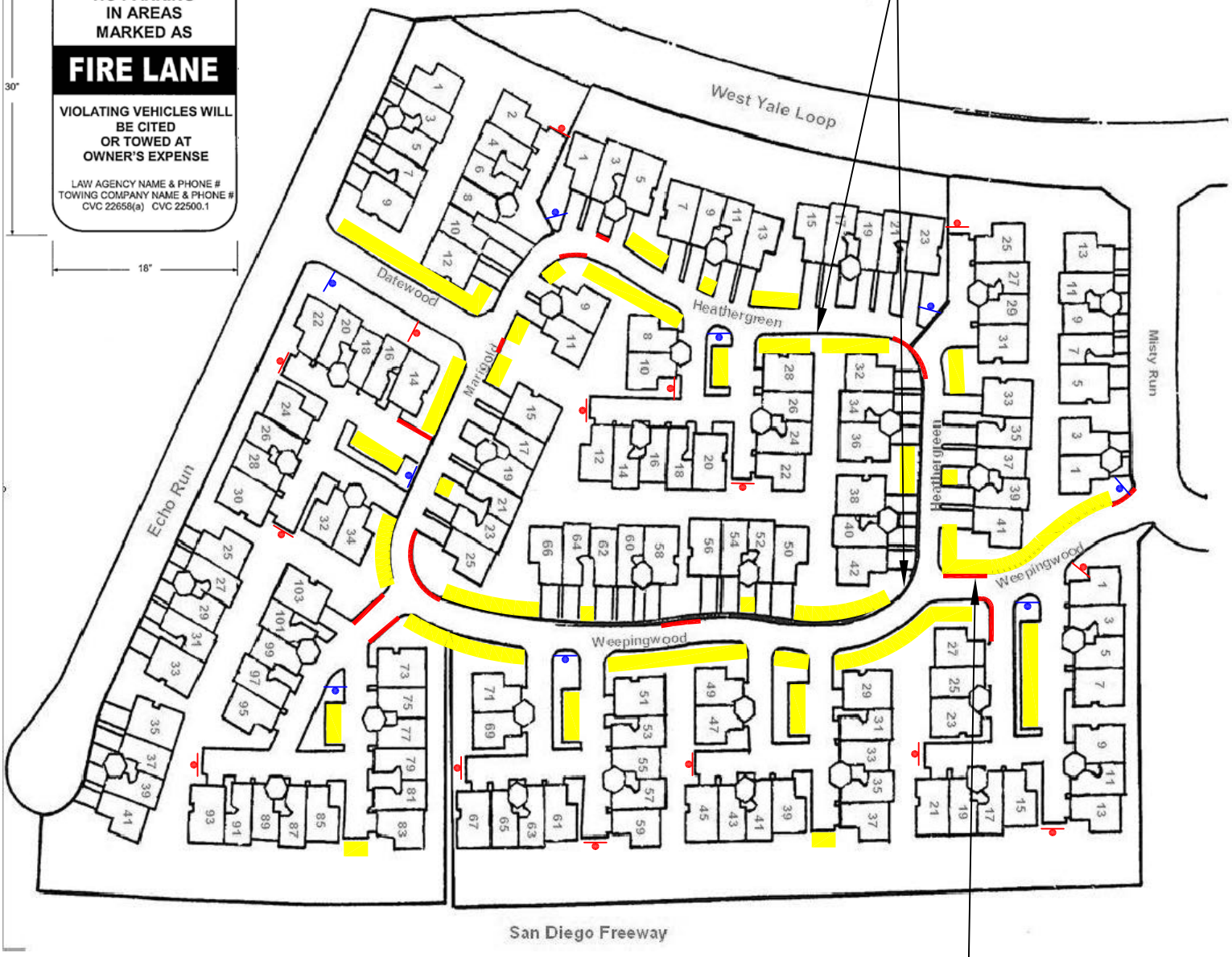
Exhibit A-4

Traffic Control Recommendations

Exhibit A-5

Red Curb and No Parking Sign Recommendations

Attachment 10



Attachment 12

Legend:

- = Attachment 10 Fire Lane Entrance Signs (9 total)
- = Attachment 12 Fire Lane No Parking Signs (15 total)
- = Parking Space
- = Red Curb

General Notes:
Replace all existing "No Parking" signs that are not legible and reflective.

N

Exhibit B-1

Woodbridge Community Site Plan

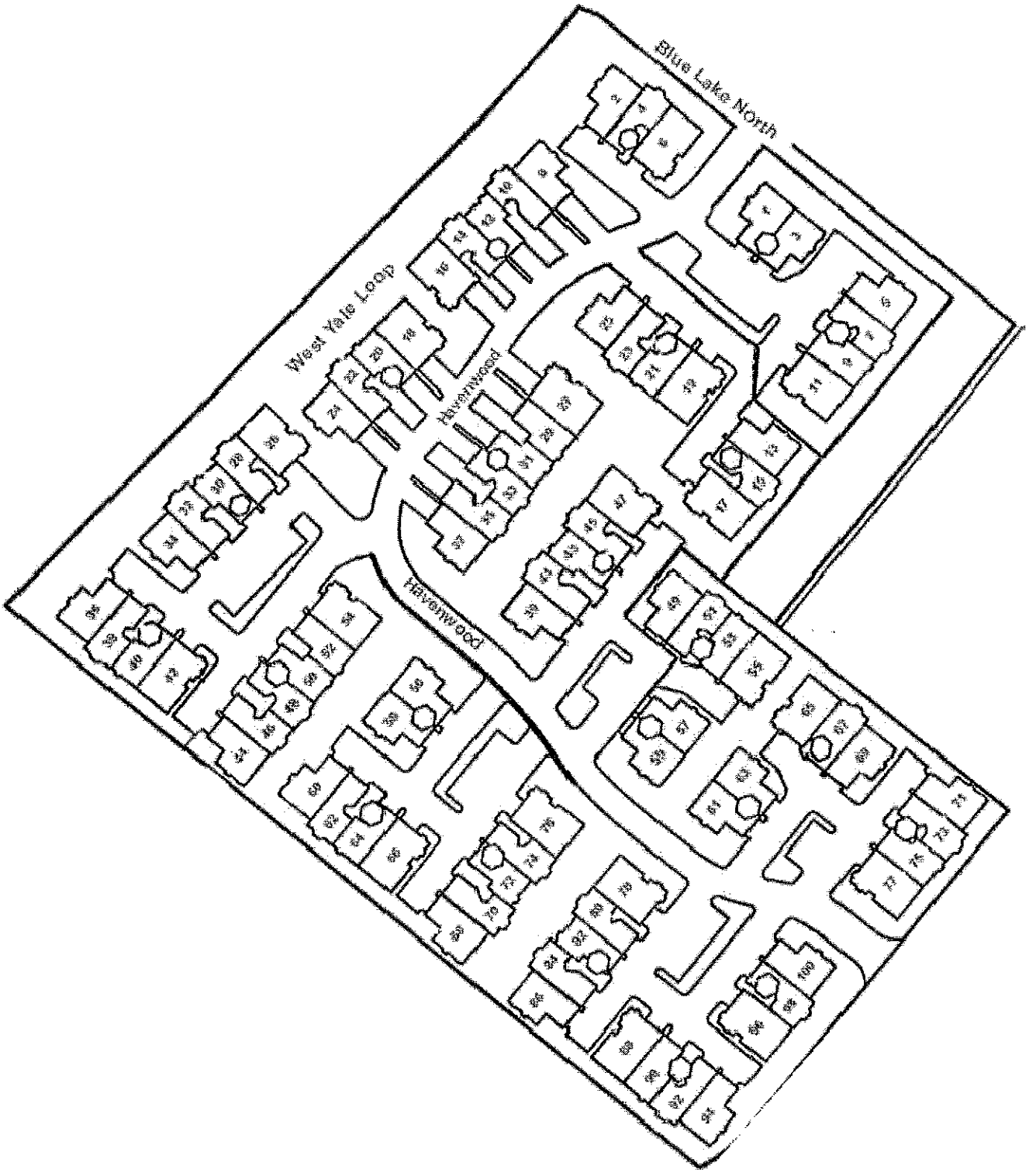


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Exhibit B-2

Existing Conditions

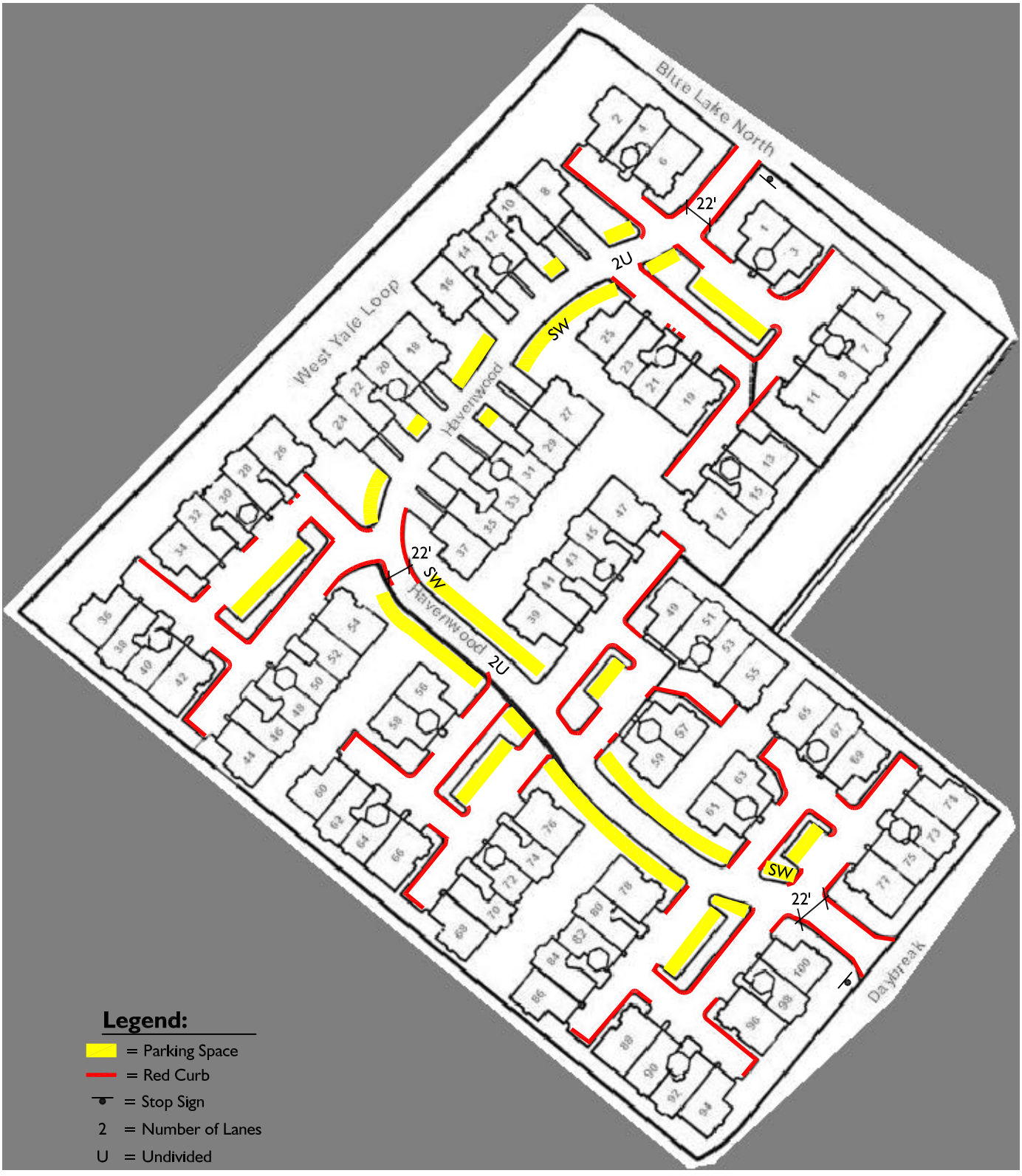
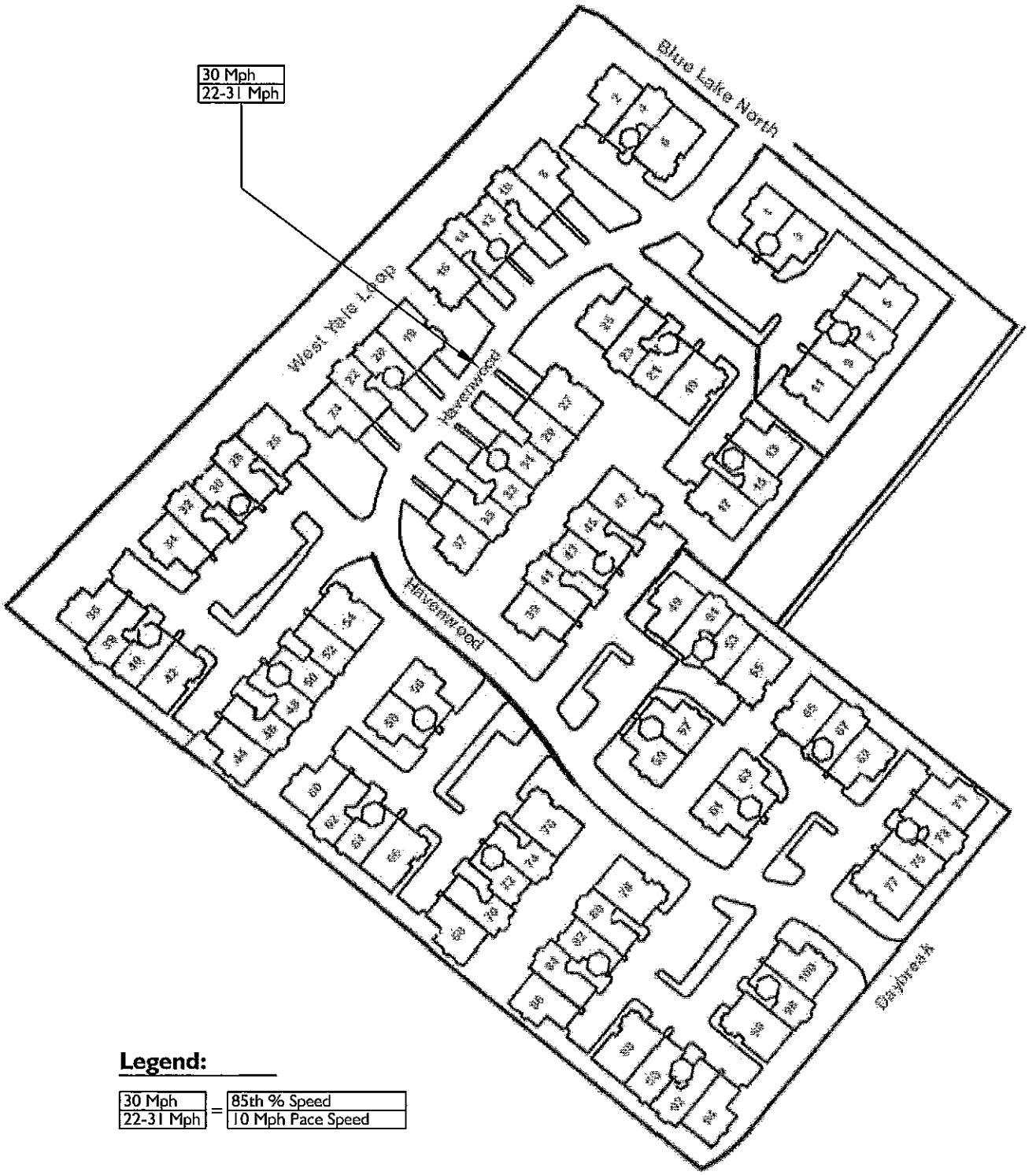


Exhibit B-3

Speed Survey Results



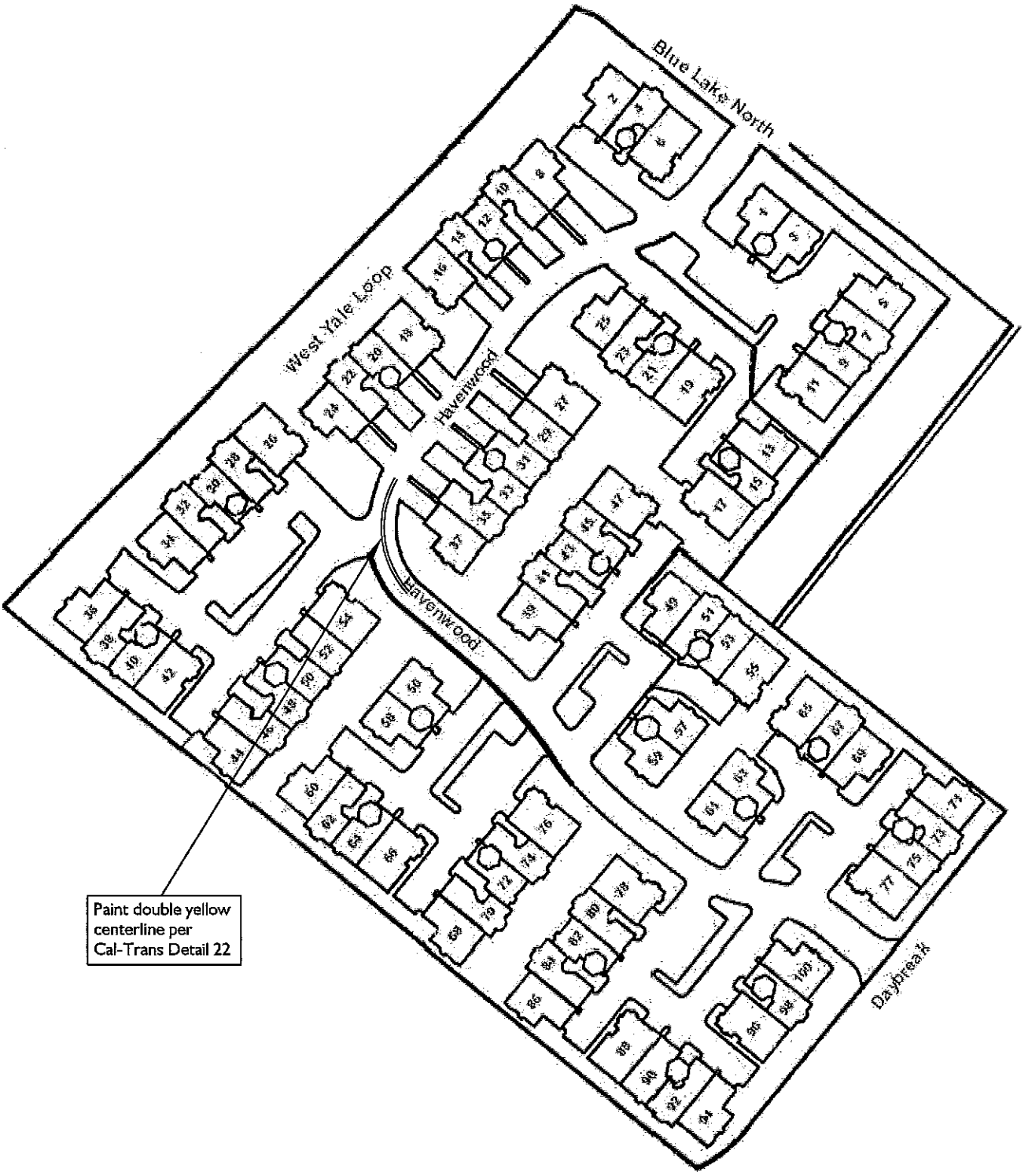
Legend:

30 Mph 22-31 Mph	=	85th % Speed 10 Mph Pace Speed

N

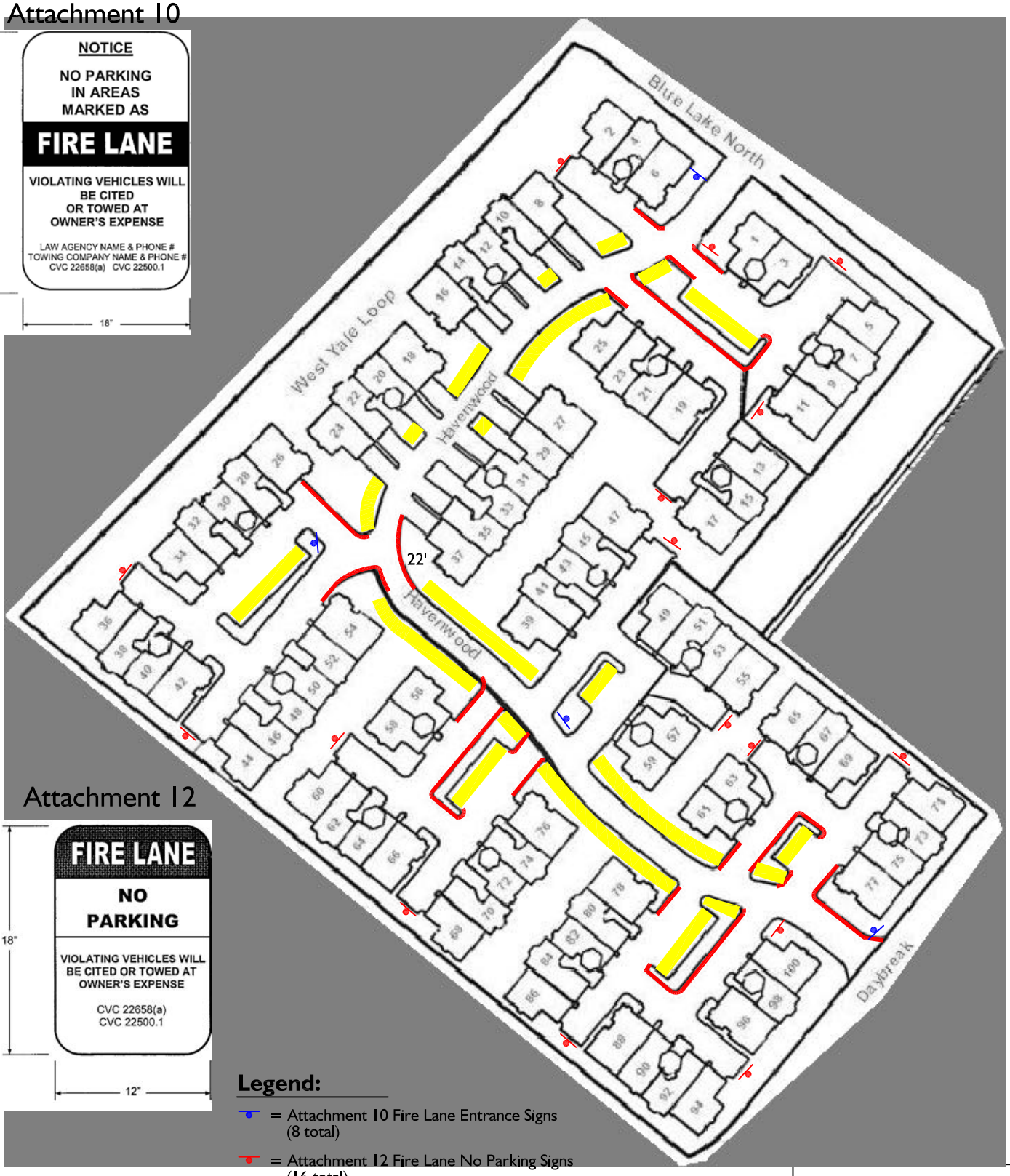
Exhibit B-4

Traffic Calming Recommendations



Red Curb and No Parking Sign Recommendations

Attachment 10



Attachment 12

Legend:

- = Attachment 10 Fire Lane Entrance Signs (8 total)
- = Attachment 12 Fire Lane No Parking Signs (16 total)
- = Parking Space
- = Red Curb

Replace all "No Parking" signs that are not legible and reflective.

N

RK engineering group, inc.

Exhibit C-1

Woodbridge Community Site Plan

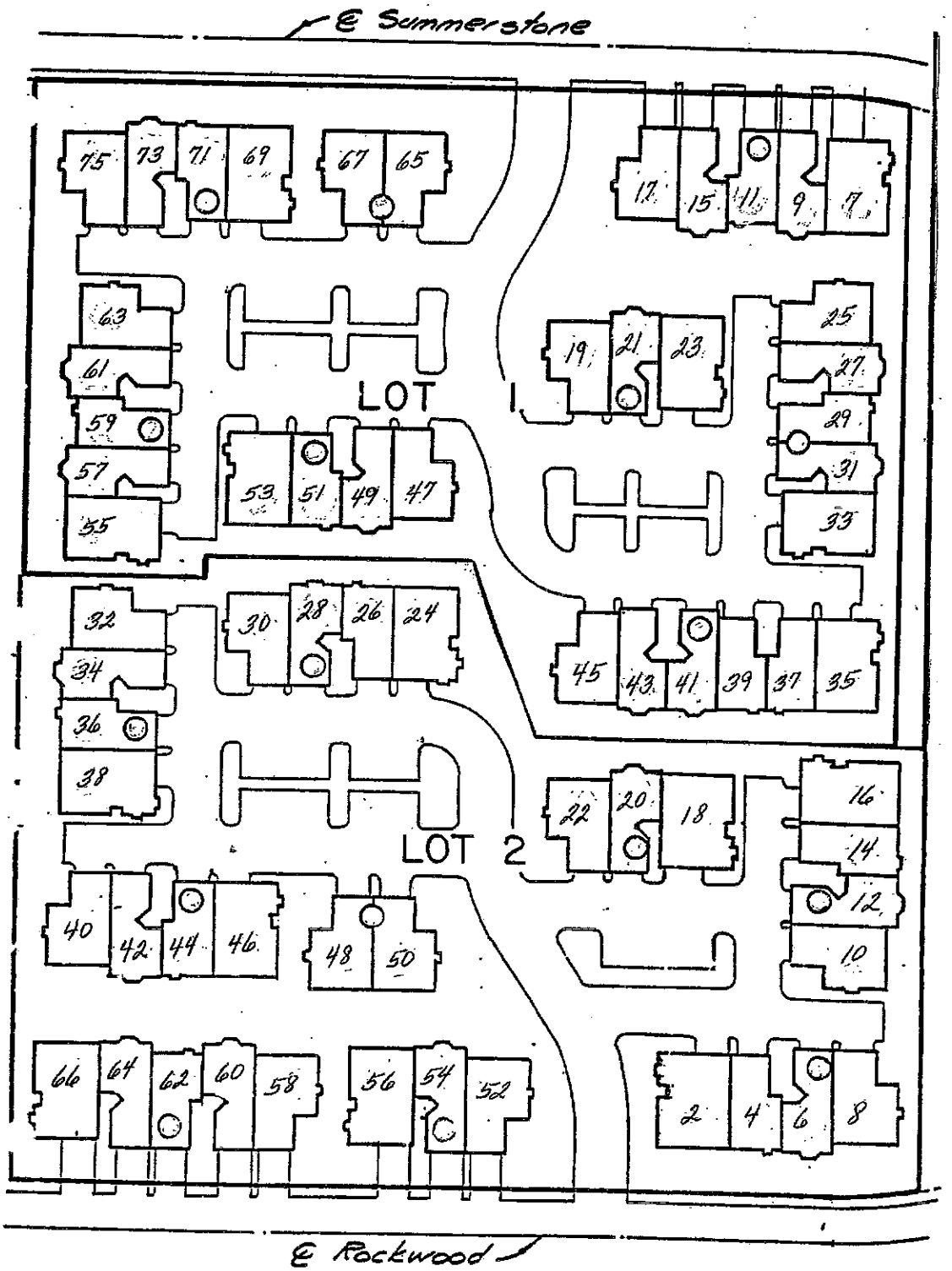


Exhibit C-2

Existing Conditions

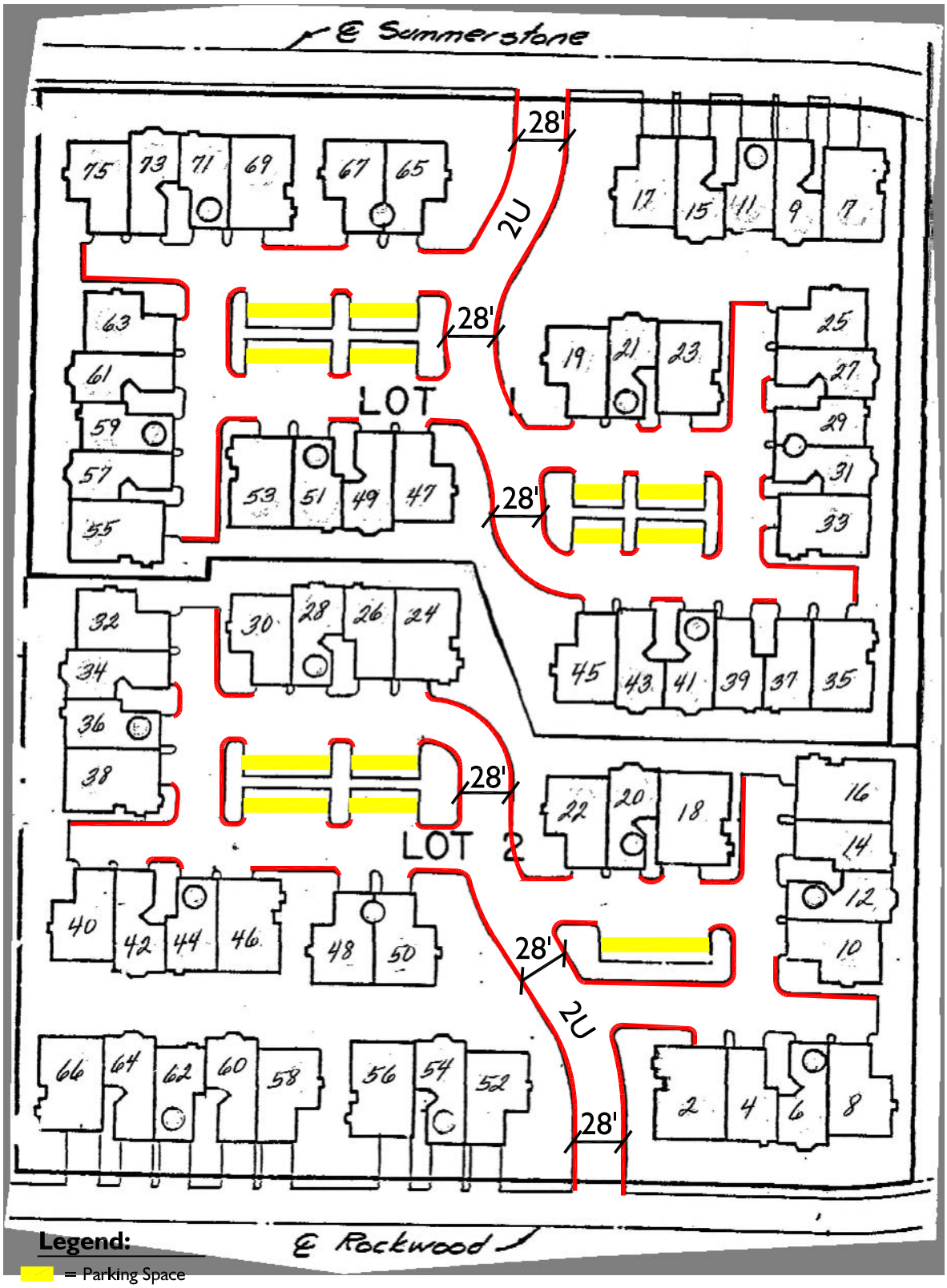
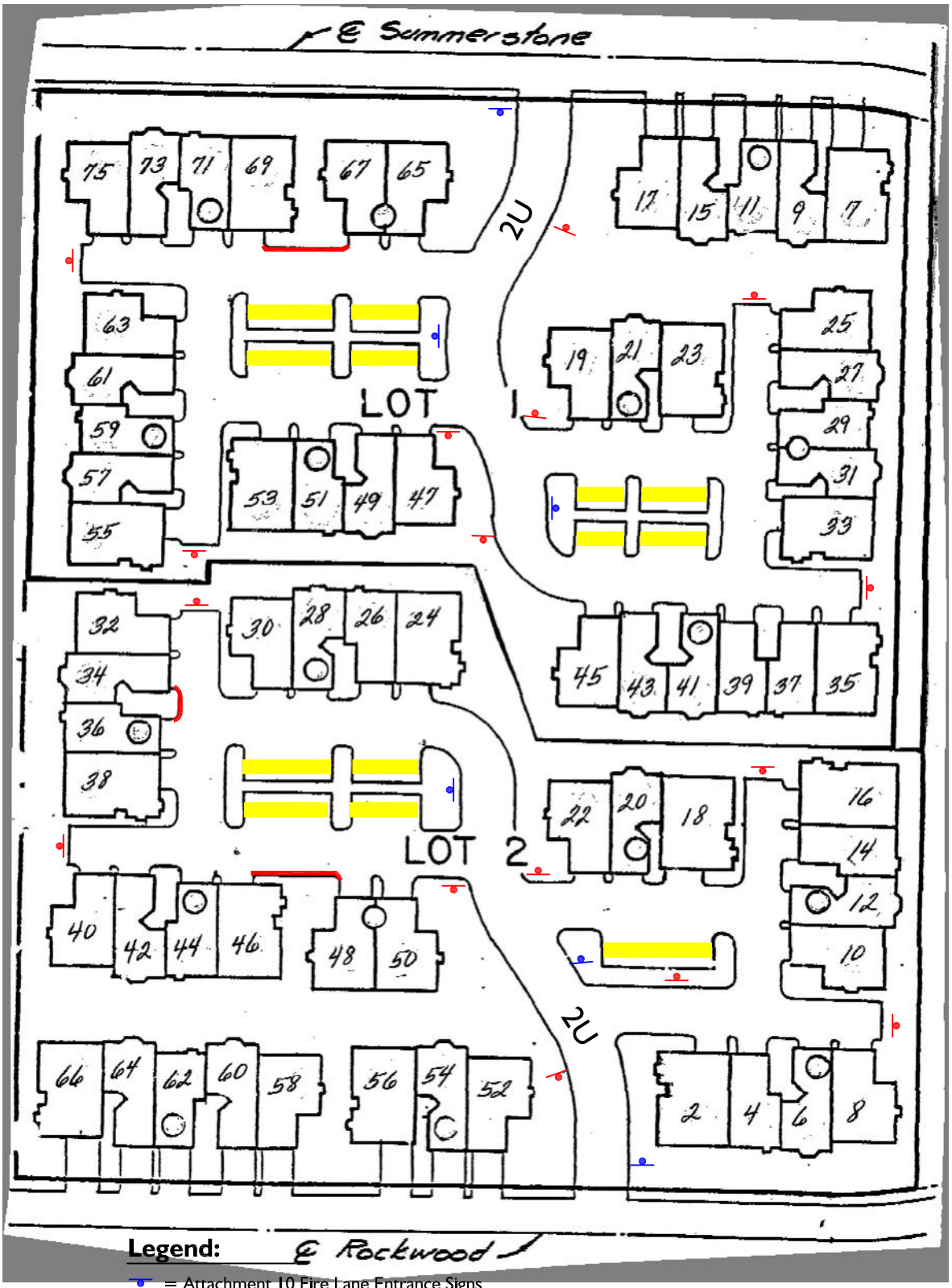


Exhibit C-3

Red Curb and No Parking Sign Recommendations



Attachment 10

Attachment 12

Legend:

= Attachment 10 Fire Lane Entrance Signs (6 total)

= Attachment 12 Fire Lane No Parking Signs (16 total)

= Parking Space

= Red Curb

N

General Notes:
Replace all "No Parking" signs that are not legible and reflective.

RK engineering group, inc.

Appendices

Appendix A

Photographs

Appendix A-1

Weepingwood / Heathergreen Aerial

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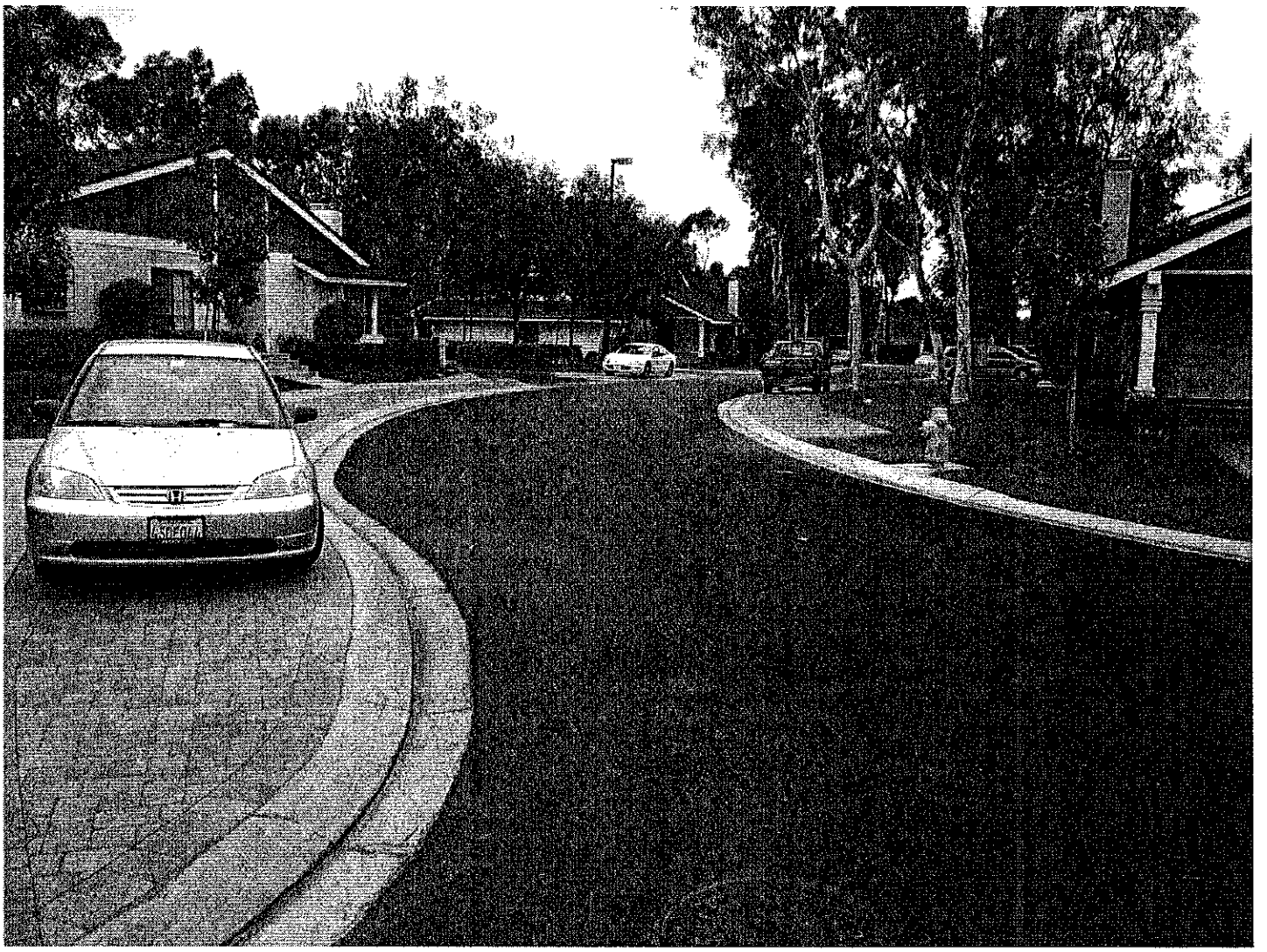
Appendix A-2

Westbound View on Weepingwood at Heathergreen



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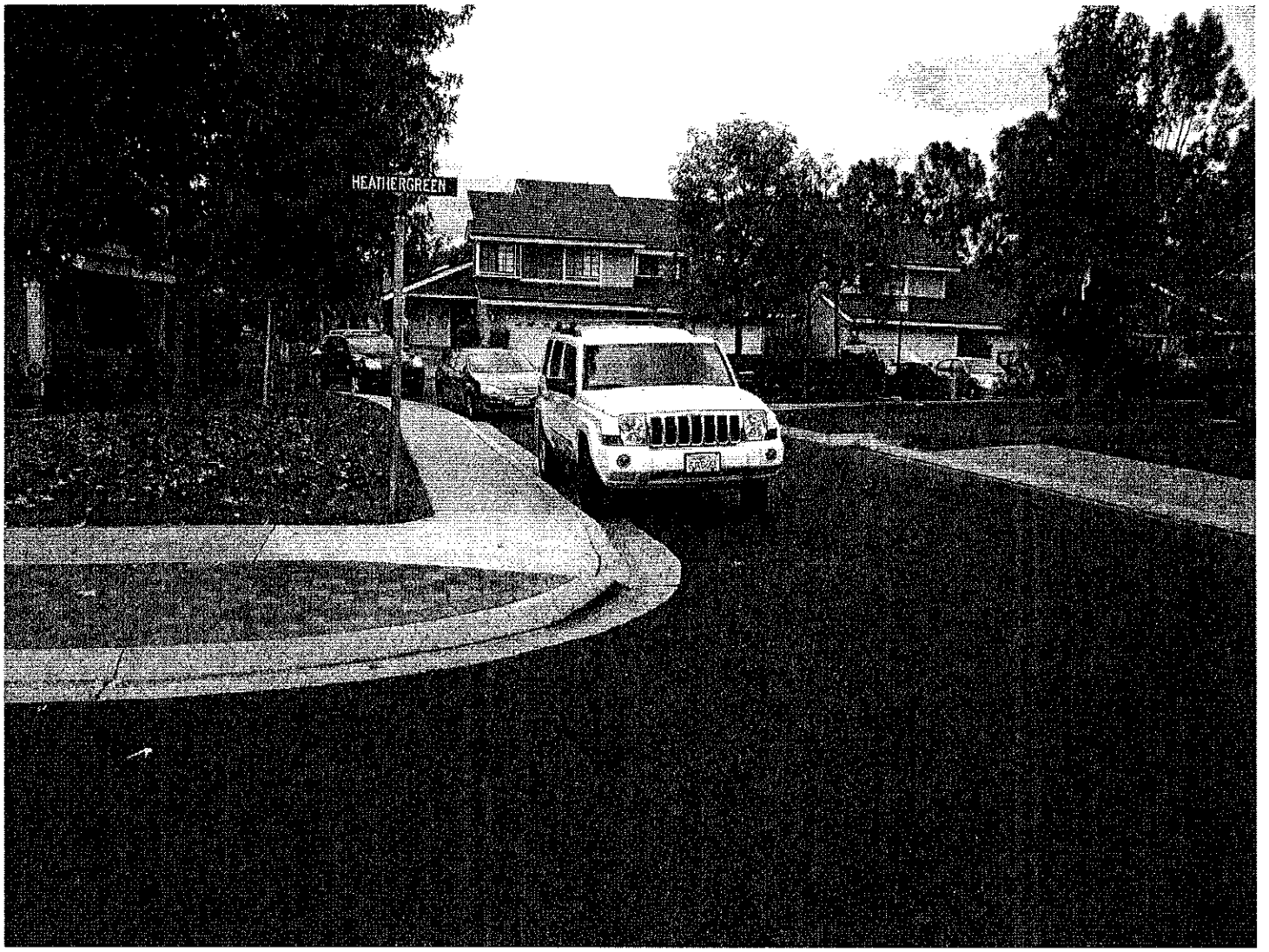
Appendix A-3

Eastbound View Heathergreen at Weepingwood



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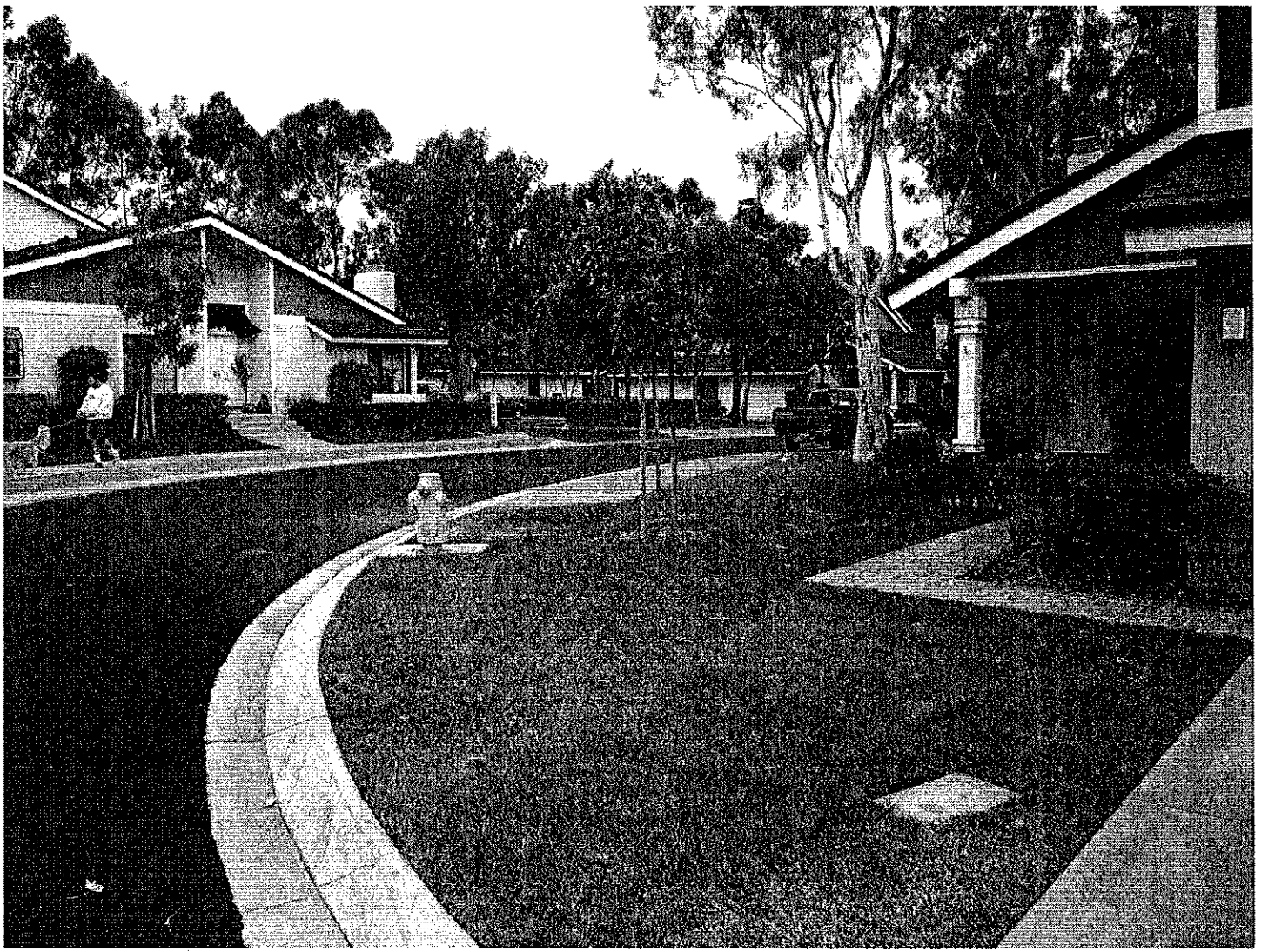
Appendix A-4

Westbound View on Heathergreen at Weepingwood



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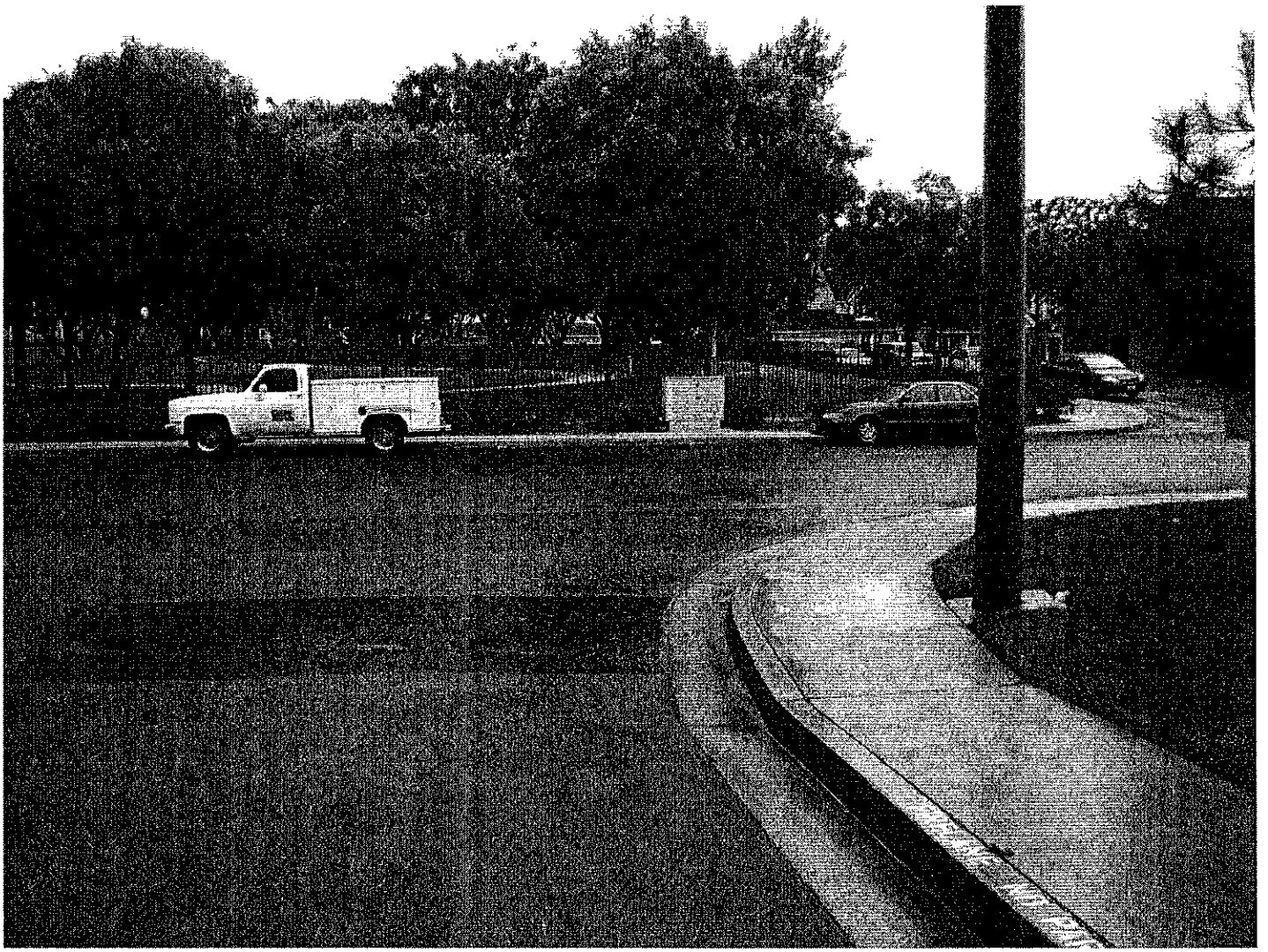
Appendix A-5

Westbound on Datewood at Echo Run



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Appendix A-6

Northbound on Datewood at Echo Run

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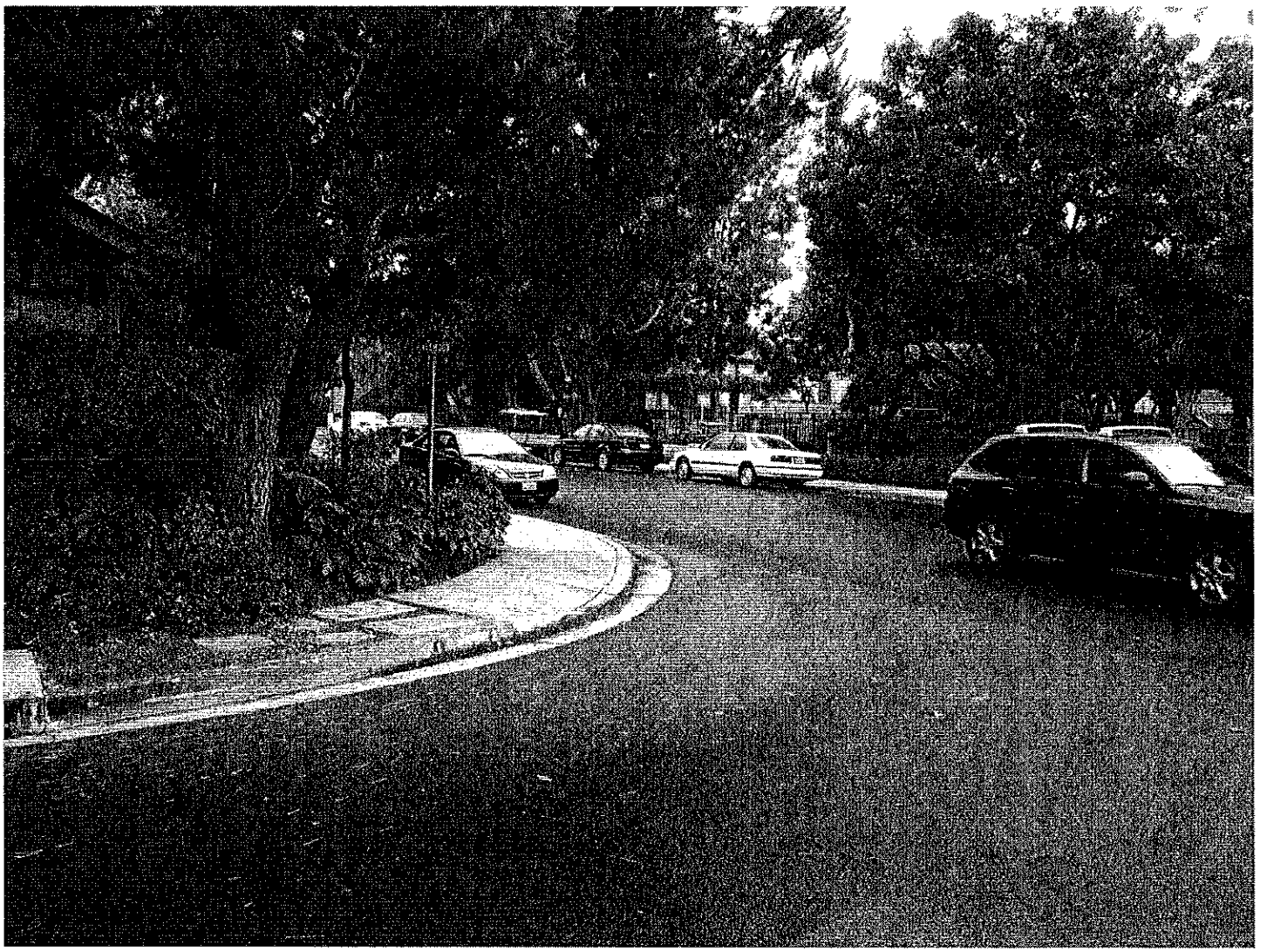
Appendix A-7

Southbound on Datewood at Echo Run



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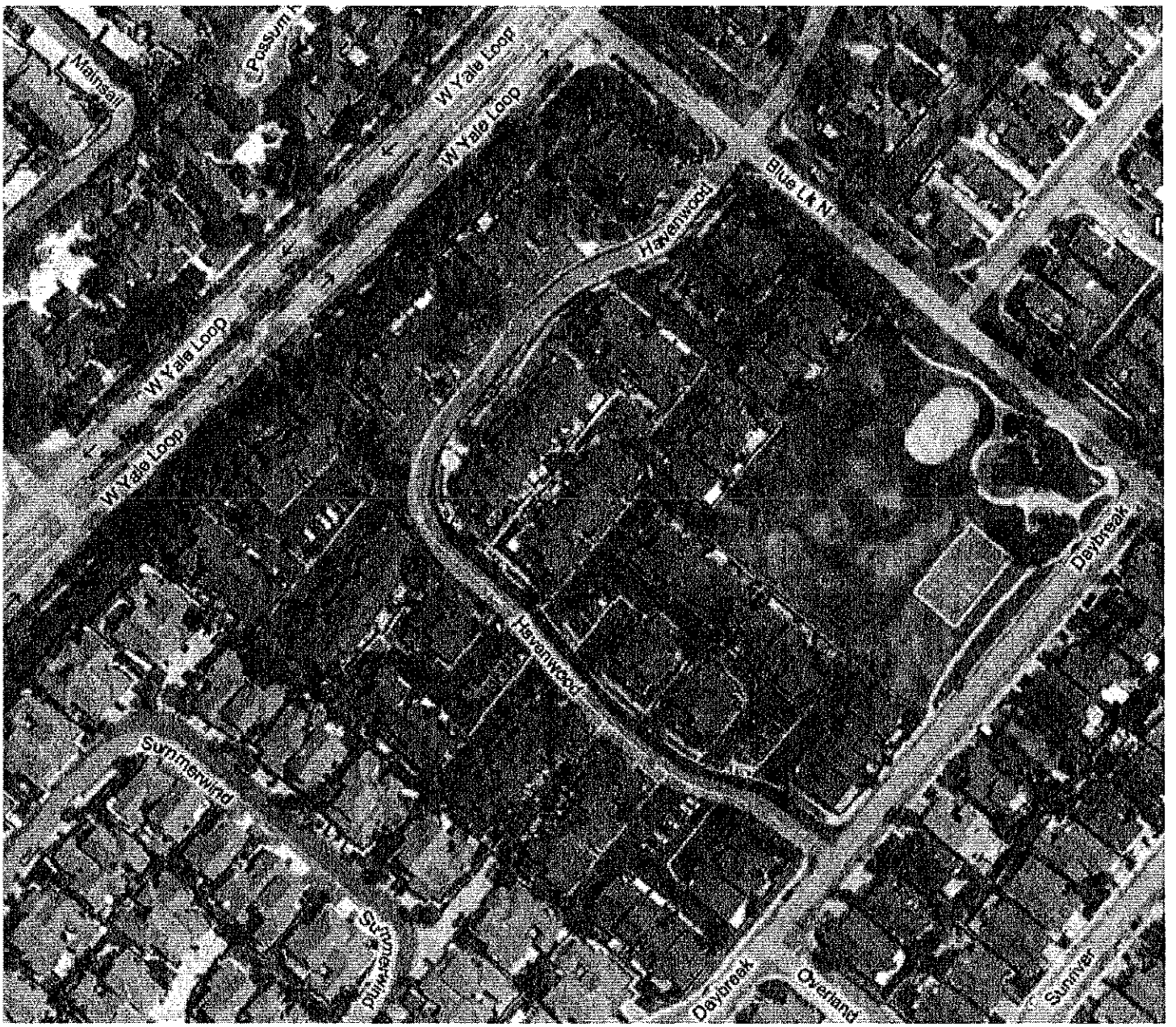
Appendix A-8

Havenwood Aerial



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Appendix B

Radar Speed Survey

Spot Speed Study

Prepared by: Southland Car Counters

City of Irvine

Prepared by National Data & Surveying Services

DATE: 10/15/2009 **Location: Weeping Wood btn Marigold-Heathergreen**

DAY: Thursday **Posted Speed:** 25 MPH **Project #: 09-1142-003**

Northbound Spot Speeds

Speed mph	ALL Vehicles
<=10	
11	
12	
13	
14	
15	
16	1
17	1
18	4
19	8
20	13
21	19
22	12
23	22
24	8
25	5
26	
27	3
28	4
29	
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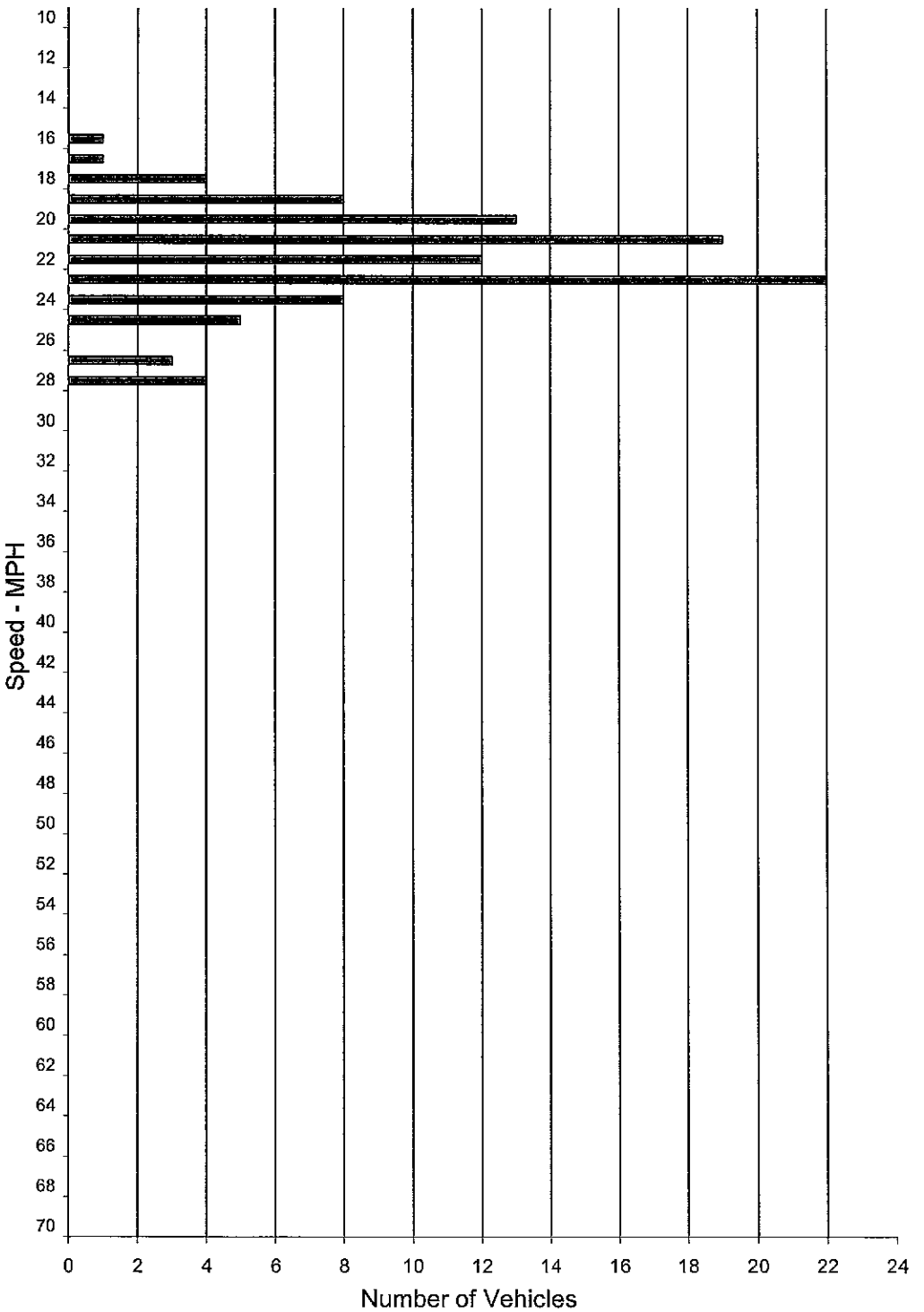

SPEED PARAMETERS										
Class	Count	Average Speed	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	# / % Below Pace	# / % Above Pace
ALL	100	22.0	16 - 28	22 mph	24 mph	18 - 27	94	94%	2% / 2	4% / 4

Spot Speed Study

Prepared by: Southland Car Counters

City of Irvine

Prepared by National Data & Surveying Services

DATE: 10/15/2009 **Location: Weeping Wood e/o Heathergreen**

DAY: Thursday **Posted Speed:** 25 MPH **Project #: 09-1142-002**

Northbound Spot Speeds

Speed mph	ALL Vehicles
<=10	
11	
12	1
13	9
14	12
15	17
16	18
17	12
18	14
19	10
20	6
21	1
22	1
23	
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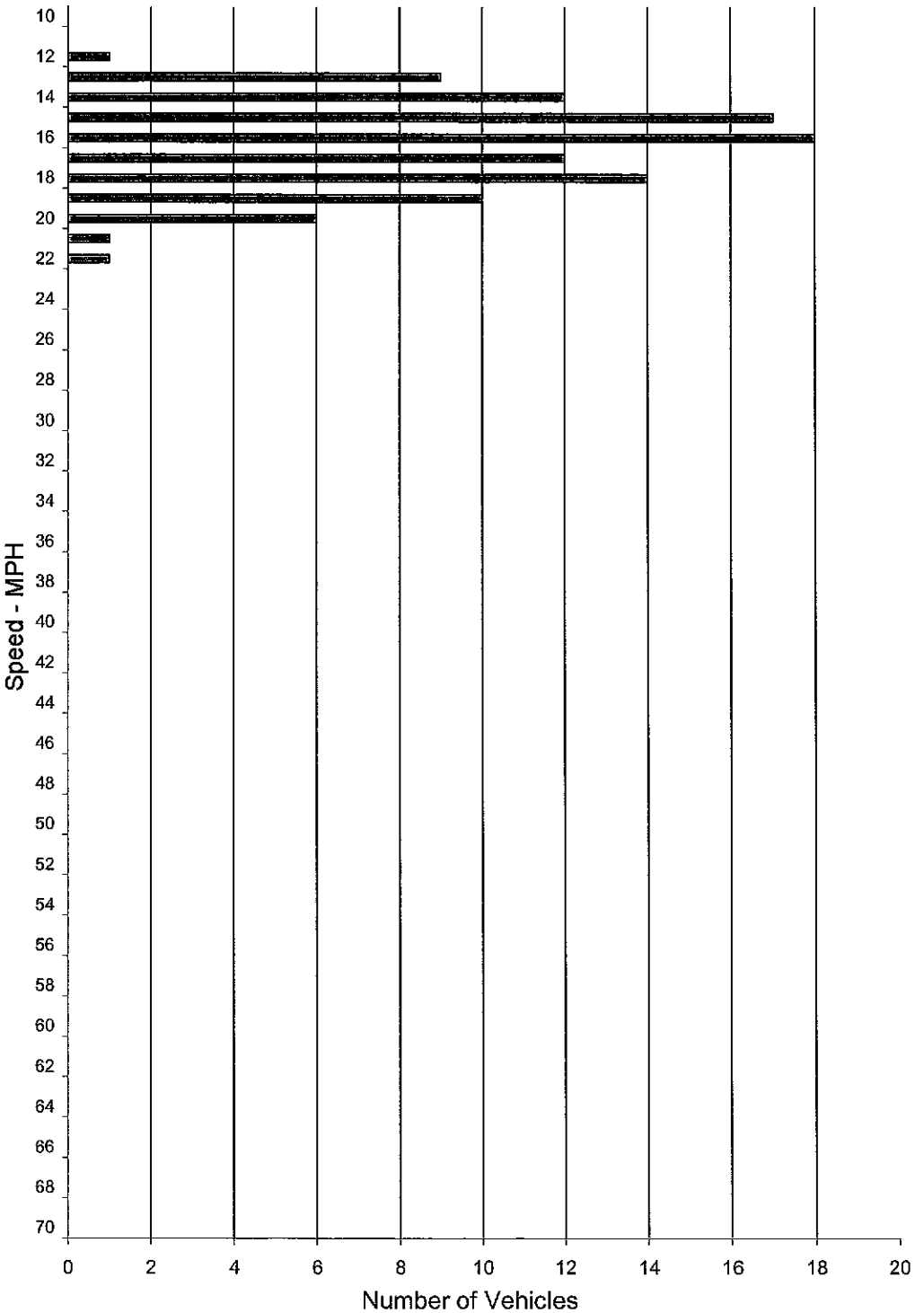

SPEED PARAMETERS										
Class	Count	Average Speed	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	# / % Below Pace	# / % Above Pace
ALL	101	16.3	12 - 22	16 mph	19 mph	12 - 21	100	99%	0% / 0	1% / 1

Spot Speed Study

Prepared by: Southland Car Counters

City of Irvine

Prepared by National Data & Surveying Services

DATE: 10/15/2009 **Location: Havenwood s/o Blue Lake N.**

DAY: Thursday **Posted Speed:** 25 MPH **Project #: 09-1142-001**

Northbound Spot Speeds

Speed mph	ALL Vehicles
<=10	
11	
12	
13	
14	
15	
16	
17	
18	
19	3
20	
21	4
22	2
23	6
24	10
25	9
26	13
27	15
28	12
29	9
30	8
31	5
32	1
33	2
34	1
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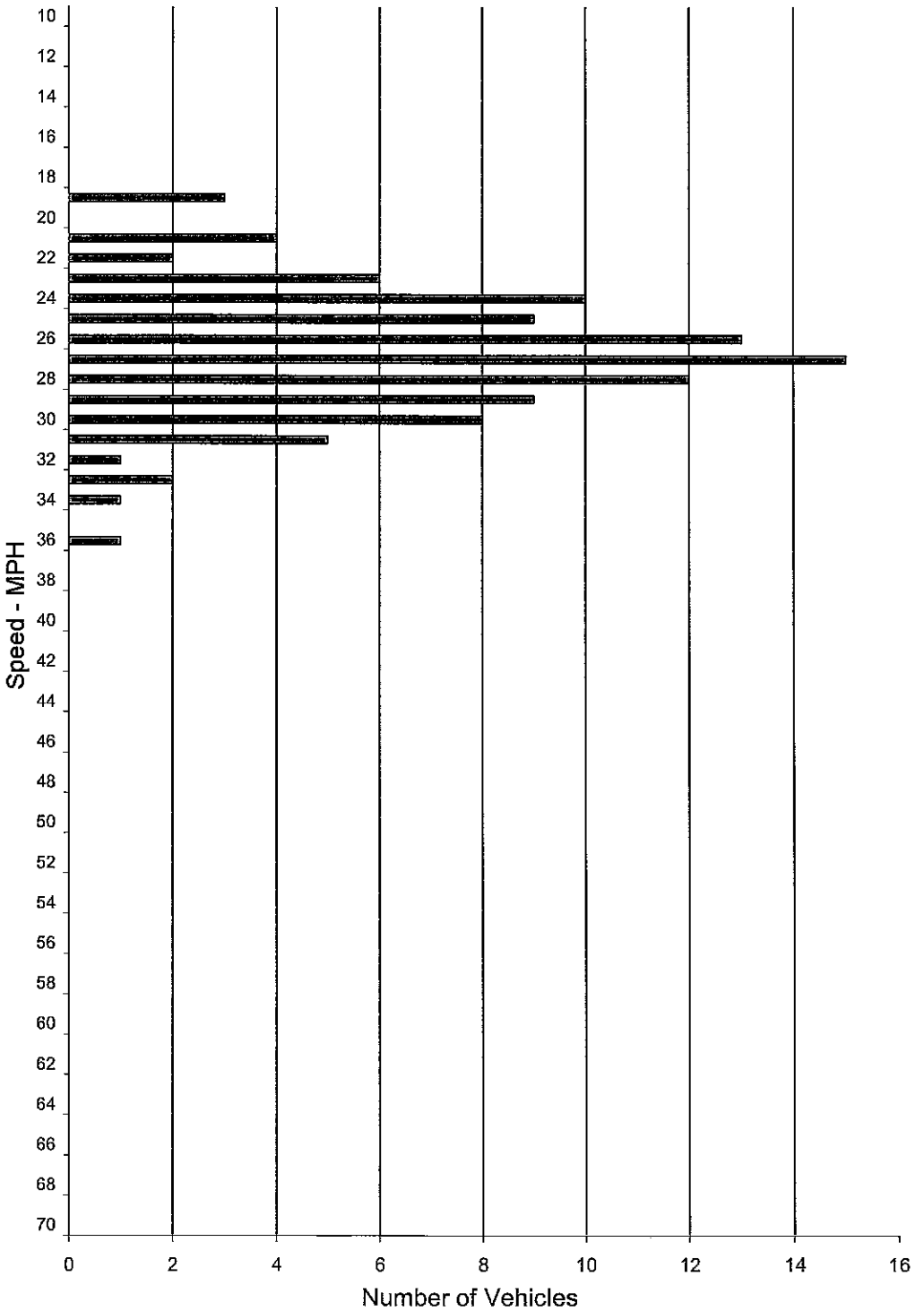


SPEED PARAMETERS										
Class	Count	Average Speed	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	# / % Below Pace	# / % Above Pace
ALL	101	26.6	19 - 36	27 mph	30 mph	22 - 31	89	88%	6% / 7	5% / 5

Appendix C

Average Daily Traffic Counts and All-Way Stop Warrant

Volumes for: Thursday, October 15, 2009 City: Irvine Project #: 09-1141-001

Location: Heathergreen (N-leg) SB@ Weeping Wood

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	0		0					12:00	0		1				
00:15	0		0					12:15	4		6				
00:30	0		0					12:30	4		3				
00:45	0	0	0	0				12:45	3	11	2	12			23
01:00	0		0					13:00	1		4				
01:15	0		0					13:15	0		0				
01:30	0		0					13:30	1		1				
01:45	0	0	0	0				13:45	11	13	3	8			21
02:00	0		0					14:00	0		3				
02:15	0		0					14:15	1		2				
02:30	1		1					14:30	0		0				
02:45	0	1	0	1			2	14:45	3	4	3	8			12
03:00	0		0					15:00	0		1				
03:15	0		0					15:15	1		1				
03:30	0		0					15:30	1		4				
03:45	0	0	0	0				15:45	1	3	1	7			10
04:00	0		0					16:00	3		1				
04:15	0		0					16:15	3		3				
04:30	0		2					16:30	1		3				
04:45	0	0	1	3			3	16:45	12	19	4	11			30
05:00	1		1					17:00	14		3				
05:15	0		1					17:15	1		0				
05:30	0		0					17:30	2		1				
05:45	0	1	1	3			4	17:45	9	26	4	8			34
06:00	0		0					18:00	1		7				
06:15	0		0					18:15	4		1				
06:30	0		0					18:30	11		6				
06:45	0	0	0	0				18:45	3	19	1	15			34
07:00	0		1					19:00	1		1				
07:15	3		2					19:15	3		5				
07:30	0		3					19:30	1		1				
07:45	4	7	8	14			21	19:45	1	6	1	8			14
08:00	3		4					20:00	0		3				
08:15	4		6					20:15	0		0				
08:30	1		1					20:30	0		1				
08:45	4	12	4	15			27	20:45	3	3	1	5			8
09:00	0		1					21:00	1		1				
09:15	0		0					21:15	3		4				
09:30	1		1					21:30	0		0				
09:45	3	4	4	6			10	21:45	1	5	3	8			13
10:00	0		1					22:00	3		3				
10:15	0		1					22:15	3		4				
10:30	1		1					22:30	1		1				
10:45	1	2	4	7			9	22:45	0	7	0	8			15
11:00	3		4					23:00	1		0				
11:15	0		0					23:15	0		1				
11:30	4		3					23:30	0		0				
11:45	0	7	3	10			17	23:45	1	2	1	2			4
Total Vol.		34		59			**93**			118		100			**218**

	AM			PM			
						Daily Totals	
	NB	SB	EB	WB	NB	SB	EB	WB	**Combined**
	152	159							**311**
Split %	36.6%	63.4%		**29.9%**	54.1%	45.9%			**70.1%**
Peak Hour	07:45	07:30		**07:30**	16:15	17:45			**16:15**
Volume	12	21		**32**	30	18			**43**
P.H.F.	0.75	0.66		**0.67**	0.58	0.64			**0.63**

Volumes for: Thursday, October 15, 2009 City: Irvine Project #: 09-1141-002

Location: Weeping Wood (E-leg) WB@ Heathergreen

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		0			12:00			4		4		
00:15			1		0			12:15			4		5		
00:30			0		0			12:30			4		3		
00:45			0	1	0	0	1	12:45			4	16	6	18	34
01:00			0		0			13:00			7		5		
01:15			1		0			13:15			3		5		
01:30			0		0			13:30			2		7		
01:45			1	2	0	0	2	13:45			4	16	8	25	41
02:00			0		0			14:00			5		2		
02:15			0		0			14:15			1		6		
02:30			1		0			14:30			1		5		
02:45			1	2	0	0	2	14:45			8	15	4	17	32
03:00			0		0			15:00			7		6		
03:15			0		0			15:15			7		6		
03:30			0		0			15:30			3		5		
03:45			0	0	0	0		15:45			5	22	7	24	46
04:00			0		0			16:00			4		8		
04:15			0		0			16:15			7		9		
04:30			1		0			16:30			6		6		
04:45			1	2	0	0	2	16:45			8	25	5	28	53
05:00			1		1			17:00			5		4		
05:15			1		3			17:15			4		6		
05:30			0		0			17:30			2		3		
05:45			1	3	1	5	8	17:45			5	16	5	18	34
06:00			1		2			18:00			6		6		
06:15			0		0			18:15			6		2		
06:30			1		1			18:30			5		3		
06:45			0	2	1	4	6	18:45			5	22	6	17	39
07:00			1		3			19:00			3		3		
07:15			2		2			19:15			5		4		
07:30			2		3			19:30			5		3		
07:45			6	11	1	9	20	19:45			2	15	4	14	29
08:00			9		1			20:00			2		3		
08:15			11		4			20:15			1		2		
08:30			3		4			20:30			5		3		
08:45			5	28	2	11	39	20:45			5	13	4	12	25
09:00			4		0			21:00			2		4		
09:15			2		3			21:15			4		1		
09:30			4		2			21:30			2		2		
09:45			4	14	2	7	21	21:45			2	10	3	10	20
10:00			1		3			22:00			4		3		
10:15			1		2			22:15			4		1		
10:30			2		2			22:30			1		2		
10:45			2	6	3	10	16	22:45			0	9	0	6	15
11:00			7		2			23:00			1		1		
11:15			1		3			23:15			2		2		
11:30			1		2			23:30			1		1		
11:45			2	11	1	8	19	23:45			0	4	3	7	11
Total Vol.				82		54	**136**					183		196	**379**

Daily Totals

NB	SB	EB	WB	Combined
		265	250	**515**

	AM			PM		
Split %	60.3%	39.7%	**26.4%**	48.3%	51.7%	**73.6%**
Peak Hour	07:45	11:45	**07:45**	16:15	15:45	**16:00**
Volume	29	13	**39**	26	30	**53**
P.H.F.	0.66	0.65	**0.65**	0.81	0.83	**0.83**

Volumes for: Thursday, October 15, 2009 City: Irvine Project #: 09-1141-003

Location: Weeping Wood (W-leg) EB@ Heathergreen

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		0			12:00			1		5		
00:15			1		0			12:15			3		4		
00:30			0		0			12:30			6		3		
00:45			0	1	0	0	1	12:45			2	12	6	18	30
01:00			0		0			13:00			5		3		
01:15			1		0			13:15			4		5		
01:30			0		0			13:30			1		6		
01:45			1	2	0	0	2	13:45			0	10	2	16	26
02:00			0		0			14:00			4		4		
02:15			0		0			14:15			3		2		
02:30			0		0			14:30			1		2		
02:45			1	1	0	0	1	14:45			5	13	3	11	24
03:00			0		0			15:00			7		3		
03:15			0		0			15:15			5		2		
03:30			0		0			15:30			3		4		
03:45			0	0	0	0		15:45			4	19	7	16	35
04:00			0		0			16:00			2		3		
04:15			0		1			16:15			5		5		
04:30			0		0			16:30			2		2		
04:45			0	0	0	1	1	16:45			2	11	4	14	25
05:00			0		2			17:00			2		5		
05:15			0		1			17:15			2		6		
05:30			0		1			17:30			4		3		
05:45			1	1	1	5	6	17:45			2	10	5	19	29
06:00			1		2			18:00			2		4		
06:15			2		1			18:15			4		5		
06:30			2		1			18:30			3		3		
06:45			3	8	0	4	12	18:45			4	13	6	18	31
07:00			1		2			19:00			2		5		
07:15			4		3			19:15			2		4		
07:30			3		2			19:30			2		3		
07:45			6	14	1	8	22	19:45			1	7	4	16	23
08:00			5		1			20:00			0		3		
08:15			4		4			20:15			2		3		
08:30			4		2			20:30			2		3		
08:45			2	15	3	10	25	20:45			1	5	3	12	17
09:00			4		2			21:00			1		3		
09:15			6		3			21:15			3		5		
09:30			4		1			21:30			1		4		
09:45			3	17	2	8	25	21:45			1	6	2	14	20
10:00			2		1			22:00			5		3		
10:15			2		2			22:15			1		3		
10:30			2		1			22:30			1		2		
10:45			4	10	2	6	16	22:45			4	11	1	9	20
11:00			4		1			23:00			2		1		
11:15			1		1			23:15			1		1		
11:30			3		1			23:30			1		1		
11:45			4	12	0	3	15	23:45			3	7	0	3	10
Total Vol.				81		45	**126**					124		166	**290**

Daily Totals

NB	SB	EB	WB	Combined
		205	211	**416**

	AM			PM		
Split %	64.3%	35.7%	**30.3%**	42.8%	57.2%	**69.7%**
Peak Hour	07:45	11:45	**07:45**	14:45	12:45	**15:00**
Volume	19	12	**27**	20	20	**35**
P.H.F.	0.79	0.60	**0.84**	0.71	0.83	**0.80**

FOUR-WAY STOP WARRANTS

Major Street: **Weepingwood** CALC RG DATE 10/21/2009

Minor Street: **Heathergreen** CHK RK DATE 10/21/2009

CRITERIA SATISFIED FOR FOUR-WAY STOP CONTROL: NO

Any one of the following criteria may warrant four-way stop control:

A. TRAFFIC SIGNAL WARRANTED — SATISFIED = NO

Urgent need for a four-way stop as an interim measure **NO**

B. ACCIDENTS — SATISFIED = NO

Number of Correctable Accidents **0** (5 or more in a 12-month period)

C. MINIMUM VOLUMES — SATISFIED = NO

1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and — SATISFIED = **NO**; Total Volume = **29**

2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but — SATISFIED = **NO**; Minor Volume = **12**

3. If the 85th-percentile approach speed of the major-street traffic exceeds 65 km/h or exceeds 40 mph, the mimimum vehicular volume warrants are 70% of the above values. — SATISFIED = **NO**; Critical Speed = **24**

Combined average vehicle volume exceeds 210 (300 * 70%) — SATISFIED = **NO**

Combined average minor volume exceeds 140 (200 * 70%) — SATISFIED = **NO**

Peak Hour Period		Hr 1	Hr 2	Hr 3	Hr 4	Hr 5	Hr 6	Hr 7	Hr 8	TOTAL	AVG.
		7-8	8-9	11-12	12-1	1-2	2-3	4-5	6-7	VOL.	VOL.
Major Street	Vehicles	23	26	20	30	35	30	39	30	233	29
Minor Street	Vehicles	14	15	10	12	8	8	11	15	93	12
	Pedestrians	0	0	0	0	0	0	0	0	0	0
	Subtotal	14	15	10	12	8	8	11	15	93	12
				TOTAL AVERAGE HOURLY VOLUME							41

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80% of the minimum values. Criterion C.3 is excluded from this condition. — SATISFIED = NO

Number of correctable accidents exceeds 4 (5 * 80%) — SATISFIED = **NO**

Combined average vehicle volume exceeds 240 (300 * 80%) — SATISFIED = **NO**

Combined average minor volume exceeds 160 (200 * 80%) — SATISFIED = **NO**

OPTION:

Other criteria that may be considered include:

E. The need to control left-turn conflicts — **NO**

F. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes; — **NO**

G. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and — **NO**

H. An intersection of two residential neighborhod collector (through) streets of similar design and operating characteristics where multiway stop control would improve traffic operational characteristics of the intersection. — **NO**

HOURLY TRAFFIC COUNTS
HEATHERGREEN @ WEEPINGWOOD

END TIME		NB	SB	SUBTOTAL		EB	WB	SUBTOTAL		GRAND
				NB + SB				EB + WB		TOTAL
1			0	0		1	0	1		1
2			0	0		2	0	2		2
3			1	1		1	0	1		2
4			0	0		0	0	0		0
5			3	3		0	0	0		3
6			3	3		1	5	6		9
7			0	0		8	4	12		12
8			14	14		14	9	23		37
9			15	15		15	11	26		41
10			6	6		17	7	24		30
11			7	7		10	10	20		27
12 NOON			10	10		12	8	20		30
1			12	12		12	18	30		42
2			8	8		10	25	35		43
3			8	8		13	17	30		38
4			7	7		19	24	43		50
5			11	11		11	28	39		50
6			8	8		10	18	28		36
7			15	15		13	17	30		45
8			8	8		7	14	21		29
9			5	5		5	12	17		22
10			8	8		6	10	16		24
11			8	8		11	6	17		25
12			2	2		7	7	14		16
TOTAL		0	159	159		205	250	455		614

Appendix D

Orange County Fire Authority Guidelines

ATTACHMENT 8

Fire Lane Parking Violations

The California Fire Code (CFC) and California Vehicle Code (CVC) specify rules of the road for stopping, standing, and parking in fire lanes or near fire hydrants.

A. Section 22500.1 states that no person shall stop, park, or leave standing any vehicle whether attended or unattended, in any location designated as a fire lane by the Fire Authority except when necessary to avoid conflict with other traffic or in compliance with the direction of a peace officer or official traffic control device. Vehicles illegally parked in a fire lane may be towed per CVC 22953(b).

B. There shall be no parking of any vehicles other than fire department vehicles within 15 feet of either side of a fire hydrant in accordance with CVC 22514(c). Such vehicles may be towed per CVC 22651(e).

C. CVC 22658(a) permits the owner or person in lawful possession of any private property, subsequent to notifying local law enforcement, to cause the removal of a vehicle parked on such property to the nearest public garage, if:

1) A sign is displayed in plain view at all entrances to the property specifying:

a) The ordinance prohibiting public parking, *and*

b) A notation indicating that vehicles will be removed at the owner's expense, *and*

c) The telephone number of the local traffic law enforcement agency, *or*

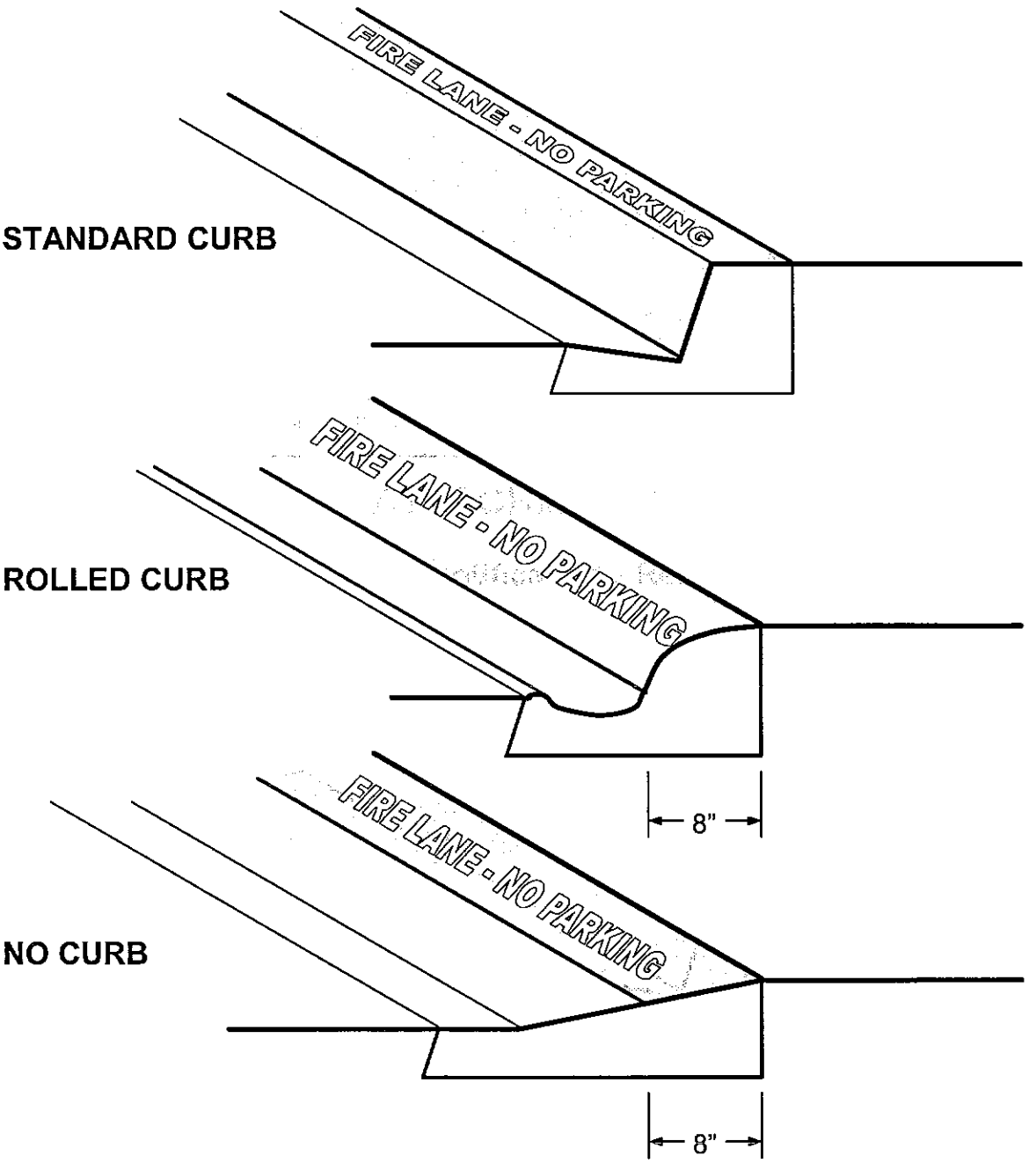
2) The lot or parcel upon which the vehicle is parked has a single-family dwelling.

D. CFC 503.4 states that the required width of a fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances shall be maintained at all times.

E. CFC 508.5.4 states that vehicles and other obstructions shall not be placed or kept near fire hydrants, fire department inlet connections or fire-protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately discernible. The fire department shall not be deterred or hindered from gaining immediate access to fire-protection equipment or hydrants.

ATTACHMENT 9

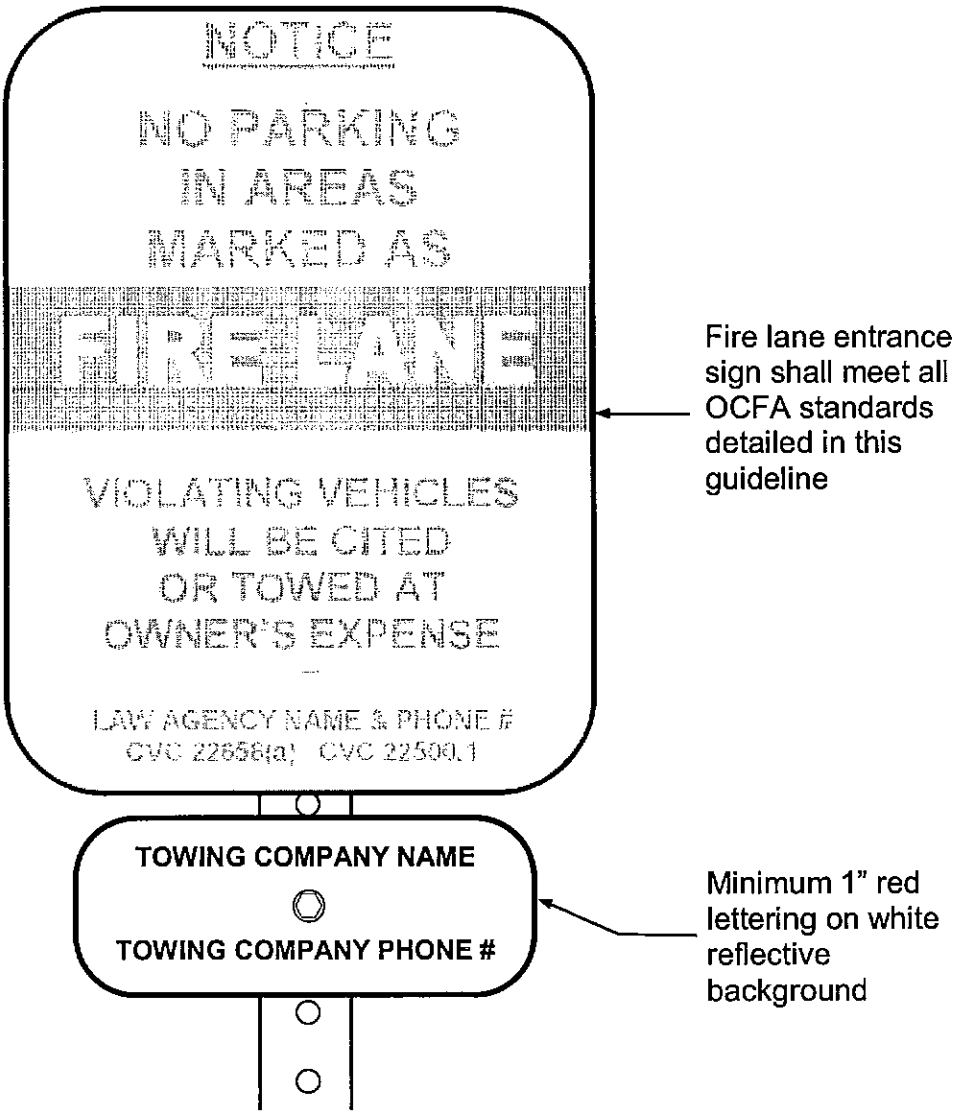
Fire Lane Identification – Red Curbs



1. Fire lane entrance sign(s) shall also be provided per Attachment 10 or 11.
2. Curbs shall be painted OSHA safety red.
3. "FIRE LANE – NO PARKING" shall be painted on top of curb in 3" white lettering at a spacing of 30' on center or portion thereof.

ATTACHMENT 11

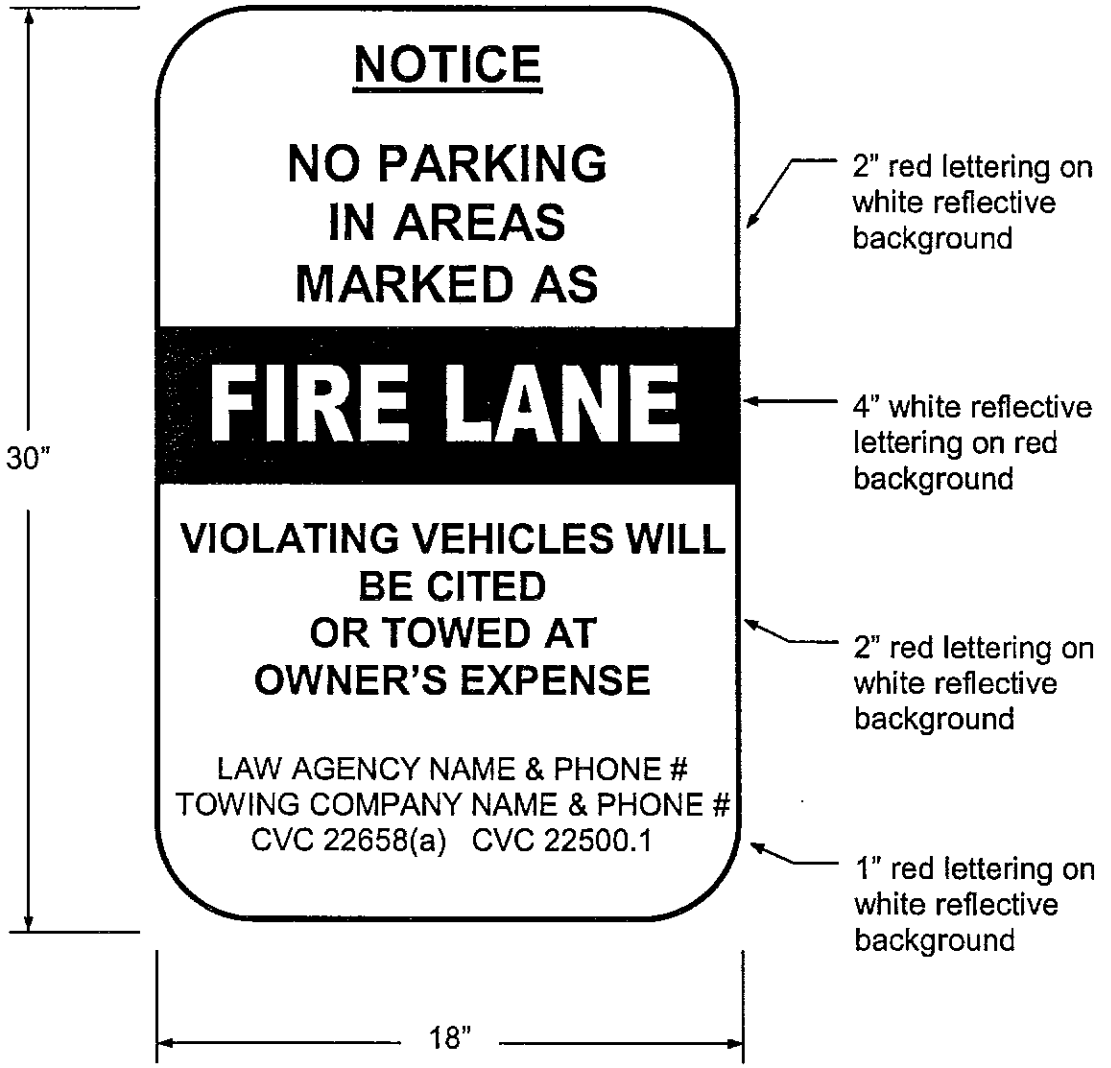
Specifications for Alternate Location of Towing Company Information



To facilitate periodic changes in towing company contracts, the towing company contact information may be posted on a separate sign mounted directly below the fire lane entrance sign instead of on the entrance sign itself. The method of attachment to the post shall not obscure the wording on either sign.

ATTACHMENT 10

Specifications for
Fire Lane Entrance Signs
To be used only at *vehicle entry points*
to areas that contain "Fire Lane—No Parking" signs or red curbs



All sign and lettering dimensions shown are minimums.

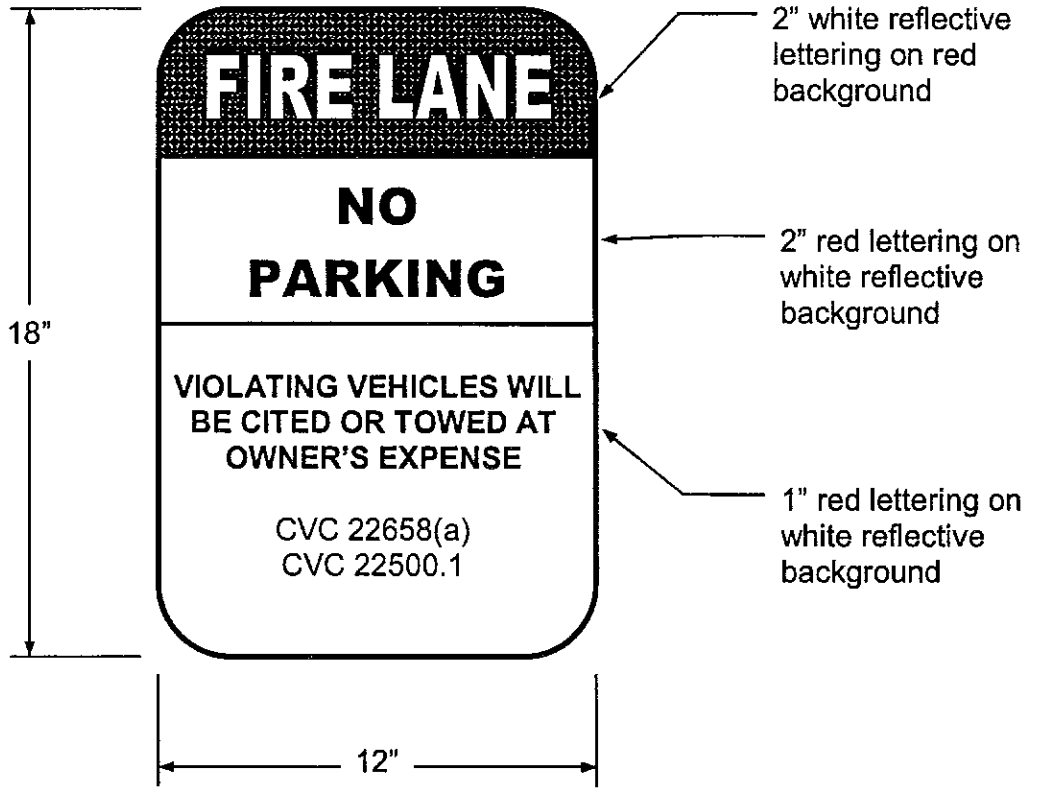
This sign shall be posted at all vehicle entrances to areas marked with either red curbs or fire lane "No Parking" signs.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachment 13.

Towing company contact information is required for all properties with a standing written agreement for services with a towing company per the California Vehicle Code.

ATTACHMENT 12

Specifications for Fire Lane No Parking Signs

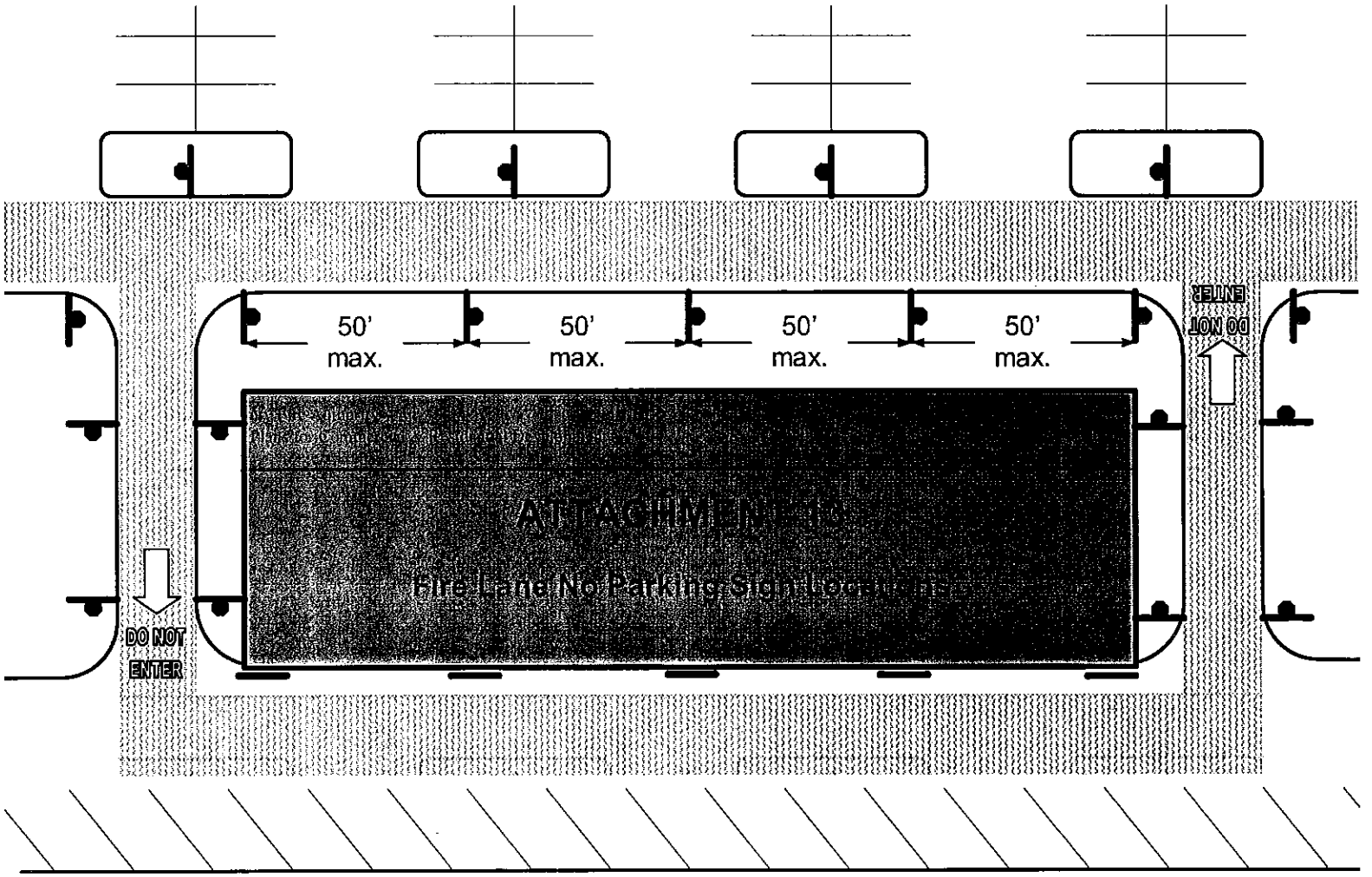


All sign and lettering dimensions shown are minimums.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachment 14.

ATTACHMENT 13

Fire Lane No Parking Sign Locations



Fire Lane

Fire Lane Sign (post mounted)

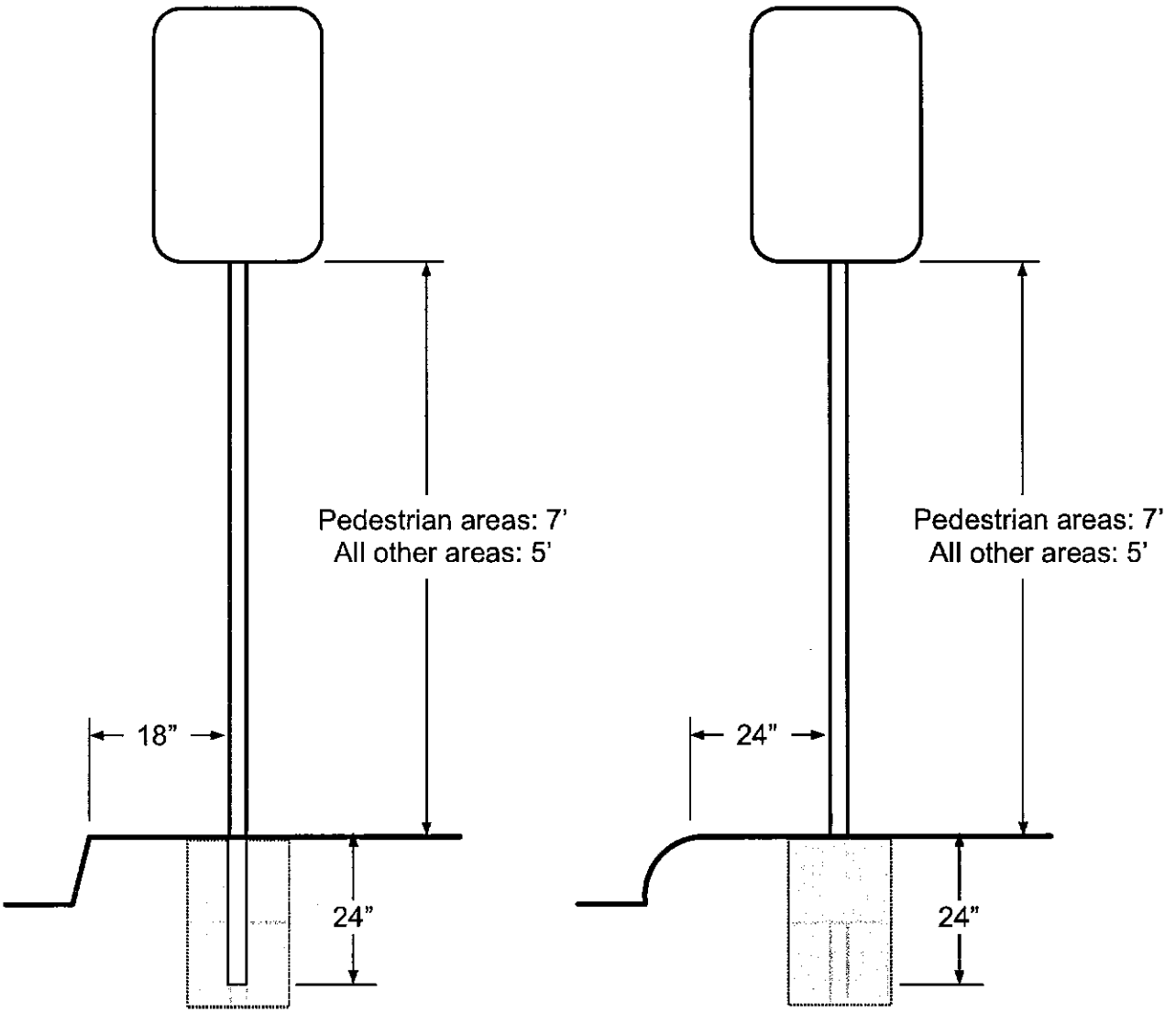
Fire Lane Sign (wall mounted)

Signs are required within 3' of the end of each designated fire lane and spaced a maximum of 50' along the entire designated lane. One sign is required for each island adjacent to the fire lane.

Signs shall be securely mounted facing the direction of travel and clearly visible to oncoming traffic entering the designated area. Signs shall be made of durable material and installed per Attachment 14. Where sign posts are not practical, signs may be mounted on a wall or fence. OCFA inspectors will determine if additional signs or sign locations are required.

ATTACHMENT 14

Mounting Specifications for Fire Lane Entrance and No Parking Signs



STANDARD CURB **ROLLED CURB**

Signs shall be mounted facing the direction of vehicular travel.

Signs may be mounted on existing posts or buildings where the centerline of the sign is no more than 24" from the edge of the roadway.

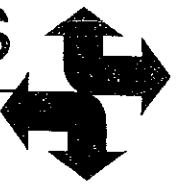
Depth of bury shall be a *minimum* of 24".

Appendix E

California Manual on Uniform Traffic Control Devices
References

Manual on Uniform Traffic Control Devices

Millennium Edition



Part 2
Signs

– ALL-WAY STOPS

U.S. Department of Transportation
Federal Highway Administration

ATSSA
SAFER ROADS SAVE LIVES

AASHTO

ite

Where there is a marked crosswalk at the intersection, the STOP sign should be installed in advance of the crosswalk line nearest to the approaching traffic.

Option:

At wide-throat intersections or where two or more approach lanes of traffic exist on the signed approach, observance of the stop control may be improved by the installation of an additional STOP sign on the left side of the road and/or the use of a stop line. At channelized intersections, the additional STOP sign may be effectively placed on a channelizing island.

Support:

Figure 2A-2 shows some typical placements of STOP signs.

Section 2B.07 Multiway Stop Applications

Support:

Multiway stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multiway stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multiway stop control is used where the volume of traffic on the intersecting roads is approximately equal.

The restrictions on the use of STOP signs described in Section 2B.05 also apply to multiway stop applications.

Guidance:

The decision to install multiway stop control should be based on an engineering study.

The following criteria should be considered in the engineering study for a multiway STOP sign installation:

A. Where traffic control signals are justified, the multiway stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

B. A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right- and left-turn collisions as well as right-angle collisions.

C. Minimum volumes:

1. The vehicular volume entering the intersection from the major street

approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and

2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but

3. If the 85th-percentile approach speed of the major-street traffic exceeds 65 km/h (40 mph), the minimum vehicular volume warrants are 70 percent of the above values.

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Option:

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;

B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to safely negotiate the intersection unless conflicting cross traffic is also required to stop; and

D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multiway stop control would improve traffic operational characteristics of the intersection.

Section 2B.08 YIELD Sign (R1-2)

Standard:

The YIELD (R1-2) sign shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.

Support:

The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down or stop when necessary to avoid interfering with conflicting traffic.

Appendix F

Design Standards

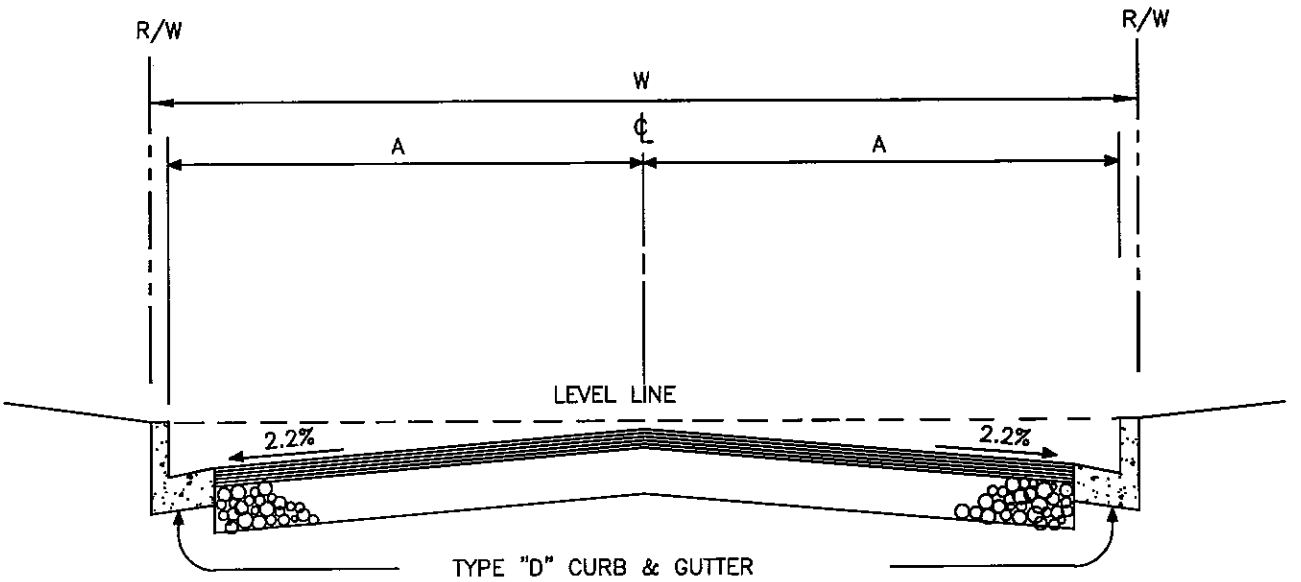
RESIDENTIAL	ONE SIDE	ONE SIDE	14'&20'	-.07'&.06'
RESIDENTIAL	BOTH SIDES	BOTH SIDES	20'	.06
RESIDENTIAL	BOTH SIDES	ONE SIDE	16'&20'	-.03'&.06'
RESIDENTIAL	BOTH SIDES	NONE	16'	-.03'

LOCAL STREETS THAT EXCEED 1000' IN LENGTH SHALL BE CONSIDERED A LOCAL COLLECTOR.

* MIXED-USE IS DEFINED AS BOTH INDUSTRIAL OR COMMERCIAL WITH RESIDENTIAL.

NOTES:

1. "W" IS MEASURED FROM RIGHT-OF-WAY TO RIGHT-OF-WAY.
2. SEE STANDARD PLAN No. 200 FOR CURB AND GUTTER DETAIL.
3. SEE STANDARD PLAN No. 201 AND 201A FOR SIDEWALK REQUIREMENTS AND DETAIL.
4. STRUCTURAL SECTION TO BE DETERMINED BY SOILS TEST AND APPROVED BY THE CITY ENGINEER. MINIMUM SECTION SHALL BE 0.25 FEET A.C. OVER 0.50 FEET A.B. FOR STREETS USING ONE LIFT OF 1/2 INCH DIAMETER AGGREGATE AND PG 64-10 A.C., OR 0.35 FEET A.C. OVER 0.5 FEET A.B. FOR STREETS USING BASE COURSE OF 0.25 FEET A.C. WITH A FINISH COURSE OF 0.1 FEET A.C. THE FINAL LIFT SHALL CONSIST OF 1/2 INCH DIAMETER AGGREGATE AND PG 64-10 A.C. ALL LIFTS EXCEPT THE FINAL LIFT SHALL CONSIST OF 3/4 INCH DIAMETER AGGREGATE PG 64-10 A.C.
5. MINIMUM 8 FEET PARKWAY SHALL BE PROVIDED FOR SIDEWALK AND PUBLIC UTILITY USE.
6. TRANSITIONS IN "A" WILL BE REQUIRED TO HAVE 25 FOOT REVERSE CURVES OR 40:1 TAPERS.
7. FINISHED SURFACE OF PAVEMENT SHALL BE 3/8 INCH ABOVE LIP OF PARKWAY GUTTER.
8. EACH PARALLEL PARKING SPACE SHALL HAVE A MINIMUM DIMENSION OF 8 FEET WIDE BY 22 FEET LONG. AND SHALL BE IN ACCORDANCE WITH ZONING ORDINANCE SECTION 4-4-1 A.5.



DESIGN SPEED: 25 MPH
CENTERLINE CURVE RADIUS: 300 FEET MINIMUM (SOURCE CALTRANS DESIGN MANUAL)
ADT VOLUME: 200–1200

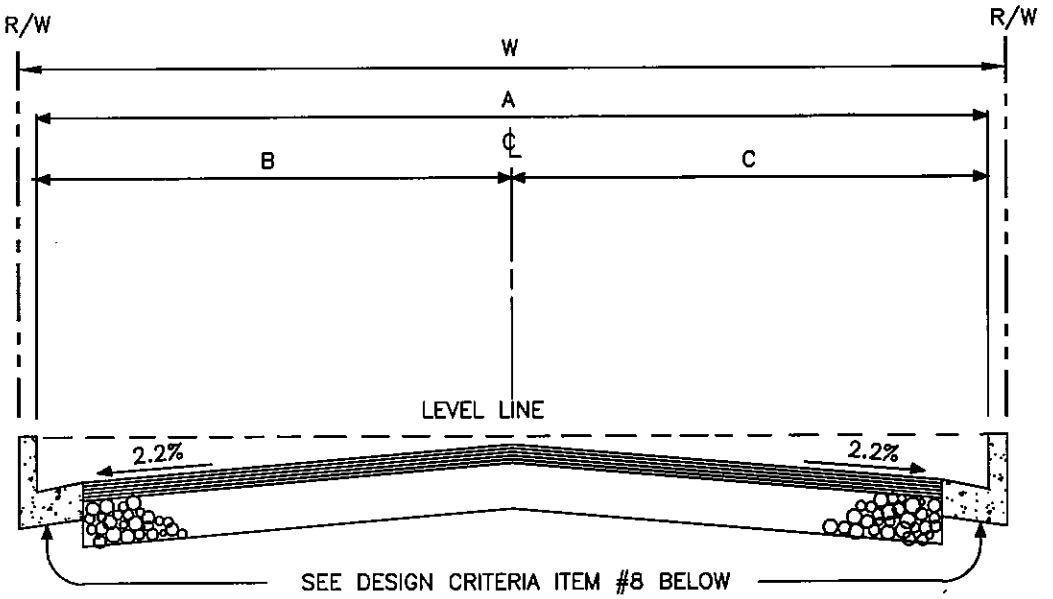
TYPE	ACCESS ALLOWED	PARKING	A	DISTANCE FROM LEVEL LINE TO FINISHED SURFACE AT ℄
INDUSTRIAL/COMMERCIAL	BOTH SIDES	BOTH SIDES	22'	.10'
INDUSTRIAL/COMMERCIAL	BOTH SIDES	NOT ALLOWED	20'	.06'
MIXED–USE	BOTH SIDES	BOTH SIDES	20'	.06'
RESIDENTIAL	ONE SIDE	ONE SIDE	12'&18'	–.12'&.02'
RESIDENTIAL	BOTH SIDES	BOTH SIDES	18'	.02'
RESIDENTIAL	BOTH SIDES	ONE SIDE	14'&18'	–.07'&.02'
RESIDENTIAL	BOTH SIDES	NONE	14'	–.07'

* MIXED–USE IS DEFINED AS BOTH INDUSTRIAL OR COMMERCIAL WITH RESIDENTIAL.

NOTES:

1. "W" IS MEASURED FROM BACK OF CURB TO BACK OF CURB. (PUBLIC STREETS SHALL INCLUDE PARKWAY WIDTH REQUIREMENTS)
2. SEE STANDARD PLAN No. 200 FOR CURB AND GUTTER DETAIL.
3. SEE STANDARD PLAN No. 201 AND 201A FOR SIDEWALK REQUIREMENTS AND DETAIL.
4. STRUCTURAL SECTION TO BE DETERMINED BY SOILS TEST AND APPROVED BY THE CITY ENGINEER. MINIMUM SECTION SHALL BE 0.25 FEET A.C. OVER 0.50 FEET A.B. FOR STREETS USING ONE LIFT OF 1/2 INCH DIAMETER AGGREGATE AND PG 64–10 A.C., OR 0.35 FEET A.C. OVER 0.5 FEET A.B. FOR STREETS USING BASE COURSE OF 0.25 FEET A.C. WITH A FINISH COURSE OF 0.1 FEET A.C. THE FINAL LIFT SHALL CONSIST OF 1/2 INCH DIAMETER AGGREGATE AND PG 64–10 A.C. ALL LIFTS EXCEPT THE FINAL LIFT SHALL CONSIST OF 3/4 INCH DIAMETER AGGREGATE PG 64–10 A.C.
5. FOR STREETS 1000 FEET OR MORE, SEE STANDARD PLAN 104A.
6. UTILITY AND SIDEWALK EASEMENTS WILL BE REQUIRED ON EACH SIDE OF STREET UNLESS OTHERWISED APPROVED BY THE CITY ENGINEER.
7. TRANSITIONS IN "A" WILL BE REQUIRED TO HAVE 25 FOOT REVERSE CURVES OR 40:1 TAPERS.
8. FINISHED SURFACE OF PAVEMENT SHALL BE 3/8 INCH ABOVE LIP OF PARKWAY GUTTER.
9. EACH PARALLEL PARKING SPACE SHALL HAVE A MINIMUM DIMENSION OF 8 FEET WIDE BY 22 FEET LONG. AND SHALL BE IN ACCORDANCE WITH ZONING ORDINANCE SECTION 4–4–1 A.5.

REVISIONS	CITY OF IRVINE	STANDARD PLAN No.
	LOCAL STREETS	104
	Approved by: Mark L. Carroll R.C.E. 31515 City Engineer — Date: 03–19–2009	Sheet 1 of 1



ACCESS ALLOWED	PARKING	A	B	C
ONE SIDE	NONE	24'	12'	12'
ONE SIDE	ONE SIDE	30'	12'	18'
ONE SIDE	BOTH SIDES	36'	18'	18'
BOTH SIDES	NONE	26'	13'	13'
BOTH SIDES	ONE SIDE	32'	14'	18'
BOTH SIDES	BOTH SIDES	36'	18'	18'

DESIGN CRITERIA

1. THE DESIGN SPEED SHALL BE 20 MPH.
2. A MINIMUM DISTANCE OF 90 FEET SHALL BE PROVIDED BETWEEN THE CENTERLINES OF PRIVATE WAYS.
3. "W" IS MEASURED FROM BACK OF CURB TO BACK OF CURB.
4. THE MINIMUM WIDTH OF "A" SHALL BE 28 FEET IN VERY HIGH FIRE HAZARD SEVERITY ZONES.
5. SEE STANDARD PLAN No. 201 FOR SIDEWALK REQUIREMENTS AND DETAIL.
6. STRUCTURAL SECTION TO BE DETERMINED BY SOILS TEST AND APPROVED BY THE CITY ENGINEER. MINIMUM SECTION SHALL BE 0.25 FEET A.C. OVER 0.50 FEET A.B. FOR STREETS USING ONE LIFT OF 1/2 INCH DIAMETER AR4000 MEDIUM A.C., OR 0.35 FEET A.C. OVER 0.5 FEET A.B. FOR STREETS USING BASE COURSE OF 0.25 FEET A.C. WITH A FINISH COURSE OF 0.1 FEET A.C. THE FINAL LIFT SHALL CONSIST OF 1/2 INCH DIAMETER AR4000 MEDIUM. ALL LIFTS EXCEPT THE FINAL LIFT SHALL CONSIST OF 3/4 INCH DIAMETER AR4000 A.C.
7. THE MINIMUM GRADE SHALL BE 1.0% AT THE CENTERLINE UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
8. SEE STANDARD PLAN NUMBER 200 AND 200A FOR CURB AND GUTTER DETAIL.
9. THE MAXIMUM DEAD-END LENGTH WITH TURN-AROUND SHALL BE 1000 FEET MEASURED FROM THE CENTERLINE OF AN INTERSECTING PRIVATE WAY OR STREET.

REVISIONS	CITY OF IRVINE	STANDARD PLAN No.
	PRIVATE WAY	111
	Approved by: Mark L. Carroll R.C.E. 31515 City Engineer — Date: 03-19-2009	Sheet 1 of 2

DEFINITION

A Private Way is a low - speed roadway for general circulation in residential neighborhoods to access residential units, garages and parking areas. The maximum Average Daily Traffic on a Private Way shall not exceed 850 trips.

NOTES

1. When the Average Daily Traffic on the Private Way exceeds 850 trips the entire Private Way shall be designated a Private Local Street and shall be designed in accordance with City Standard Plan 104 for Residential Local Streets.
2. The latest Irvine Transportation Analysis Model (ITAM) shall be used in determining Average Daily Traffic on a Private Way.
3. The width of the roadway with curb and gutter shall be measured in accordance with Standard Plan 200 and 200A.
4. The width of a roadway which lacks curb and gutter shall be measured from the edge of pavement.
5. An easement for sidewalk purposes shall be dedicated to the Home Owners Association on the Private Way in areas where on street parking is proposed and in areas required to maintain continuity in the pedestrian circulation network.
6. Driveways serving one residential unit shall be constructed in conformance with Standard Plan 204 or 205 (TYPE II-B).
7. Driveways serving a Private Court shall be constructed in conformance with Standard Plan 204 or 205 (TYPE II-B).
8. All pedestrian access locations shall conform to the latest Title 24 and Americans with Disabilities Act (ADA) requirements.
9. When a Private Way intersects with a Private or Public Street no parking shall be permitted within 20' of ECR or BCR on the Private Way.
10. No landscaping or structures within the limited use area shall exceed 30 inches in height above the adjacent top of curb (see Standard Plan 403 for determination of limited use area).
11. Toe of slopes shall not encroach into the limited use area.
12. Private Way to Private Way or Local Street intersection shall have a minimum radius of 20 feet.

REVISIONS	CITY OF IRVINE	STANDARD PLAN No.
	PRIVATE WAY	111
	Approved by Mark L. Carroll R.C.E. No. 31515 City Engineer — Date: 03-19-2009	Sheet 2 of 2

Appendix G

Traffic Calming Discussion

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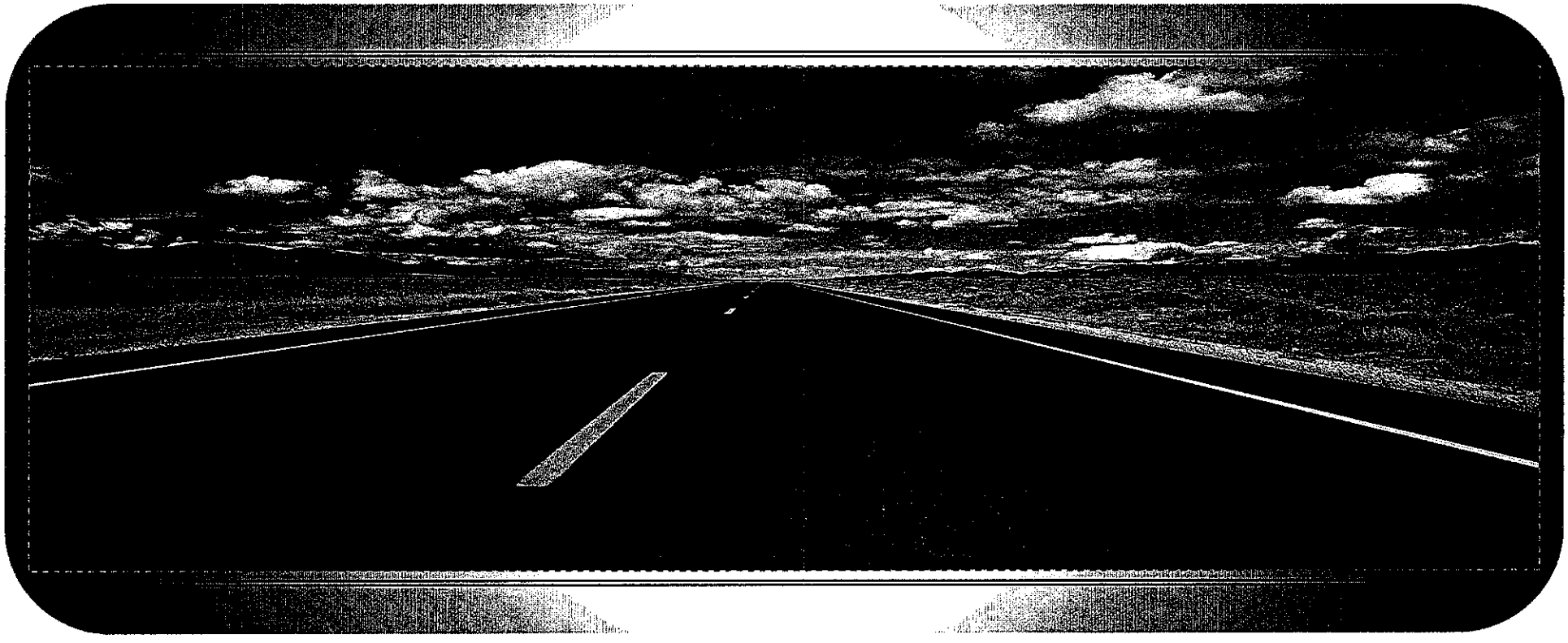
Community Traffic Calming Overview



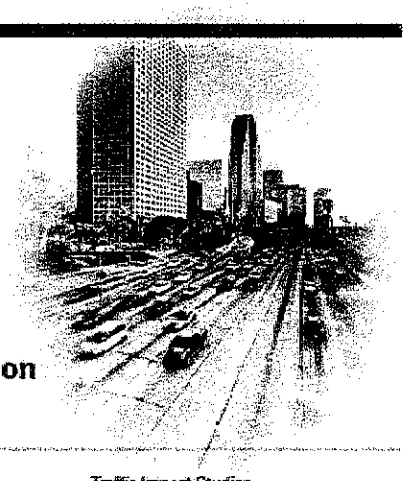
RK Engineering Group, Inc.
Tel: 949.474.0809
www.rkengineer.com

RK engineering group, inc.

Quality Transportation Solutions

Why Choose RK?

- Innovation
- Experience
- Reputation
- Expertise
- Creativity
- Client Satisfaction



RK Solutions

Transportation Planning

- Traffic Impact Studies
- Transportation Planning
- Transportation Demand Management
- Homeowner Association Traffic Review
- Parking Demand Studies
- Engineering and Speed Surveys
- Traffic Calming

Traffic Engineering & Design

- Traffic Signal & Signing/ Striping Plans
- Traffic Control Plans
- Traffic Engineering Studies
- Parking Lot Layouts
- Traffic Calming Design
- Traffic Signal Coordination Analysis
- Safe Routes to School

Environmental Engineering

- Noise and Air Quality Studies
- Sound Barrier Analysis
- General Plan Noise & Air Quality Elements
- Noise Ordinance Compliance
- Room to Room Acoustical Analysis
- Noise and Air Monitoring/ Analysis

Contact

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P.E. Principal

Thomas Wheat
P.E. Vice President

Rogier Goedecke
Vice President, Operations

3991 Macarthur Boulevard,
Suite 310
Newport Beach, CA 92660
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http://www.rkengineer.com

"Traffic Calming is a system of design and management strategies that aims to balance traffic on streets with other uses. It is founded on the idea that people should be able to walk, meet, play, shop and even work alongside cars- but not be dominated by them."

RK engineering group, inc.

RK engineering group, inc.

Presentation Outline

- Benefits of Traffic Calming
- Common Misconceptions
- The RK Traffic Calming Toolbox

RK engineering group, inc.

Benefits of Traffic Calming

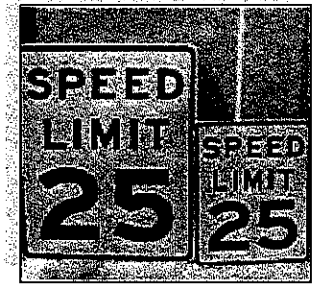
"Motor vehicle crashes are the leading cause of death for children aged 3-14." [17% of these fatalities involve pedestrians and another 16% involve pedal cyclists.]

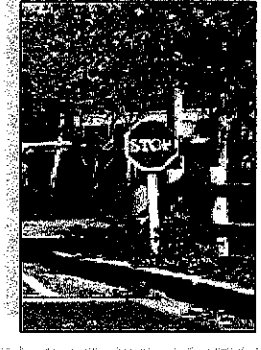
-National Center for Statistics and Analysis, 2005

- Increase Safety
- Reduce High Speeds in Neighborhoods
- Minimize Cut-Through Traffic
- Enhance the Aesthetic Look of the Neighborhood
- Reduce Noise Levels

Common Misconceptions

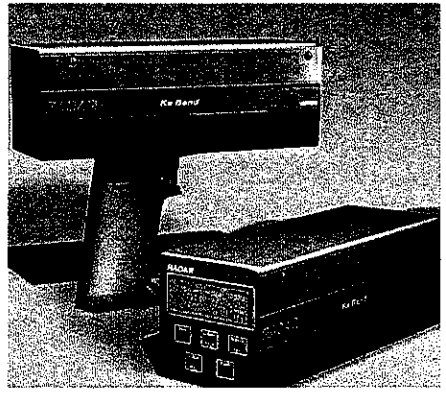
- Speed Limits and Speed Limit Signs
- Implementation of Stop Signs
- Installation of Speed Bumps
- Installation of Crosswalks
- Architectural Decor





Speed Limits

- Methods:
  - Radar
  - Pneumatic Tube



- Speed Percentiles:
  - 50th Percentile Speed
  - 85th Percentile Speed

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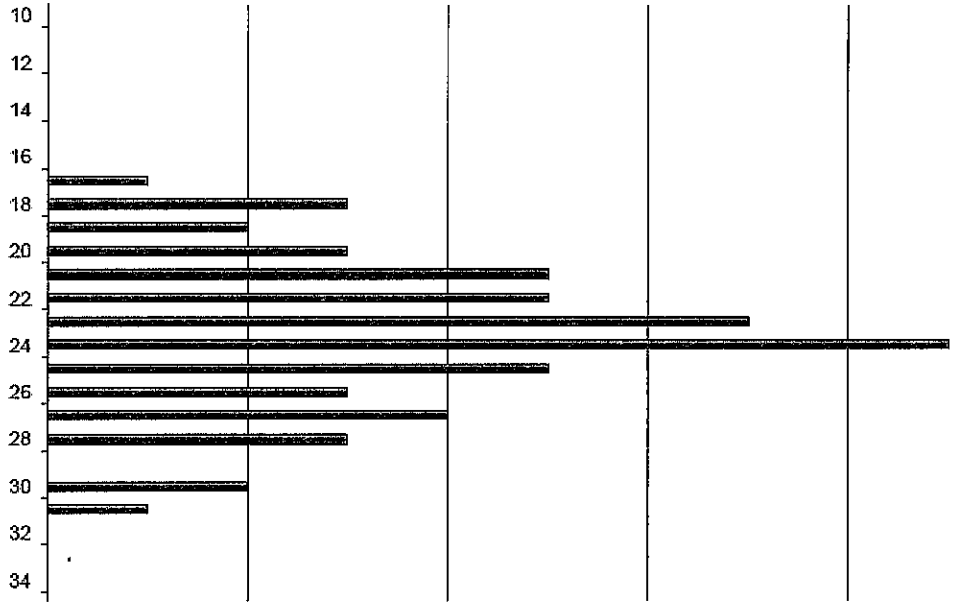
Speed Limits

Speed mph	ALL Vehicles
<=10	
11	
12	
13	
14	
15	
16	
17	1
18	3
19	2
20	3
21	5
22	5
23	7
24	9
25	5
26	3
27	4
28	3
29	
30	2
31	1
32	
33	
34	

North/South Spot Speeds



SPEED PARAMETERS										
Class	Count	Average Speed	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	# / % Below Pace	# / % Above Pace
ALL	53	23.5	17 - 31	24 mph	27 mph	18 - 27	46	87%	1% / 1	12% / 6

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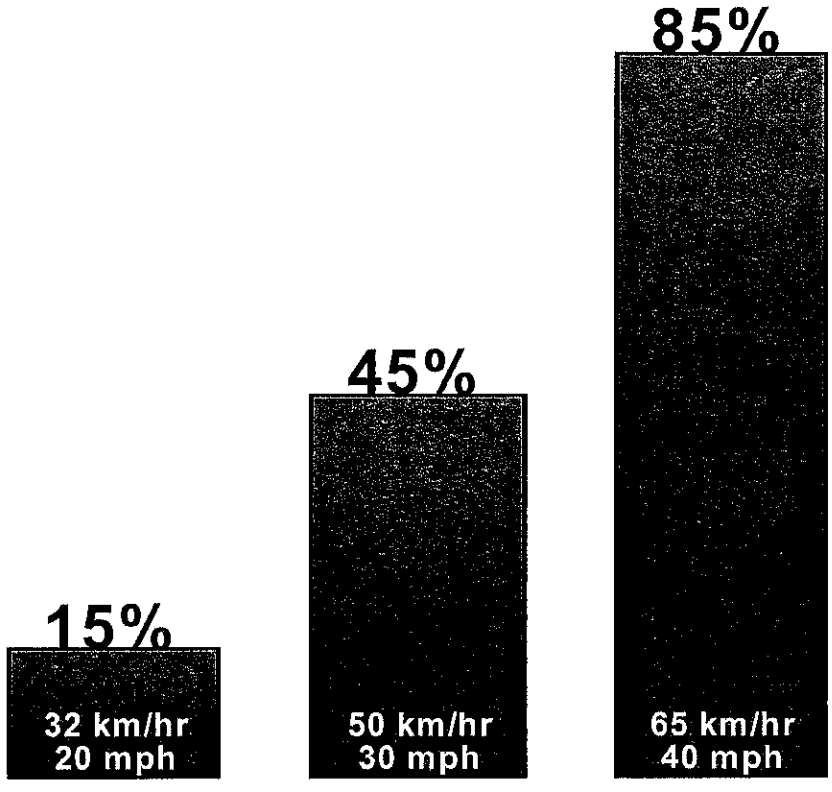
Pedestrian Probability of Death if Hit by Car



RK Traffic Calming Toolbox

RK engineering group, inc.

CVC Enforcement

- Application proceedings for California Vehicle Code (CVC) enforcement.
- Manual on Uniform Traffic Control Devices (MUTCD) compliance
- What the community gets out of CVC Enforcement

RK engineering group, inc.

Speed Bumps

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Speed Humps

"Speed humps were associated with significantly lower odds of children being injured in their neighborhood and being struck on the block immediately in front of their home."

-American Journal of Public Health | April 2004, Vol 94, No. 4

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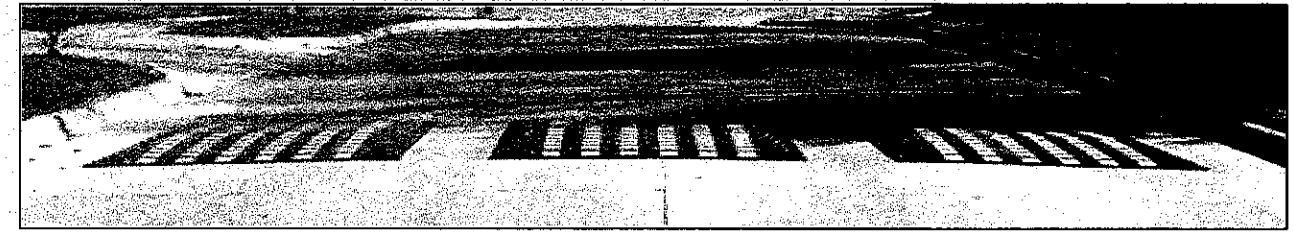

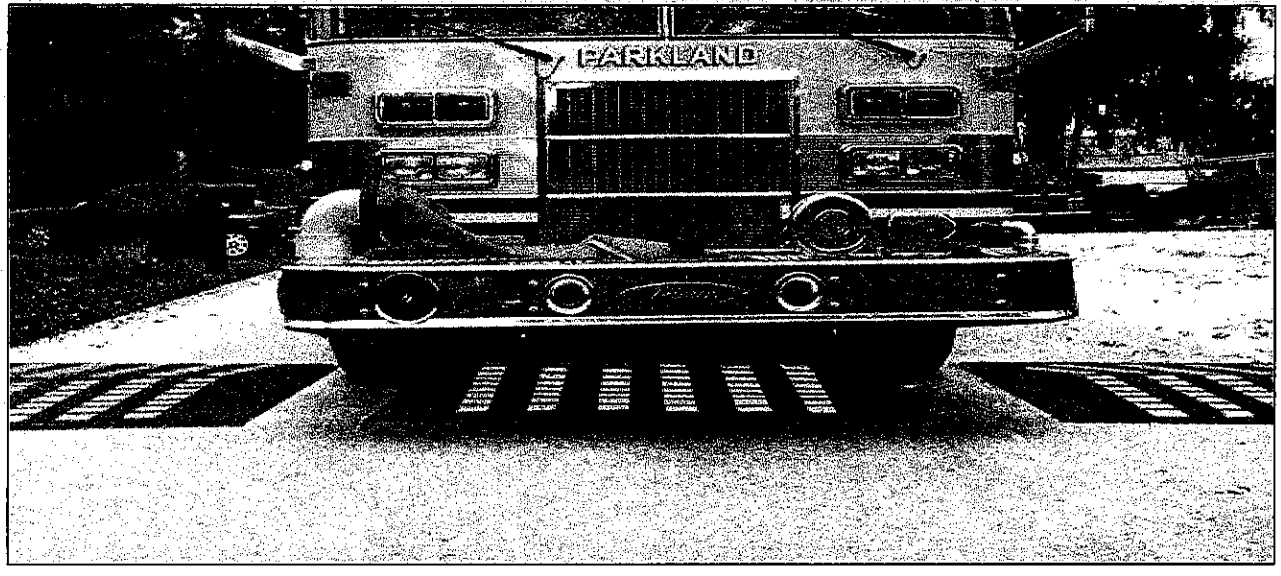

Speed Cushions

Speed Hump / Speed Cushion Impacts

Speed Impacts

Device	Change in Speed
12' Speed Hump	-22%
14' Speed Hump	-23%
22' Speed Table	-18%

Safety Impacts

Device	Change in Collisions
12' Speed Hump	-11%
14' Speed Hump	-41%
22' Speed Table	-45%

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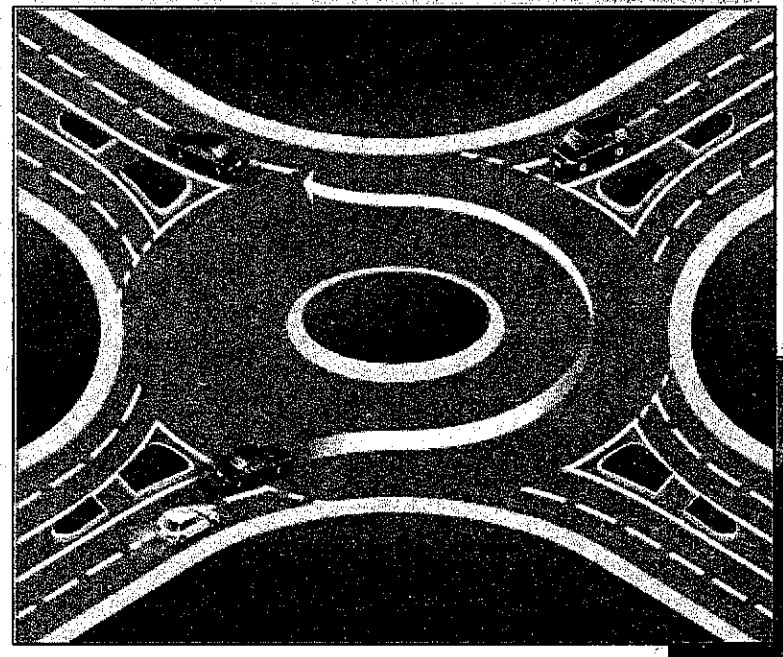
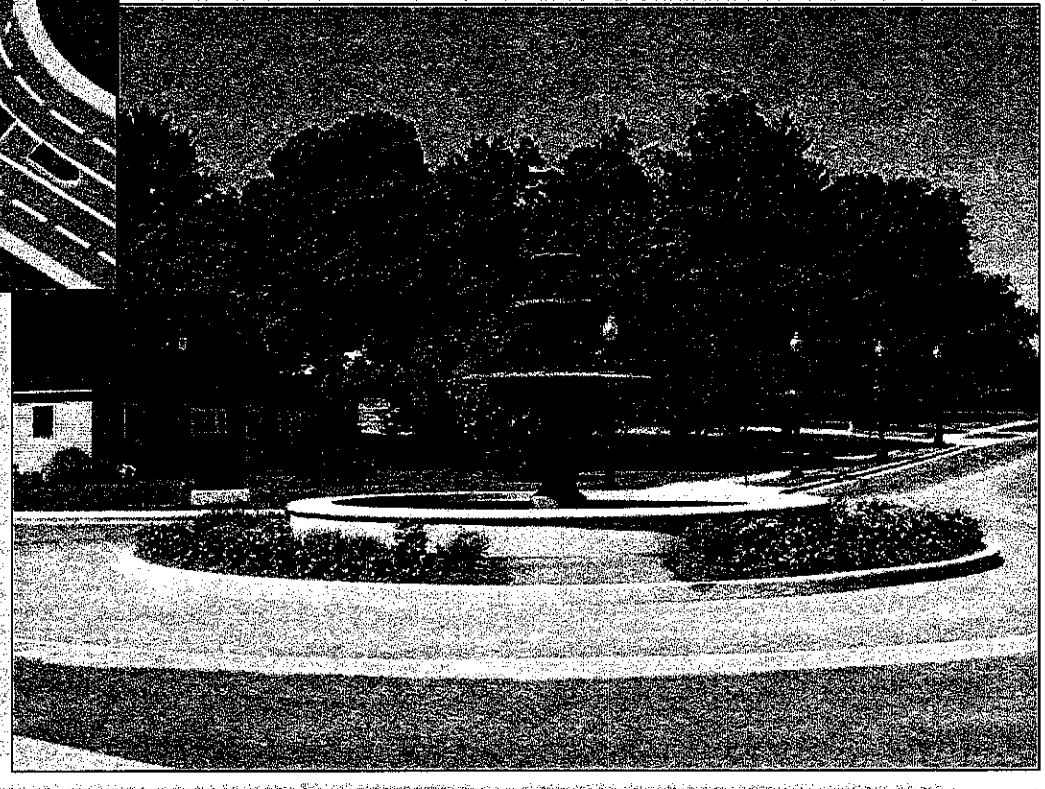


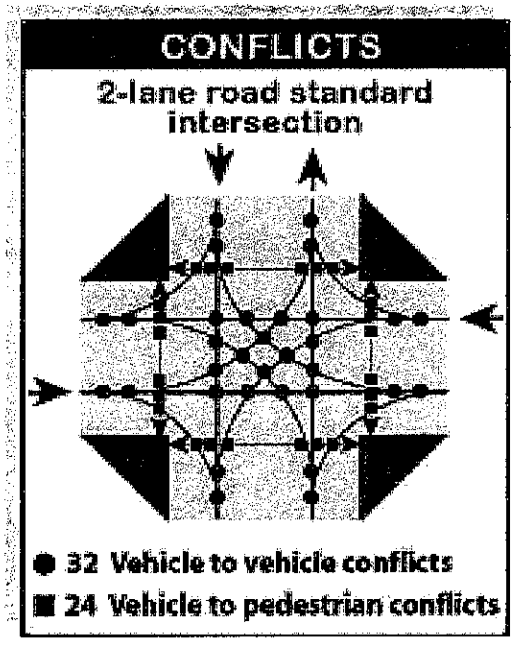
Modern Roundabouts

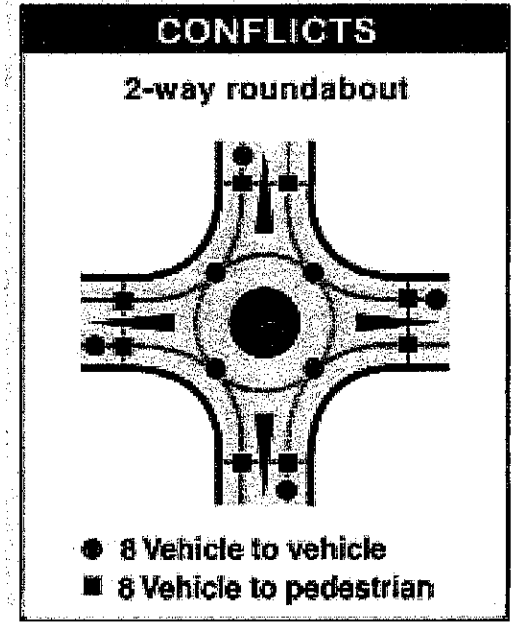


Modern Roundabouts' Impacts

Device	Change in Speed
Modern Roundabout	-11%

Device	Change in Collisions
Modern Roundabout	-73%





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Street Narrowing (Before)

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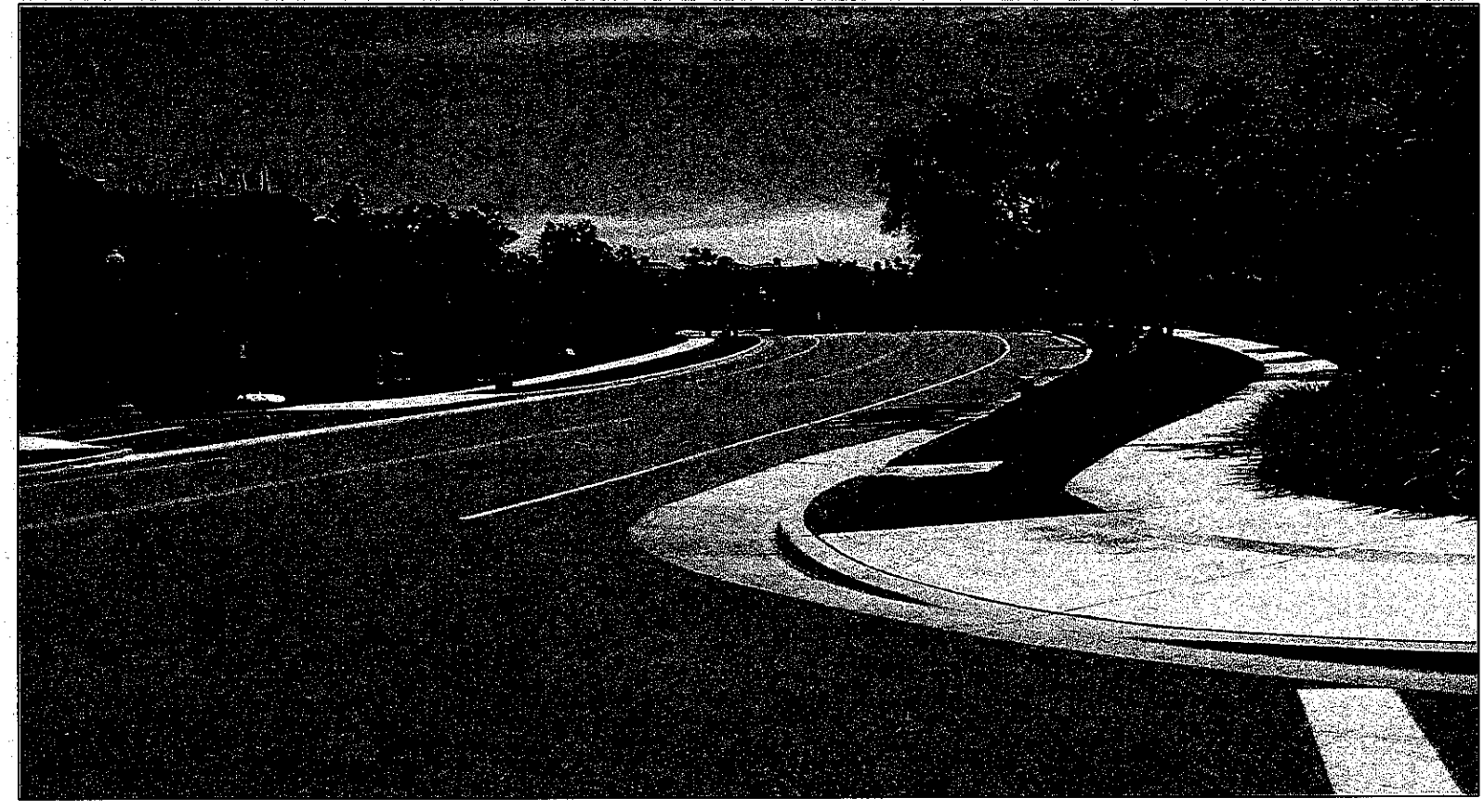
Street Narrowing (After)



Street Narrowing Impacts

Segment	85th % Speed (Before)	85th % Speed (After)	Change in Speed
Chambord (North of Rivage)	46 mph	37 mph	**-19.6%**
Chambord (South of Musset)	47 mph	39 mph	**-17%**
Chambord (South of Bargemon)	45 mph	39 mph	**-13.3%**

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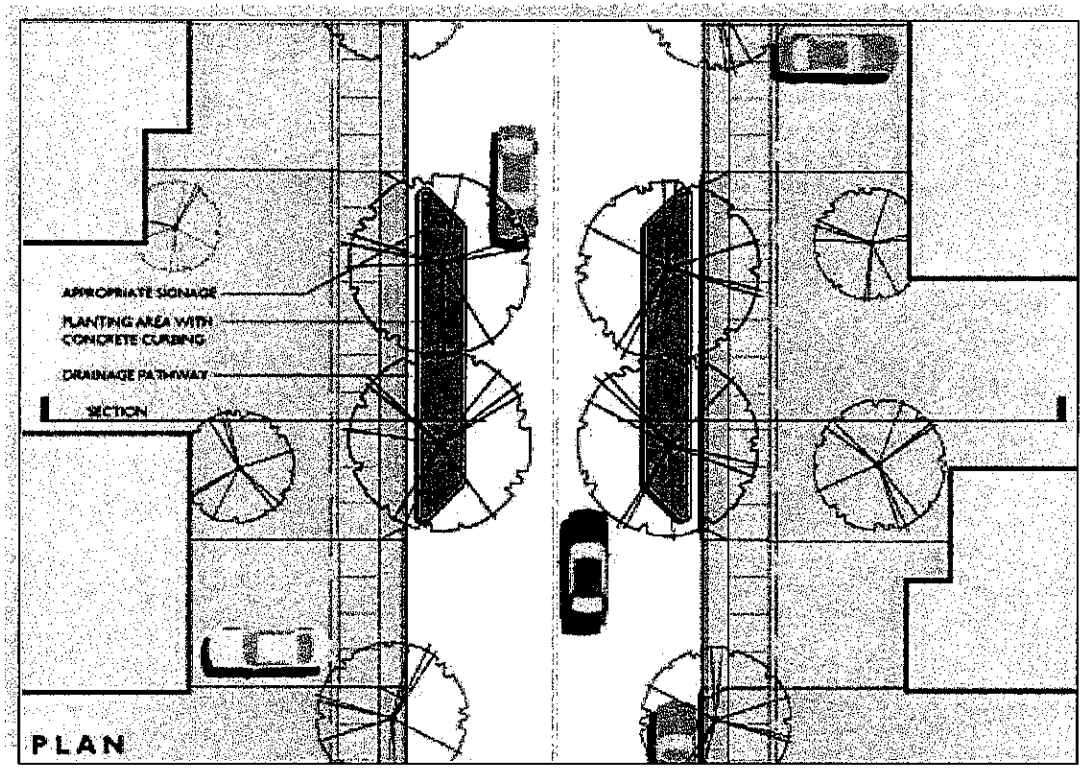

Chockers

Device	Change in Volume
Chocker	-20%

Device	Change in Speed
Chocker	-14%

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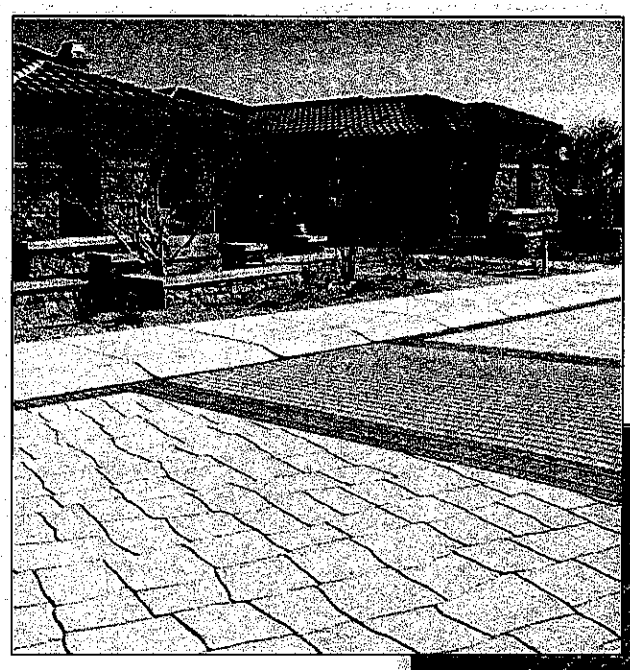
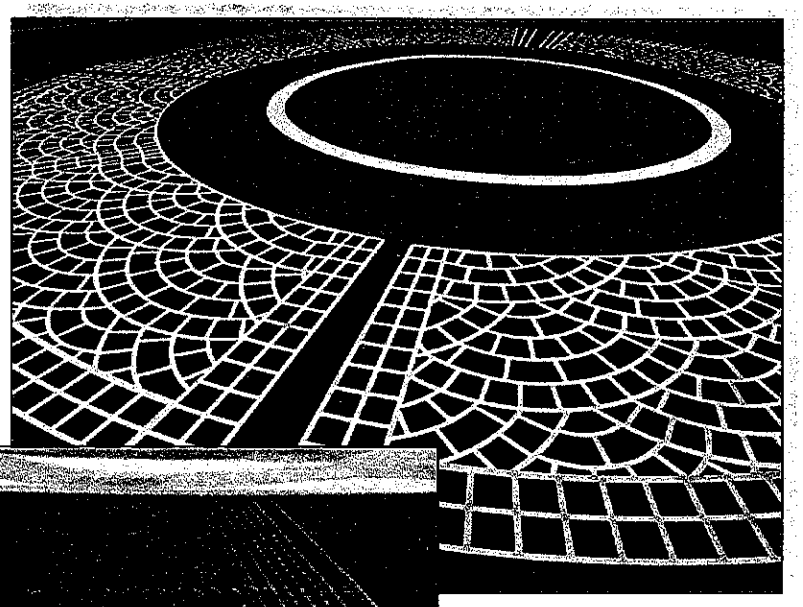
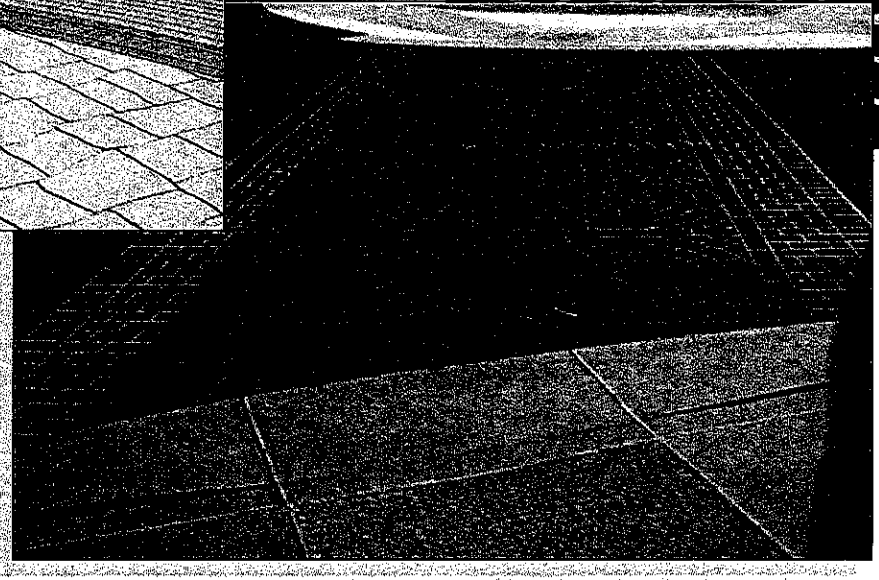
Textured Pavement / Rumble Strips







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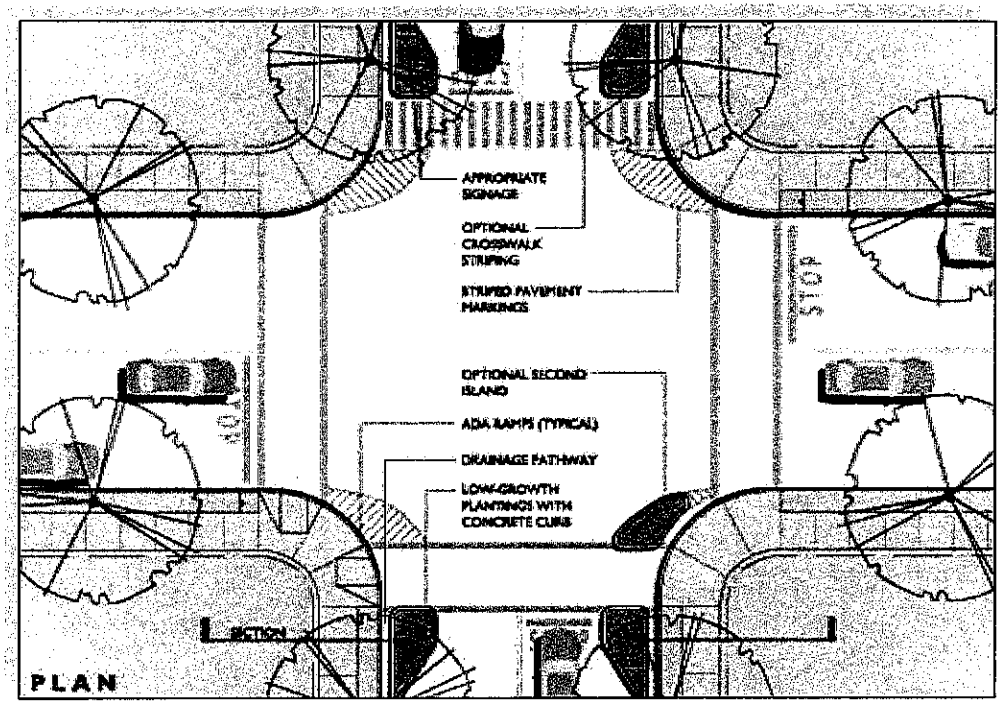
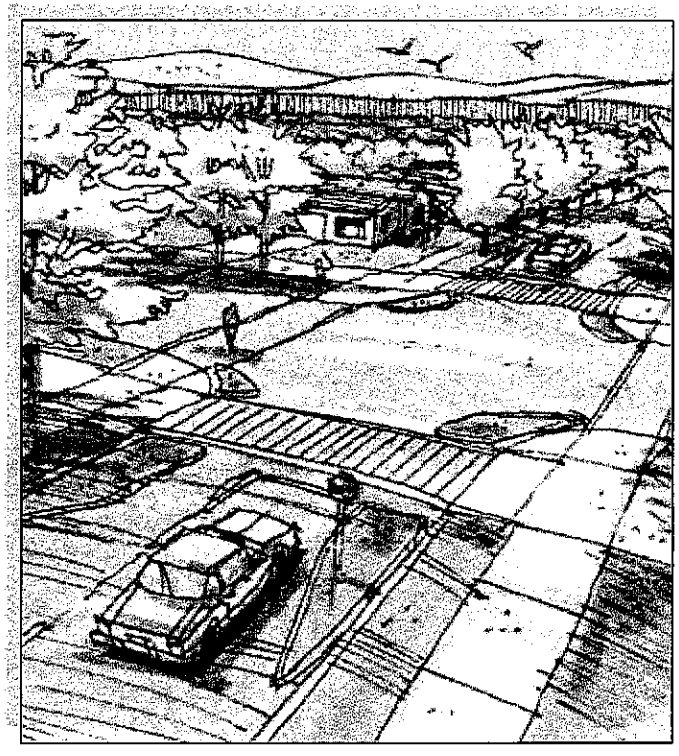
Intersection Bulbouts





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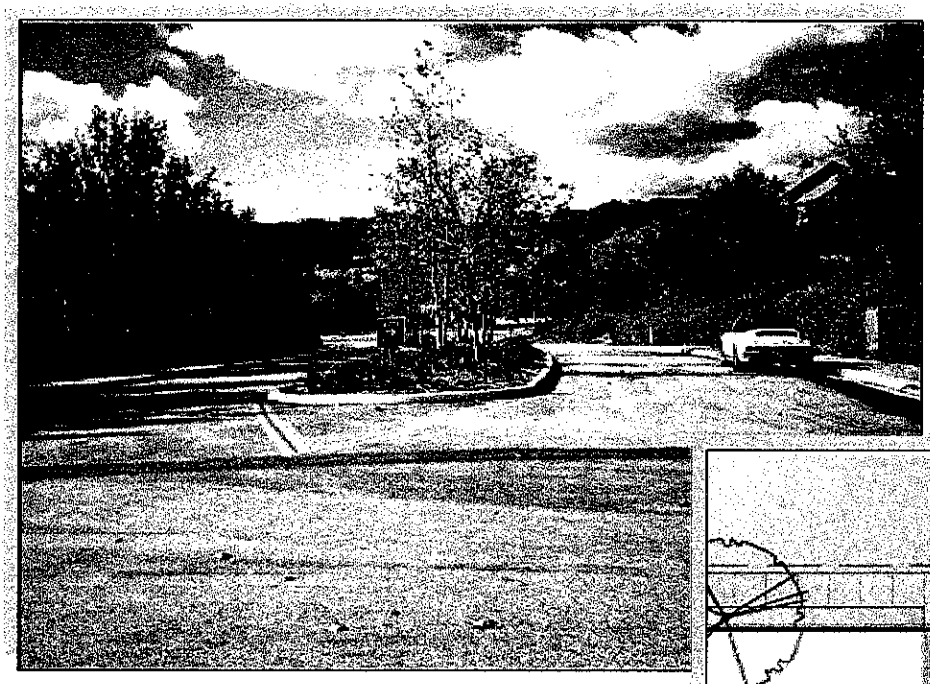
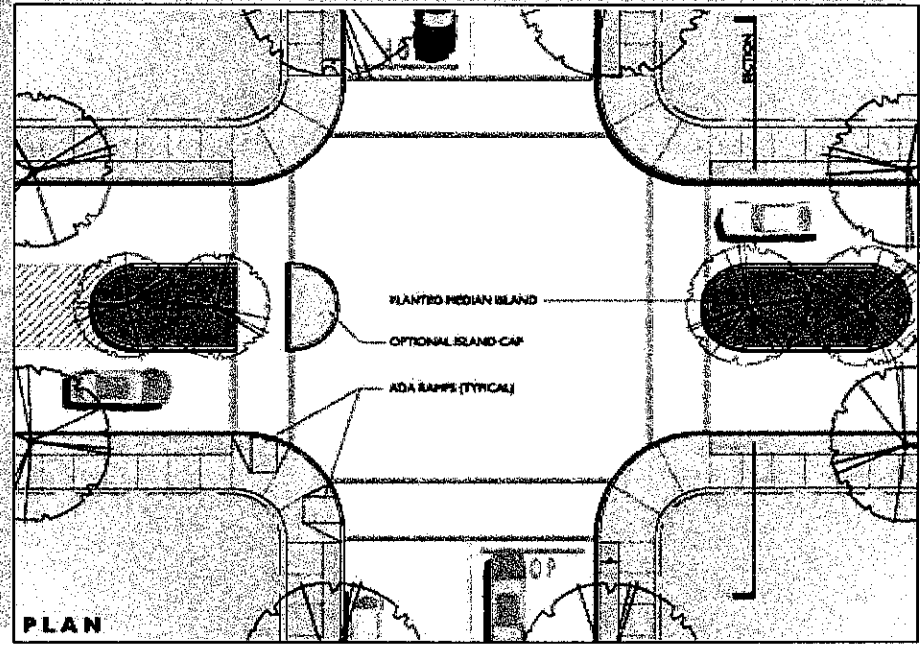
Medians





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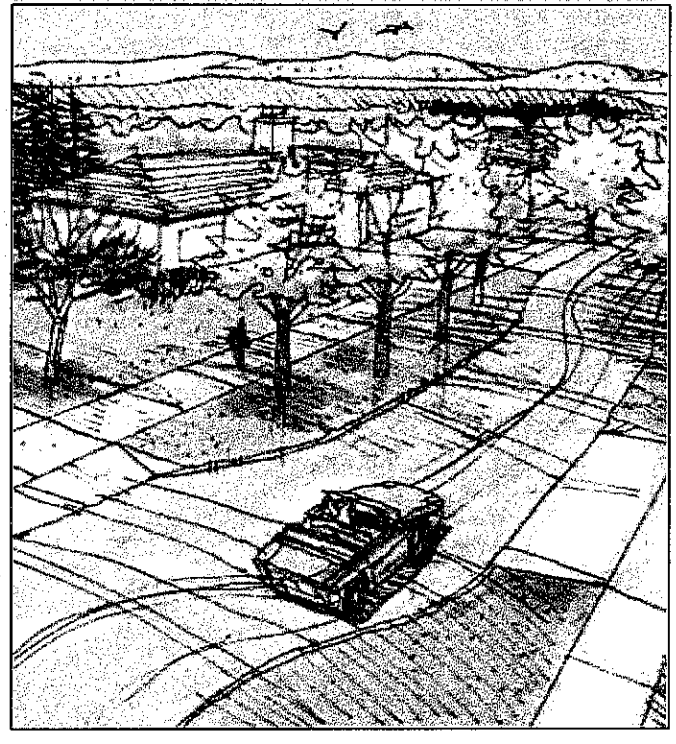
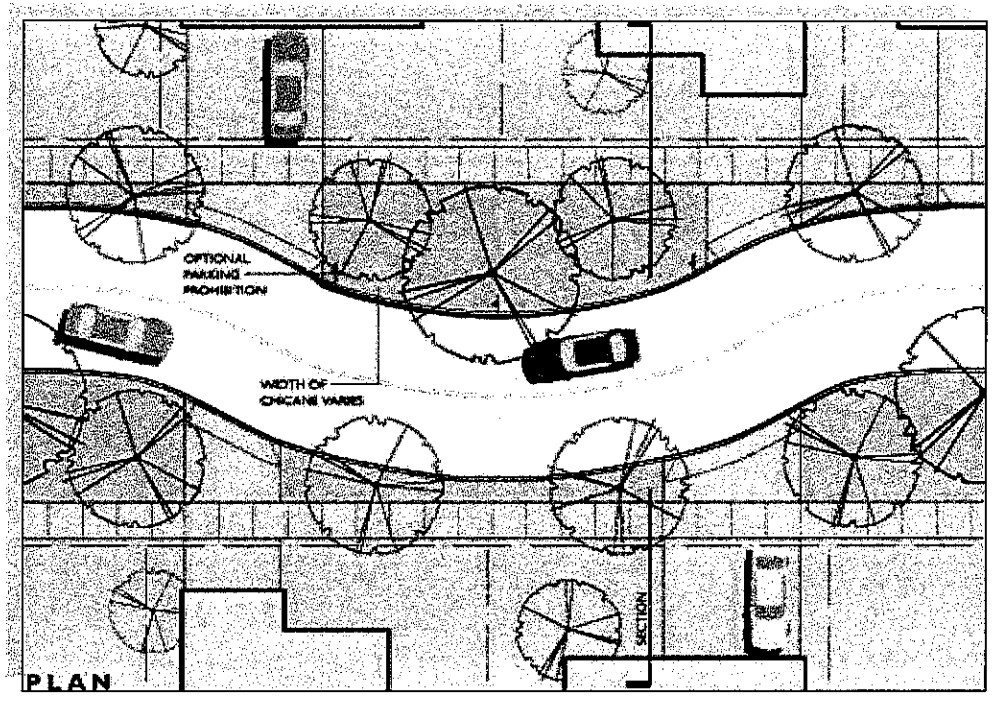
Chicanes





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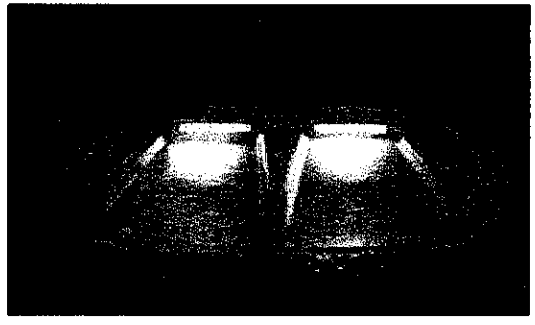
Flashing Crosswalks

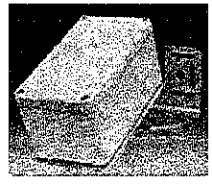


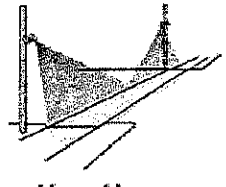
Activation Devices

Pushbutton options

LED enhanced

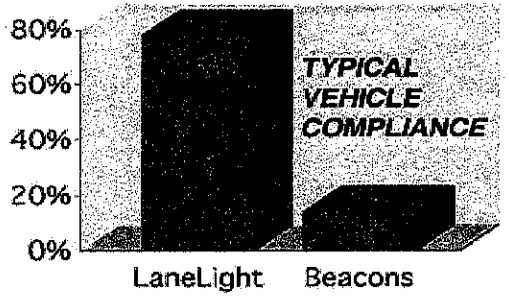
Model X





Microwave activation

- extended crossing option available




Thank You
RK
engineering
group, inc.