SURVEYOR BLVD. @ BELT LINE RD.
NORTHBOUND RIGHT TURN LN.

LOTS 1 & 2, BLOC 1

BELT LINE - SURVEYOR VILLAGE

12/18/97

dedicated right-of-way

PLAT FILE

Oxford®

RICHARD KING - DECT Line + Surveyor
214-343-9400
FAX: 214-341-9060

TOWN OF ADDISON

LETTER OF TRANSMITTAL

Public Works / Engineering
16801 Westgrove • P.O. Box 144
Addison, Texas 75001
Telephone: (214) 450-2871 • Fax: (214) 931-6643

DATE 3/12/01	JOB NO.
ATTENTION RICHARD KING	
RE: BELTLINE & SURVEYOR DRIVE REQUIREMENTS	

TO RICHARD KING
FAX: 214-341-9060

GENTLEMAN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans , ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☒ DRIVE & RIGHT-OF-WAY REQUIREMENTS

COPIES	DATE	NO.	DESCRIPTION
1			TABLES & DRIVE TYPICAL DATA

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO FILE

SIGNED: JIM WILSON

If enclosures are not as noted, please notify us at once.

TABLE 21 (9)

Desirable Minimum Driveway Spacing

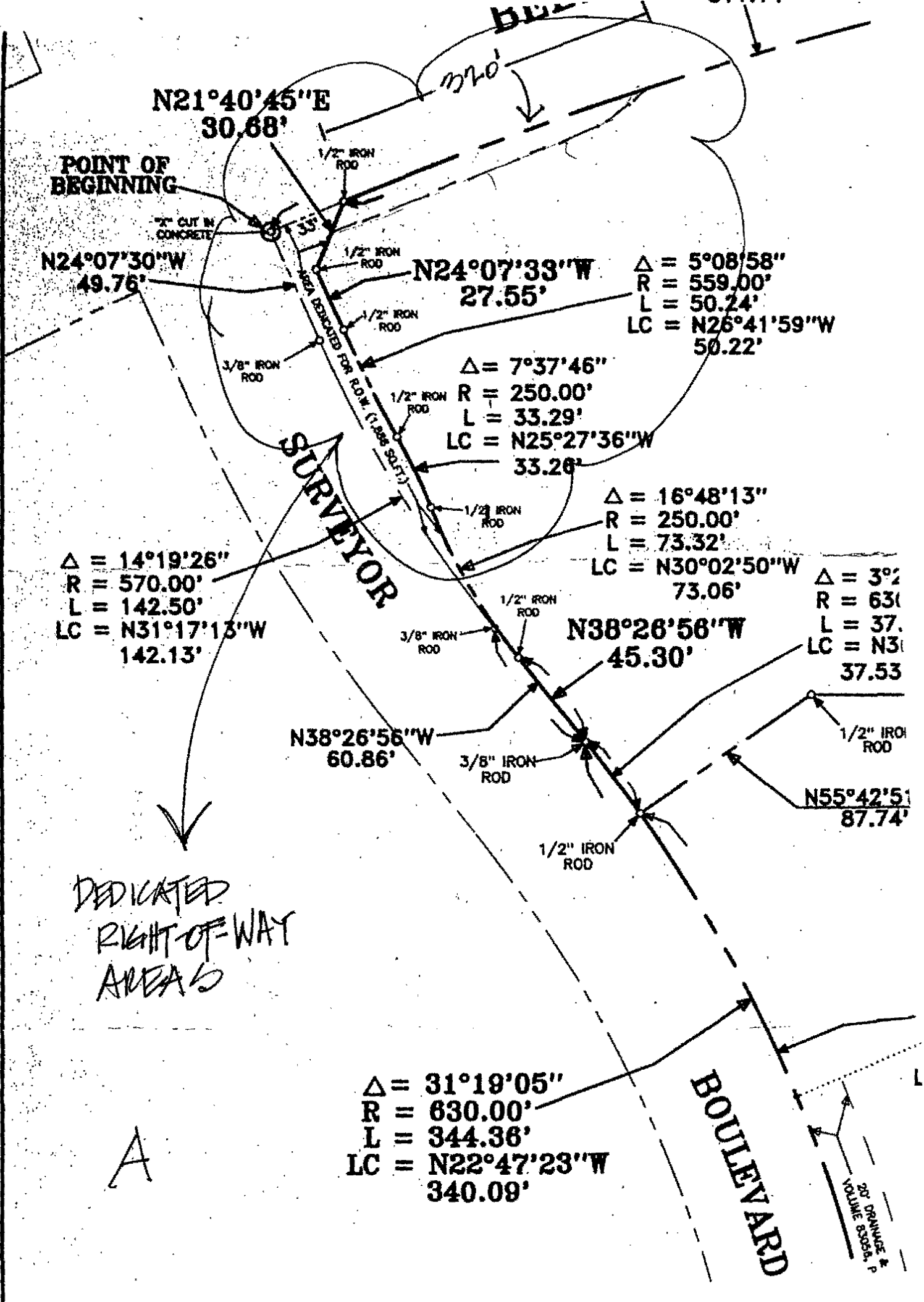
Street Type	Speed Range, MPH	Minimum Spacing Between Driveways, Feet[a,b]
BOTTLINE— Arterial	35-40	200
SURVEYOR— Collector	30-35	150
Local	25-30	100

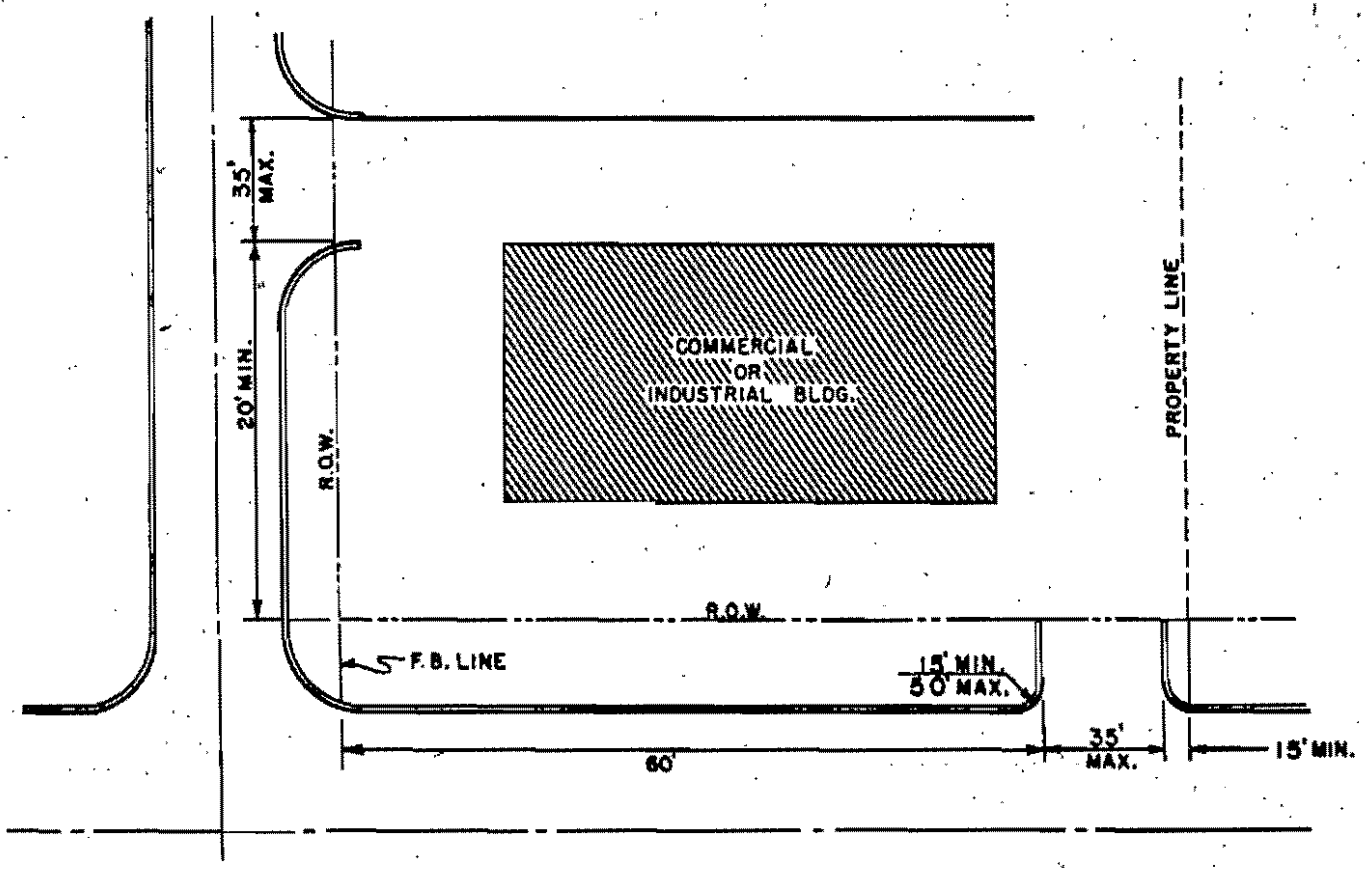
[a]These spacings are measured from driveway throat to driveway throat as shown by "J" in Figure 2.

[b]The minimum spacings can be halved if the adjacent driveways are operated as a one-way pair.

The above minimum driveway spacings (Table 21) will prevent conflicting movements at adjacent driveways from overlapping. It is recognized that at some sites these minimum values may be too restrictive, and if justified by an engineering study of site conditions, lesser spacings may be used. But, under no conditions should commercial and industrial driveway spacings be reduced below the critical minimum values stated in item "J" of Figure 2 for the various street classifications.

In addition, as depicted below, it is desirable to space driveways to reduce the potential conflicts that could arise between vehicles entering the street system from a driveway and those on the street itself. These spacings were determined using a running speed of 30 mph for the through lanes, 15 mph for a turning speed from intersecting streets, and an acceleration of 3.0 ft/sec^2. The higher limit represents the spacing that allows the second vehicle to proceed without reducing speed and the lower limit would require the second vehicle to alter speed or direction.


N21°40'45"E
30.68'
POINT OF BEGINNING
"X" CUT IN CONCRETE
1/2" IRON ROD
N24°07'30"W
49.76'
N24°07'33"W
27.55'
Δ = 5°08'58"
R = 559.00'
L = 50.24'
LC = N26°41'59"W
50.22'
3/8" IRON ROD
Δ = 7°37'46"
R = 250.00'
L = 33.29'
LC = N25°27'36"W
33.26'
SURVEYOR
Δ = 16°48'13"
R = 250.00'
L = 73.32'
LC = N30°02'50"W
73.06'
Δ = 14°19'26"
R = 570.00'
L = 142.50'
LC = N31°17'13"W
142.13'
N38°26'56"W
45.30'
N38°26'56"W
60.86'
3/8" IRON ROD
DEDICATED RIGHT-OF-WAY AREAS
Δ = 31°19'05"
R = 630.00'
L = 344.36'
LC = N22°47'23"W
340.09'
BOULEVARD
A



TYPICAL DRIVEWAYS TO A CORNER
COMMERCIAL ESTABLISHMENT OR PUBLIC BUILDING—URBAN
Figure 13

Arterial Speed (mph)	Approach Geometry (feet) L_1	L_2	W_1 (1)	W_2 (2)	R_1
45	120	250	12	30	20
→ 40	120	200	12	32	15
→ 35	90	120	12	34	10

Departure Geometry (feet) W_3 (3)	R_2	L_3	θ
28	20	30	5
30	15	15	5
30	25	0	0

(1) Excluding curb and gutter

(2) Back-to-back of curb's total width, entrance width, W_2, divided by solid white line, lane line to back of curb as follows:

W_2	Right Lane	Left Lane
30	16.5	13.5
32	18.5	13.5
34	20.5	13.5

(3) Total width back to back of curb; divided solid white line as follows:

W_3	Right Lane	Left Lane
28	14.5	13.5
30	16.5	13.5

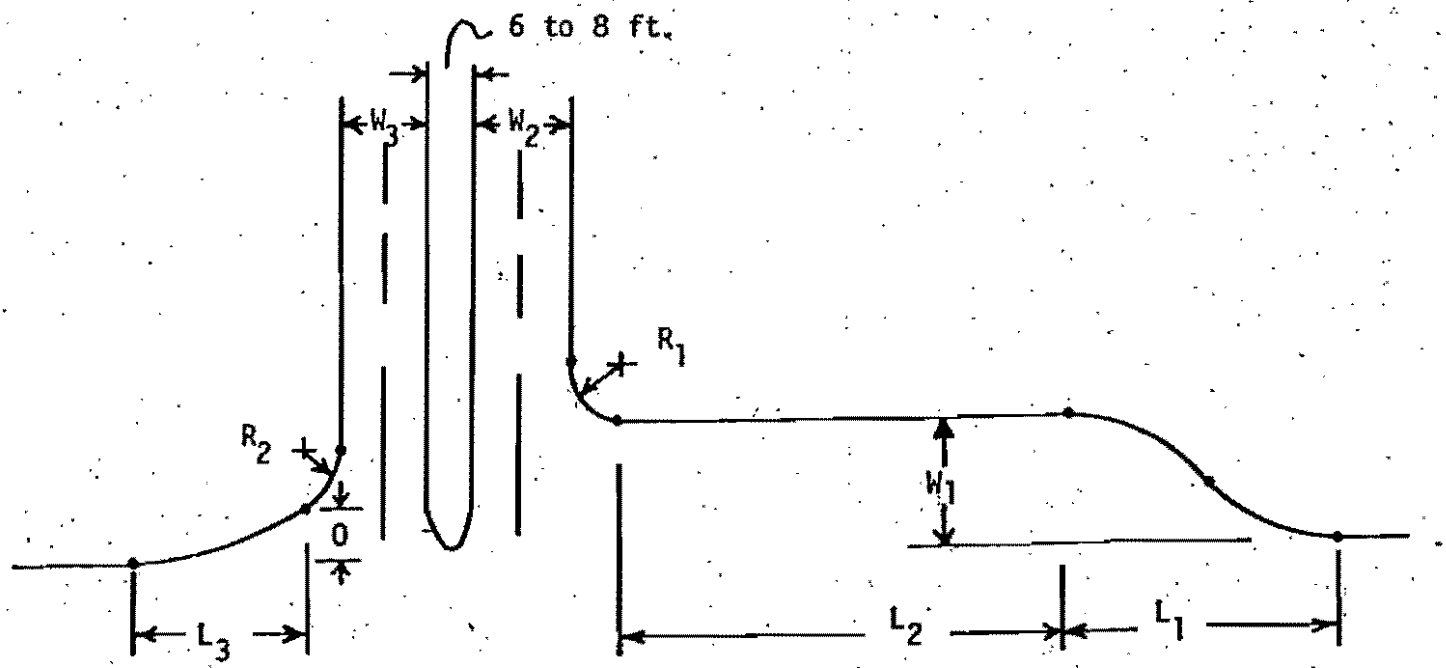


FIGURE 37. SUGGESTED DESIGN FOR DIVIDED DRIVEWAY ACCESS TO ARTERIAL STREETS (8)

driveway.

- Residential Driveway Access to Arterial Streets. Residential driveway access to arterial streets should not be permitted except for major multiple family "cluster" developments.

- Frequency of direct access driveways:

Functional Classification	Urban	Rural
Primary Arterial	Major generators under specific conditions	2 per mile per side, farm residences and field drives only
Secondary Arterial	1 per 200 ft. of frontage	6 per mile per side
Collector	2 per 100 ft. of frontage	No restriction on number
Local (Residential)	No Control	No Control

- Driveway Spacing. Driveways should be spaced a minimum of 200 feet (example for 40 mph arterial) apart to provide safe traffic operation on arterials and driveways during all periods (peak and off-peak) of the day. In some instances, where such spacing would create a hardship, but where the average spacing of driveways within 300 feet of the subject property could be maintained at 200 feet, a minimum spacing of 150 would be permissible.

Where such spacing control cannot readily be achieved within a particular parcel, joint access with an adjoining property should be sought.

If officials are satisfied that sufficient attempts to secure joint access have been made and that joint access is still not possible, and access cannot be provided via another street, driveway access to the arterial may be granted if minimum corner clearances are met. However, this access should be limited to right turns in and out (left turns in and out prohibited).

- Corner Clearance (example for 35 mph arterial). The minimum tangent curb length between a driveway and an intersection of the arterial with a cross street should be 50 feet. If the intersection is or is likely to be signalized, then traffic movements to and from any driveway within 125 feet of an inter-

section with a collector and 250 feet of an intersection with an arterial should be limited to right turns only.

- Property Clearance. The minimum distance between the property line of a parcel and the nearest edge of the nearest driveway to that property line should be 100 feet, except if the driveway provides joint access to more than one parcel. A joint access driveway may be located on the property line.

- Sight Distance. Adequate sight distance should be available at every driveway. Any movement for which adequate sight distance is not available should not be permitted. Joint access or access to another street should be sought in such cases.

- Median Openings. If and when medians are constructed on any arterial (street) spacing between median openings should be at least 400 feet. The spacing may be reduced to 300 feet if a competent traffic study shows that a lesser spacing will still safely and efficiently accommodate left turn movements to existing and projected future development in the immediate vicinity.

- Number of Driveways. Each parcel should be permitted access through one driveway, either on the parcel or as part of joint access. Additional driveways may be needed and provided under the following conditions:

  1. If the daily volume using one driveway would exceed 5,000 vehicles (both directions).

  2. If traffic using one driveway would exceed the capacity of a stop sign controlled intersection during one peak street traffic hour on the peak site traffic hour.

  3. A competent traffic analysis shows that traffic conditions warrant two or more driveways.

In all cases, minimum spacings and clearances should be provided. For major traffic generators, it may be more appropriate to signalize certain driveway intersections than to provide more non-signalized driveways. Any driveway signals should be located to provide proper spacing of signals.

- Driveway Layout. The configuration or arrangement of driveways along a street can influence traffic operations at individual driveways. For this reason, driveways should be located, designed, and operated to function as a coordinated system of access points. Every time a new driveway is constructed, it must be coordinated with existing driveways. It is particularly important to fully coordinate the location, design, and operation of all driveways serving the same development.

Some basic principles relating to driveway arrangement and layout to consider in developing a coordinated system of access points are discussed below:

1. Motorists are very hesitant to violate normal one-way traffic operation (enter on the right and exit on the left), if it is implied by the driveway layout. Two driveways serving the same development located side by side, strongly imply normal one-way operation. Motorists will tend to enter using the driveway on the right (looking from the street) and exit using the driveway on the left (looking from the street). To a lesser extent, motorists even associate normal one-way operation with three driveway configurations. They will tend to use the far right driveway for entrance maneuvers, the far left driveway for exit maneuvers, and the middle driveway for both.

2. If a particular driveway configuration does not imply normal one-way operation, drivers tend to enter using the first driveway they reach. They tend to exit using this same driveway if returning to the point of origin of their trip.

3. Drivers will tend to avoid driveway maneuvers which are difficult, hazardous, or illogical. They avoid driving behind a building or through an intersection to use the "proper" driveway if access to the "improper" driveway is more convenient and use of this driveway is not physically restricted.

4. A turning maneuver may be discouraged by geometric design features (i.e., small turning radius, angled driveway, etc.), but design features alone generally do not imply to motorists that the discouraged maneuver is illegal or prohibited. Some motorists will invariably violate the intended meaning of the design if signing and/or pavement markings are not used. Even then, some violations may occur.

- Type of Operation (Two-Way Versus One-Way). A two-way driveway can efficiently service several hundred vehicles per hour (vph) if properly designed and controlled. The capacity of a two-way driveway is essentially the same as a stop controlled "T" intersection.

If peak hour volumes exceed 100 vph, however, a divided driveway or one-way driveway pair should be considered inlieu of a two-way driveway. One-way operation is particularly desirable when there are over 40 left turns per hour at a driveway and property frontage exceeds 200 feet in length.

Driveway design must be completely coordinated with the type of driveway operation. Separate design standards should be used for two-way and one-way driveways.

- Number of Lanes per Driveway. To a great extent, the width for ingress movements will be determined by the turning requirement. Egress width will be determined by peak turning volumes. Generally, if egress left turns exceed 100 per hour, two egress lanes should be provided. Otherwise, one lane will be sufficient.

- Prohibition of Turns. Left turns should be prohibited to and/or from driveways under the following conditions:

1. Inadequate corner clearance (prohibit left turns to and from)
2. Inadequate sight distance (prohibit left turns with inadequate

sight distance)

3. Inadequate driveway spacing (prohibit left turns to and from)

4. Median opening too close to another median opening (prohibition dependent on specific location of adjacent openings)

5. Other capacity, delay, or safety conditions identified by agency making specific left turns detrimental to public interest.

Most desirably left-turn prohibitions are implemented physically with median channelization (if a median exist) or driveway channelization. Signing should also be installed as necessary. In cases where multiple driveways with limited turns are needed, right-turns may need to be prohibited. Effective channelization should be provided for such driveways.

- Left-Turn Lanes. When the peak hour, left turn warrant is met, left turns lanes with the appropriate storage length should be provided.

- Right-Turn Lanes. A right-turn deceleration lane should be installed at each driveway with an average daily volume of at least 1,000 vehicles and an average peak-hour inbound right-turn of at least 40 vehicles.

Where several successive driveways meet the above warrant or where driveway spacing is not adequate to avoid encroachment of the right-turn lane or another driveway, a continuous right-turn lane should be used. Continuous right-turn lane should also be provided when 20 percent of the directional volume on an arterial (35 mph or higher) makes right turns.

- Parking. Curb parking should be prohibited on all arterial streets (in some cases, localized parking conditions make this impossible).

- Frontage Roads (if applicable). All driveway access along arterials with existing or planned frontage roads should be provided to (future) one-way frontage roads. To gain <u>temporary</u> direct access to the arterial (prior to improvement of that facility and construction of the frontage road system), the petitioner should construct the section of frontage road adjacent to his/her property. This frontage road section should be located where planned.

Any right-of-way within 100 feet of the arterial centerline not previously dedicated should be dedicated prior to issuance of a temporary direct access (to the arterial) driveway permit.

When driveway access is provided from frontage roads, driveway spacing and property clearance and minimum lot width requirements may be reduced by one-third. However, minimum driveway spacing for temporary direct access to the arterial should be adjacent to insure safe traffic operation at the design speed.

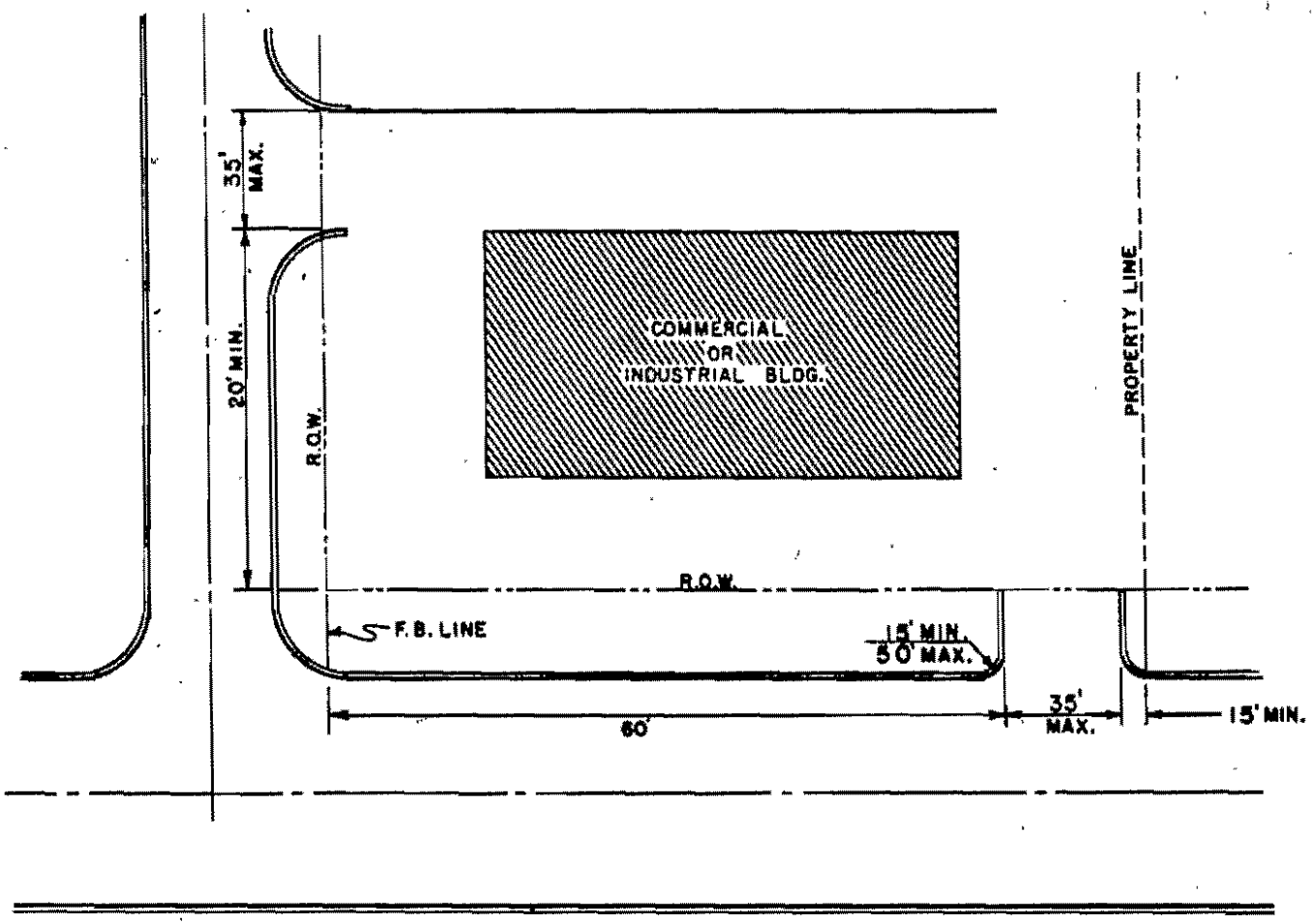
- Special Land-Use Requirements. Certain land uses will require driveways which do not totally conform to the guidelines stated previously. Examples of these land uses are service stations and drive-in banks. Applications for permits for "non-conforming" driveways for any such land use should be accompanied by a traffic engineering study technically justifying the non-conforming features. However, in no case should variations in corner clearances be permitted, since they are critical to safe, efficient intersection operation.

In summary, there are numerous cost-effective ways to preserve or increase roadway capacity, and safety. These are listed in Table 19. Many of these methods can be used to improve existing conditions as well as for new driveways. (4)

TABLE 19

Cost-Effective Techniques to Preserve Roadway Capacity and Safety

Technique	Comment
Capacity	
Provide two driveway exit lanes rather than one.	Driveway ADT over 1,000.
Provide additional driveway.	Driveway ADT over 5,000.
Provide left-turn lane on arterial.	Varies.
Provide left-turn deceleration lane.	35 mph, 40 or more peak-hour right turns.
Provide continuous right-turn lane.	35 mph, 20 percent right turns during day.
Provide direct access only from frontage roads.	40 mph, 20,000 ADT, short frontages.
Signalize driveway intersection.	See *Manual on Uniform Traffic Control Devices*.
Safety	
Prohibit parking on arterial streets.	All locations.
Provide adequate driveway entrance width.	Provide minimum 15 mph turning speed.
Provide two driveways with limited turns rather than two standard driveways.	"T" driveway intersections, 40 left turns in one direction, 200-foot minimum frontage.
Provide two one-way driveways rather than one two-way driveway.	Same as above.
Channelize driveways or install median to prohibit selected movements.	Less than 100 prohibited turns per day, high driveway densities or driveway close to intersection.
Insure adequate sight distance	See AASHTO *Policy on Geometric Design of Rural Highways*.
Capacity and Safety	
Minimum driveway spacing.	See Table 2.
Minimum corner clearance.	50 feet or distance based on Table 3, whichever is greater.
Minimum property clearance.	One-half values in Table 2.
Provide access from collector street in lieu of access from arterial street.	Corner residential parcels, corner parcels requiring more than one driveway.
Consolidation of access and connections between adjacent properties.	Frontages too short to permit minimum spacing.
Provide adequate internal circulation and parking space.	Always.



TYPICAL DRIVEWAYS TO A CORNER
COMMERCIAL ESTABLISHMENT OR PUBLIC BUILDING—URBAN
Figure 13

Arterial Speed (mph)	Approach Geometry (feet) L_1	L_2	W_1 (1)	W_2 (2)	R_1
45	120	250	12	30	20
40	120	200	12	32	15
35	90	120	12	34	10

Departure Geometry (feet) W_3 (3)	R_2	L_3	0
28	20	10	5
30	15	15	5
30	25	0	0

(1) Excluding curb and gutter

(2) Back-to-back of curb's total width, entrance width, W_2, divided by solid white line, lane line to back of curb as follows:

W_2	Right Lane	Left Lane
30	16.5	13.5
32	18.5	13.5
34	20.5	13.5

(3) Total width back to back of curb; divided solid white line as follows:

W_3	Right Lane	Left Lane
28	14.5	13.5
30	16.5	13.5

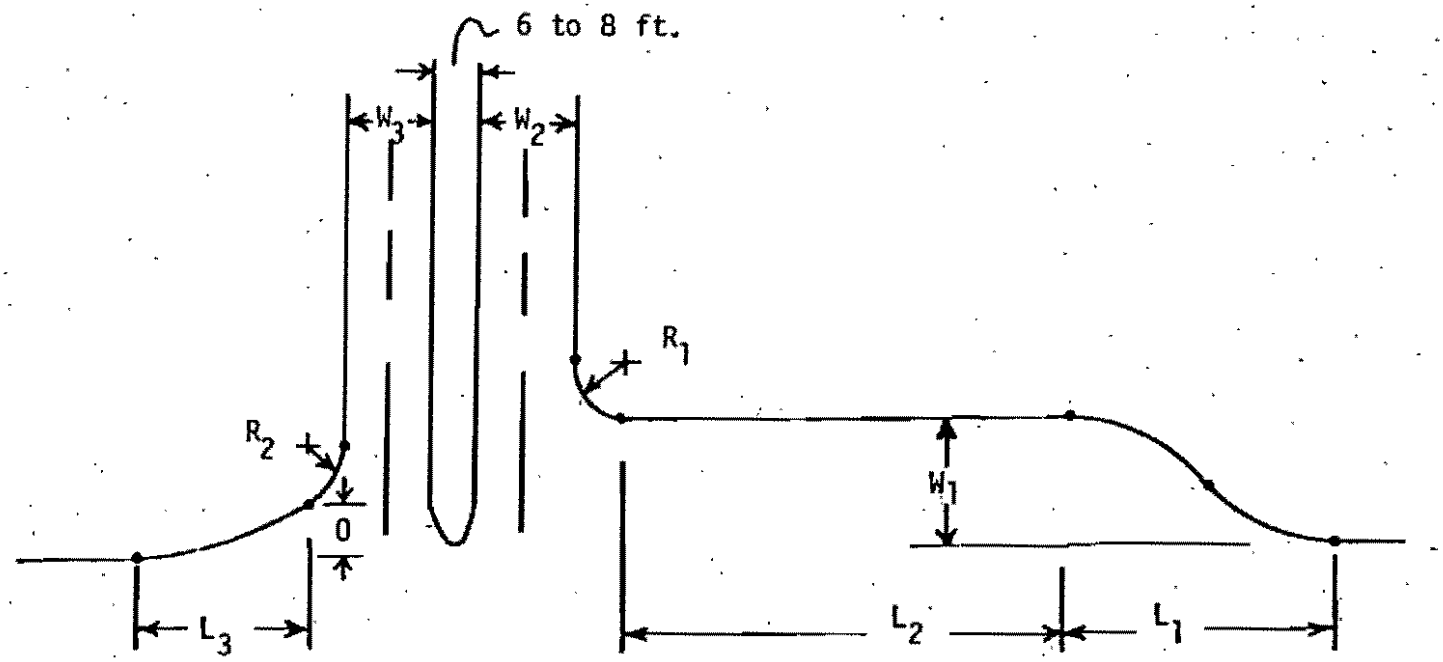


FIGURE 37. SUGGESTED DESIGN FOR DIVIDED DRIVEWAY ACCESS TO ARTERIAL STREETS (8)

TABLE 21 (9)

Desirable Minimum Driveway Spacing

Street Type	Speed Range, MPH	Minimum Spacing Between Driveways, Feet[a,b]
Arterial	35-40	200
Collector	30-35	150
Local	25-30	100

[a]These spacings are measured from driveway throat to driveway throat as shown by "J" in Figure 2.

[b]The minimum spacings can be halved if the adjacent driveways are operated as a one-way pair.

The above minimum driveway spacings (Table 21) will prevent conflicting movements at adjacent driveways from overlapping. It is recognized that at some sites these minimum values may be too restrictive, and if justified by an engineering study of site conditions, lesser spacings may be used. But, under no conditions should commercial and industrial driveway spacings be reduced below the critical minimum values stated in item "J" of Figure 2 for the various street classifications.

In addition, as depicted below, it is desirable to space driveways to reduce the potential conflicts that could arise between vehicles entering the street system from a driveway and those on the street itself. These spacings were determined using a running speed of 30 mph for the through lanes, 15 mph for a turning speed from intersecting streets, and an acceleration of 3.0 ft/sec^2. The higher limit represents the spacing that allows the second vehicle to proceed without reducing speed and the lower limit would require the second vehicle to alter speed or direction.

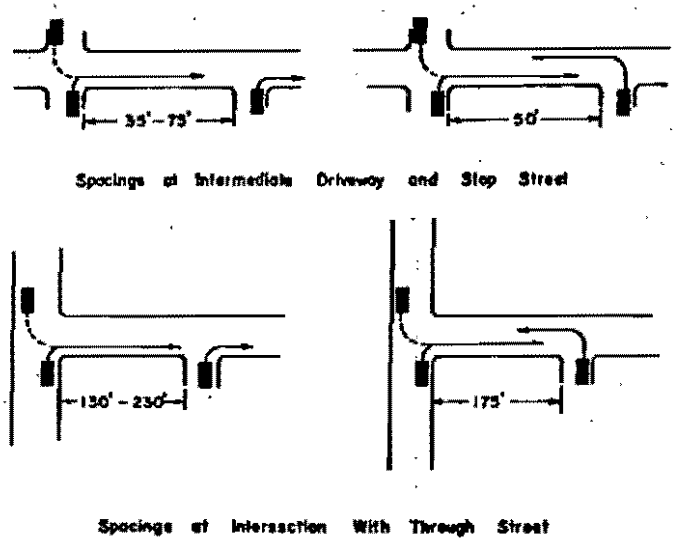


Figure 3. Minimum driveway spacings as controlled by vehicle trajectories. (3)

The spacing between a driveway and an adjacent street intersection (corner clearance) should be regulated to enhance traffic safety and operations in the intersection area. However, similar to driveway spacing, corner clearance control is sometimes difficult due to the existence of corner properties with insufficient frontage lengths to enable good driveway location. Again, subdivision standards should recognize corner clearance requirements.

Corner clearance requirements for commercial and industrial properties or collector - local streets and the various intersection combinations for arterial streets are shown in Table 22 and Table 23.

TABLE 22 (9)

Collector and Local Street

Miminum Corner Clearance

Street Type	Minimum Corner Clearance, Feet[a]	
	Desirable Minimum[a]	Critical Minimum[b]
Collector	100	50
Local	100	50

TABLE 23 (9)

Arterial Minimum Corner Clearances

Intersection Type	Mimimum Corner Clearance, Feet[a] Desirable Minimum	Critical Minimum
Arterial-Arterial	300	250
Arterial-Collector	200	125
Arterial-Local	100	50

[a]Corner clearance is measured from the intersection curb to the near driveway curb.

[b]Desirable minimum corner clearance is the clearance needed to assure that conflicting driveway and intersection movements do not overlap.

Another significant reason to ensure adequate corner clearance is the effects on the street system created by driveway blockage. As shown below, driveways located too close to an intersection can be blocked by vehicle queues on the street system causing delay to the driveway user in making an exiting maneuver. The opposite is also true when vehicles desire to enter a driveway that is blocked by a vehicle queue. In this case, the potential exists for delay to occur on two different streets as shown below.

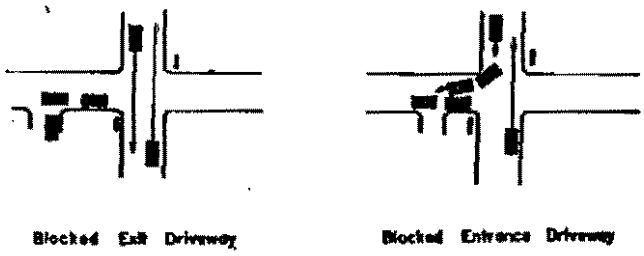


Figure 4. Blocking of near corner driveways. (3)

Based on the principles of queueing theory, Table 24 depicts the probability of a driveway located on a street near a stop intersection becoming blocked by a vehicle queue. These probabilities consider variables such as corner clearance, intersection service rate, and volumes in the lane adjacent to the driveway. As indicated by Table 24, as traffic flow in the lane adjacent to the driveway approaches the capacity of the intersection, the probability that the intersection will be blocked increases rapidly for very limited corner clearances. Therefore, corner clearances of at least one vehicle (roadway space of 25 feet plus 10 feet between stop bar and curb extension on the cross street) would be desirable for all classes of roadway. The most desirable, as indicated by Table 24, would be a roadway space of about three vehicles or about 85 feet which would avoid blocking for most traffic use levels.

TABLE 24

Probability of Driveway Blocking

(near corner on stop street) (3)

VOLUME IN LANE ADJACENT TO DRIVEWAY (VPH)	INTERSECTION SERVICE RATE (VPH)	PROBABILITY THAT DRIVEWAY IS BLOCKED (%), BY CORNER CLEARANCE (NO. OF VEHICLES)						
		0	1	2	3	4	5	6
50	100	50	25	13	6	3	2	1
	200	25	6	2				
	300	17	3	1				
	400	13	2					
	500	10	1					
100	200	50	25	13	6	3	2	1
	300	33	11	4	1			
	400	25	6	2				
	500	20	4	1				
	600	17	3	1				
150	200	75	56	42	32	24	18	13
	300	50	25	13	6	3	2	1
	400	38	10	5	2	1		
	500	30	9	3	1			
	600	25	6	2				

February 23, 2001

Mike/Jim:

Carmen recently showed me a file final plat of Belt Line-Surveyor Village Addition, dated January, 1998. As shown on the attachment, this plat included acquisition of right-of-way for the future construction of a right turn lane on Surveyor Blvd., at Belt Line Road. Also, attached is a copy of the CIP listing for proposed right-turn lane improvements at this intersection. While we are considering the re-allocation of funds for certain projects, would it be a good time to initiate a contract for design and subsequent construction of this right-turn lane? The original project estimate was $50,000. A "rough" updated estimate was generated to include surveying, design, and construction of a new right-turn lane(including removal and replacement of pavement & signal and utility line improvements). The cost is closer to $55,000. Thanks.

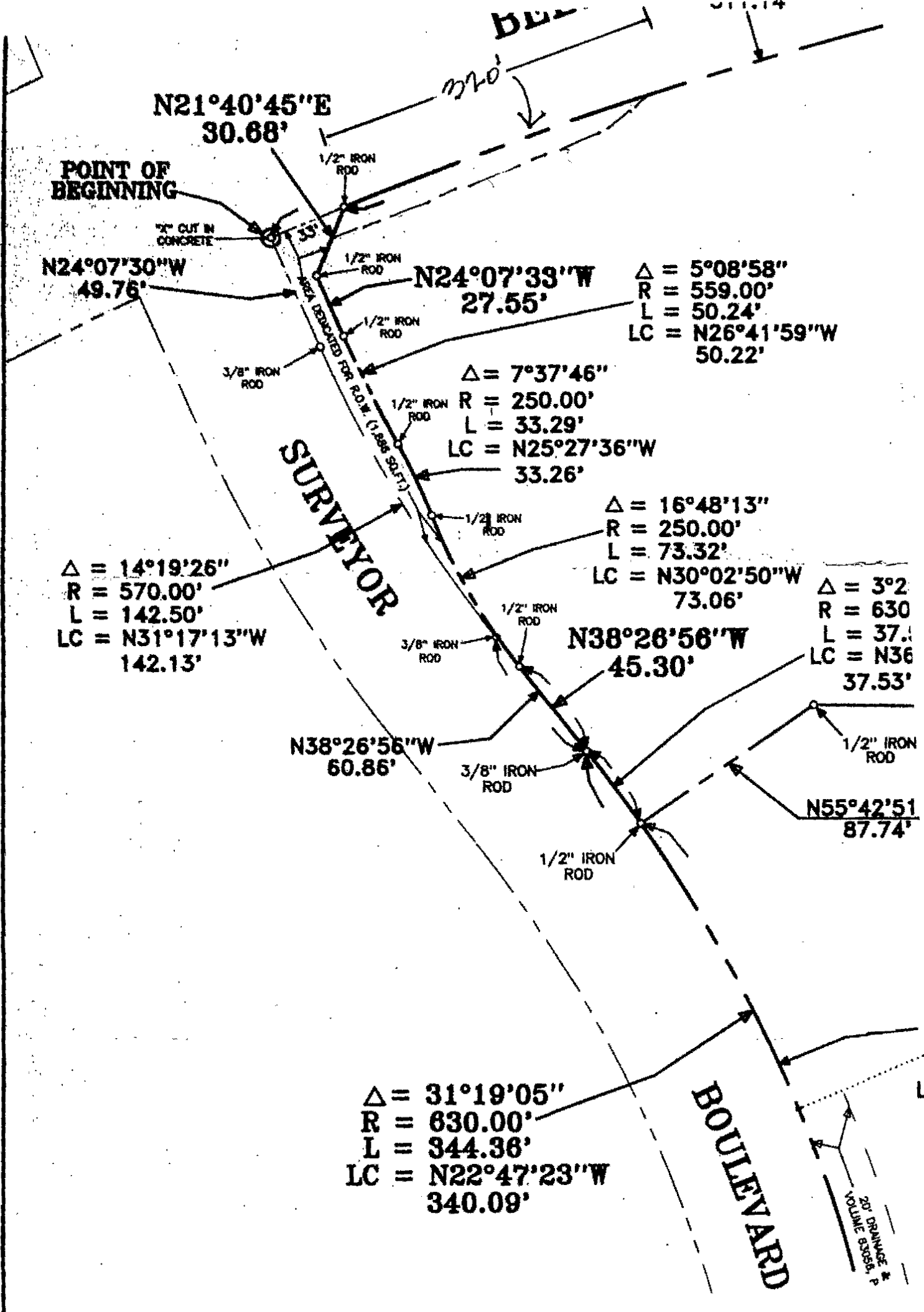
Steve C.

Surveyor Blvd. @ Belt Line Road
Northbound Right Turn Lane from Surveyor to Belt Line

Capital Project Summary

February 2001

Project Summary:	This project will provide a right turn lane for northbound traffic on Surveyor Blvd. to turn east onto Belt Line Road. Necessary right-of-way dedication is complete.
Funding:	The estimated project cost is $50,000. This project is not currently funded or programmed.
Hurdles:	None.
Schedule:	Project complete 9 to 12 months after funding.
Design Engineers:	None at this time.
Contractor:	None at this time.
Project Manager:	Steve Chutchian
Project Number:	None at this time.


N21°40'45"E
30.68'
POINT OF BEGINNING
"X" CUT IN CONCRETE
1/2" IRON ROD
33'
N24°07'30"W
49.76'
N24°07'33"W
27.55'
Δ = 5°08'58"
R = 559.00'
L = 50.24'
LC = N26°41'59"W
50.22'
3/8" IRON ROD
AREA DEDICATED FOR R.O.W. (1,886 SQ.FT.)
Δ = 7°37'46"
R = 250.00'
L = 33.29'
LC = N25°27'36"W
33.26'
SURVEYOR
Δ = 16°48'13"
R = 250.00'
L = 73.32'
LC = N30°02'50"W
73.06'
Δ = 14°19'26"
R = 570.00'
L = 142.50'
LC = N31°17'13"W
142.13'
N38°26'56"W
45.30'
N38°26'56"W
60.86'
Δ = 3°2
R = 630
L = 37.
LC = N36
37.53'
N55°42'51
87.74'
Δ = 31°19'05"
R = 630.00'
L = 344.36'
LC = N22°47'23"W
340.09'
BOULEVARD
20' DRAINAGE
VOLUME 8058, P

Surveyor / Belt Line Right Turn Lane