Maricopa County Department of Transportation

51st Avenue Safety Improvement Study

W.O. No. 68913

Prepared by:

Kirkham Michael Consulting Engineers
9201 North 25th Avenue, Ste. 195
Phoenix, Arizona 85021
(602) 944-6564

September, 1997

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
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JOHN C.
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Date Signed 9-26-97
ARIZONA, USA

Maricopa County Department of Transportation

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APPENDIX (attached)

Section	Description
I	Low Cost Alternative Plan View
II	Right-of-Way maps
III	Laveen - Development Plan Precipitation Frequency Calculations Accident Records MCDOT Daily Traffic Signal Warrant Volumes
IV	Meeting Minutes Open House Public Meeting Handout Summary of Comment Cards MCDOT Level of Service Criteria on Roadway Links
V	MCDOT Right-of-Way Division Memorandum Right-of-Way Detail at GRIC Boundary MCDOT Truck Traffic Policy MCDOT Draft Environmental Overview Alignment Alternative for St. Johns Road

TECHNICAL APPENDIX (Separate Document)

Section	Description
A	Peak Hour Background Traffic Volumes - 1997, 2000, 2005 Casino Traffic Volumes (Peak Hour) Peak Hour Total Traffic Volumes - 1997, 2000, 2005 Daily Traffic Volumes (Background) Daily Traffic Volumes (Total)
B	HCS - Level of Service Sheets - 1997
C	HCS - Level of Service Sheets - 2000
D	HCS - Level of Service Sheets - 2005
E	Level of Service Criteria Gila River Indian Community Water and Sewer Plans Gila River Indian Community Right-of-Way and Utility Plans

51st AVENUE SAFETY IMPROVEMENT STUDY

SECTIONS 20, 21, 28, 29, 32 and 33, T1N, R2E
4, 5, 8, 9, 16, 17, 20, 21, 28, 29, 32 and 33, T1S, R2E

MCDOT TRANSPORTATION PLANNING DIVISION

SEPTEMBER, 1997

WORK ORDER NO. 68913

Project Name: *51st Avenue Safety Improvement Study*

Project Termini: *Pecos Road to Broadway Road*

Requested by: *Maricopa County Department of Transportation*

PM_{10} Area? *Yes* **Length:** *12.87 km (8 miles)*

	Low Cost	High Cost
Estimated Full Project Cost:		
Pecos Road to Baseline Road		$ 5,787,251
Dusty Lane to Baseline Road	$ 2,056,010	
Baseline Road to Broadway Road	$ 4,260,489	$ 4,485,770
TOTAL	$ 6,316,499	$10,273,021

Summary Recommendation:
Widen 51st Avenue at the intersections of Dusty Lane (by others) and Estrella Road to provide for left turn lanes. Widen 51st Avenue between Elliot Road and Baseline Road to a three lane Rural Major Collector Road. Reconstruct 51st Avenue from Baseline Road to Broadway Road to a four-lane Rural Principal Arterial section with a raised median on an alignment offset to the west. The relocation of overhead electrical lines and concrete irrigation ditches and the removal or protection of well sites is required. During the design phase, a value engineering process may be exercised to reduce new right-of-way acquisition and irrigation facility relocation between Elliot Road and Baseline Road.

Improvements in the Pecos Road area have not been included in the above low cost alternative. Adding a continuous left turn lane between Pecos Road and St. Johns Road as a separate project would require approximately $137,100 in construction and $182,450 in full project costs assuming no additional right-of-way is required. It is considered outside the scope of this study to develop, analyze, and estimate the cost of any realignment of St. Johns Road to a potential common intersection with Pecos Road.

1.0 BACKGROUND

1.1 General

At the request of the Maricopa County Department of Transportation (MCDOT), Kirkham Michael (KM) analyzed the existing conditions, accident history and projected traffic volumes to determine traffic and roadway needs, the feasibility of geometric roadway improvements and the associated costs for 51st Avenue from Pecos Road to Broadway Road.

The identified portion of 51st Avenue is a north-south section line road extending from Pecos Road on the southern terminus to Broadway Road at the northern terminus (Figure 1.1.1). The community of Laveen lies north of Dusty Lane and south of Baseline Road. The study area is located within three different jurisdictions. Portions of 51st Avenue, north of Baseline Road and south of Broadway Road, are within the City of Phoenix. The remaining sections of 51st Avenue, north of Dusty Lane, are within the jurisdiction of Maricopa County. The southern portion of 51st Avenue, from Pecos Road to Dusty Lane, is within the jurisdiction of the Gila River Indian Community; however, Maricopa County has been granted a 30.4m (100 ft.) wide roadway easement in this area. Although the identified portion of 51st Avenue crosses many boundaries, the majority of the study section is under the jurisdiction of Maricopa County.

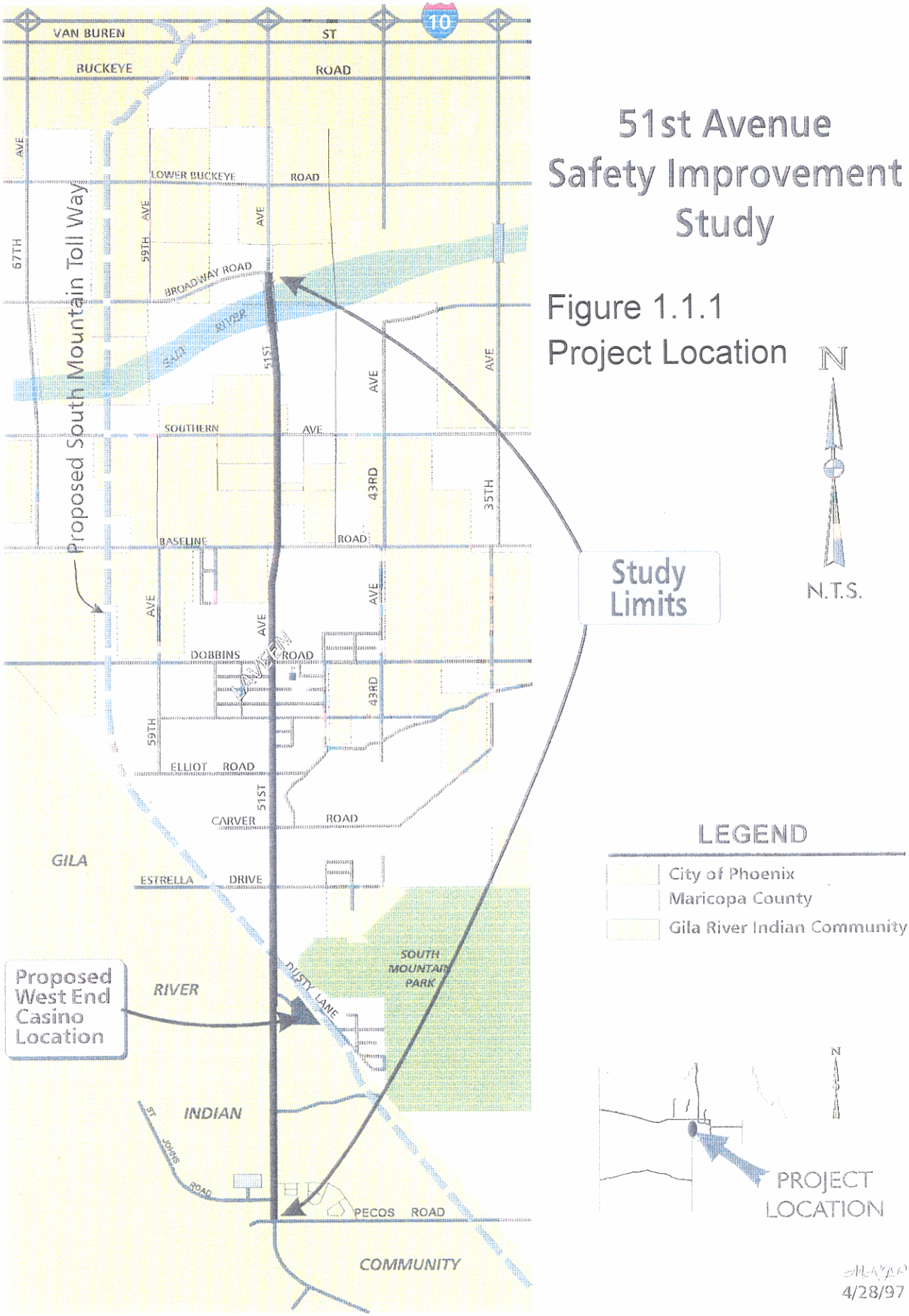
The section of 51st Avenue analyzed in this study consists of a two-lane, rural roadway section. The 51st Avenue study section is located in southern Maricopa County, adjacent to the western end of the South Mountain Park. The project lies entirely within Maricopa County. The City of Phoenix limits make up the existing east right-of-way line from the Salt River to Broadway Road, 12.2 m (40 feet) east of the 51st Avenue section line. From the east-west mid-section line of Section 29 to the centerline of the abandoned Larson Road alignment, the City of Phoenix boundaries align with the west right-of-way line. The right-of-way line is 12.2m (40 ft.) west of the 51st Avenue section line. From Larson Road to Southern Avenue, 51st Avenue lies entirely within the City of Phoenix. From 804.7m (2,640 ft.) north of Dobbins Road to 804.7m (2,640 ft.) north of Southern Avenue, the City of Phoenix limits again align with the west right-of-way line. The right-of-way varies from 10.1m (33 ft.) to 12.2m (40 ft.) west of the centerline. Within this section, a 402.3m (1,320 ft.) portion of 51st Avenue lies within the City of Phoenix. Immediately adjacent to the project, agricultural activities and residential developments make up the predominant land usage.

1.2 Regional Travel

The portion of 51st Avenue analyzed in this study is located in a predominantly agricultural/ rural area with a shortage of north/south through routes. 51st Avenue currently provides the only north/south through access west of the South Mountain Park. Regional access is provided by 51st Avenue, Southern Avenue, Baseline Road, Dobbins Road, Riggs Road (to the south) and Interstate 10 (to the north). The posted speed limit on 51st Avenue varies from 35 mph to 50 mph.

51st Avenue Safety Improvement Study

Figure 1.1.1
Project Location



4/28/97

The nearest interstate interchange is a travel distance of approximately 8km (5 mi.) to the north. The southern terminus, Pecos Road, extends as a partially paved road to the east for approximately 18.4km (11.5 mi.) to I-10. There is no traffic interchange at I-10 on the Pecos Road alignment. 51st Avenue extends south and transitions into Beltline Road, south of Pecos Road. Beltline Road connects 51st Avenue with the Riggs Road alignment which intersects I-10 at a traffic interchange. Existing freeway construction on I-10 and peak hour congestion through Phoenix make the Riggs Road/51st Avenue route a viable city bypass for vehicles during the peak hours.

The Laveen Elementary School is located on Dobbins Road east of 51st Avenue. The elementary school has a signed pedestrian crossing on 51st Avenue south of Dobbins Road. The school has approximately 1,000 students according to the Pupil Personnel Services of the Laveen Elementary School District. Field observations and discussions with school staff indicate that the majority of students are bused to and from school. A pedestrian count was conducted on March 19, 1997 that recorded a total of six (6) pedestrians crossing 51st Avenue at the school crossing south of Dobbins Road for one hour during the morning and afternoon peak hour of the school.

A planned development within the study area is a casino for the Gila River Indian Community. The casino site is located south of Dusty Lane on the east side of 51st Avenue. The casino is anticipated to be a major traffic generator for the area and is proposed to be open for operation in November, 1997.

South Mountain Park and Recreational Area is located east of 51st Avenue, between Dusty Lane and Estrella Drive. The park can be accessed from Carver Road, which is between Elliot Road and Estrella Drive.

2.0 TRAFFIC INFORMATION AND ANALYSIS

2.1 Traffic Patterns

Traffic patterns and volumes on 51st Avenue through the study section will be affected by the construction of the South Mountain Loop (toll) Road. This planned roadway would connect I-10 west of Phoenix with I-10 south of Phoenix. The alignment is planned to connect south of Phoenix near Pecos Road and extend west for approximately 16km (10 mi.) where its alignment will curve to the northwest. At Elliot Road, the alignment would then angle north and connect with I-10 at approximately 56th Avenue. The selection of a toll road designer/contractor is underway, but no decision is expected in the near future. In addition, a fund of $85,000,000 has been anticipated by ADOT and MAG to be available by the year 2007 as a set aside in the event that a tollway is not developed. Construction of a South Mountain tollway, freeway or expressway could influence a change in land use from agricultural to urban in nature. A completed South Mountain loop is anticipated to divert through traffic from 51st Avenue.

2.2 Existing Lane Configurations

The existing pavement section on 51st Avenue consists of a two-lane rural section with a pavement width of 7.9m (26 ft) with two 3.65m (12 ft.) travel lanes and 0.3m (1 ft.) paved shoulders. At Dobbins Road, Baseline Road, Southern Avenue and Broadway Road, the intersection pavement widens to approximately 11.6m (38 ft.) to provide left turn lanes for northbound and southbound turning vehicles. The existing lane designation at study intersections is shown in Figure 2.2.1.

2.3 Study Area Intersections

The significant intersections within the study area were identified through field investigations, roadway classifications, accident reports and traffic counts. The intersections determined to be significant for this study and the access control measure at that intersection are as follows:

Intersection	Control Type
Pecos Road/51st Avenue (4-Leg)	Stop Signs on Pecos Road
St. Johns Road/51st Avenue (T)	Stop Sign on St. Johns Road
Dusty Lane/51st Avenue (T)	Stop Sign on Dusty Lane
Estrella Drive/51st Avenue (4-Leg)	Stop Signs on Estrella Drive
Elliot Road/51st Avenue (4-Leg)	Stop Signs on Elliot Road
Dobbins Road/51st Avenue (4-Leg)	4-Way Stop
Baseline Road/51st Avenue (4-Leg)	4-Way Stop
Southern Avenue/51st Avenue (4-Leg)	Traffic Signal
Broadway Road/51st Avenue (T)	Stop Sign on Broadway Road

2.4 Traffic Volumes

Traffic volume information was collected for roadways within the study area. Maricopa County DOT provided existing traffic volumes for significant roadway sections. The traffic information provided was a combination of MAG/MCDOT summary traffic counts and raw data from signal warrant studies. Field counts were also conducted that recorded turning movement counts during the AM (7:00-9:00) and PM (4:00-6:00) peak periods at five (5) study area intersections. Twenty-four (24) hour directional machine counts were conducted at twelve (12) locations throughout the study area.

2.5 Traffic Volume Adjustments

Seasonal fluctuations in traffic demand reflect the social and economic activity of the area being serviced by the roadway network. According to ITE's Traffic Engineering Handbook, travel patterns reveal that both commuter and business related travel occur in more uniform patterns than recreational travel, which is subject to the greatest variation among trip-purpose components of the traffic stream. Data provided by City of Phoenix staff revealed that the traffic counts conducted between April 29th and May 1st are 2% above the Annual Average Daily Traffic (AADT). The peak

51st AVENUE SAFETY IMPROVEMENT STUDY

Existing Intersection Geometry

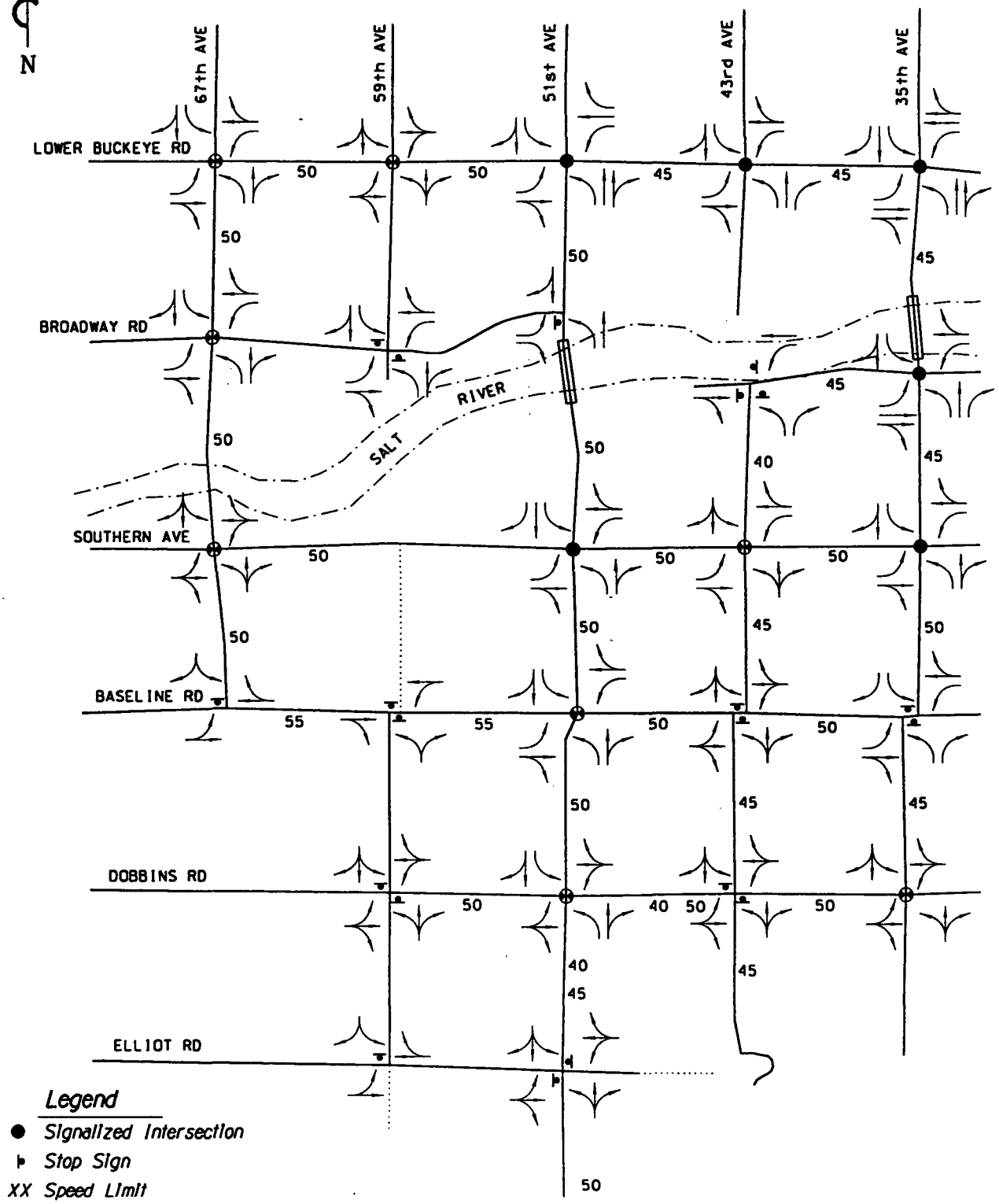


FIGURE 2.2.1

KIRKHAM MICHAEL

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season for the year, outlined in the City of Phoenix chart contained in the Appendix, is shown to be 4.5% above the AADT, which occurs in December.

Volume variations by day of the week also occur on roadways. The magnitude of daily variation is highest for recreational routes and least for urban commuter routes. The daily variation chart, provided by the City of Phoenix and contained in the Appendix, shows percent variation of Average Daily Traffic (ADT) for weekdays. The percent of ADT for each weekday is as follows:

Weekday	Percent of ADT
Monday	96%
Tuesday	98%
Wednesday	98%
Thursday	100%
Friday	100%

Peak hour turning movement volumes were adjusted to account for day of the week and month of the year variations. Turning movement counts were conducted on Wednesday, April 30, 1997 and Thursday, May 1, 1997. These peak hour counts were adjusted to peak season as shown in the following calculations:

Wednesday Count/0.98 (Weekday Adjustment) = ADT

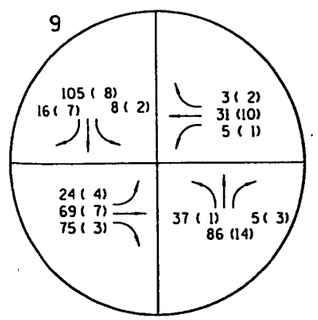
$$\text{ADT} * \frac{1.045\ \text{(Peak Season)}}{1.02\ \text{(May Adjustment)}} = \text{Peak Season ADT}$$

Wednesday Count * 1.0454 = Peak Season ADT

The Thursday count was adjusted using the same calculation technique; however, the Thursday day of the week adjustment factor is 1.00.

The 24 hour machine counts were also adjusted to peak season levels. These counts were conducted on Tuesday, April 29 - Thursday, May 1, 1997. The traffic volumes over the three day count were averaged by adding the three day volume totals together and dividing by 3. The day of week adjustment factors for the three days of the counts are 0.98, 0.98, and 1.0 for Tuesday, Wednesday, and Thursday. An average factor of 0.987 was used for the average traffic volume. The monthly adjustment factor of 1.02 was used for the month of May, and then the 1.04 factor was applied to raise volumes to peak season levels. The adjusted peak hour peak season turning movement volumes and daily traffic volumes are shown graphically in Figures 2.5.1-3.

51st AVENUE SAFETY IMPROVEMENT STUDY
1997 AM PEAK HOUR VOLUMES



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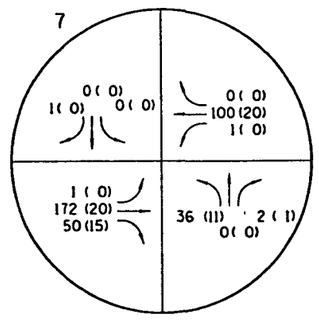

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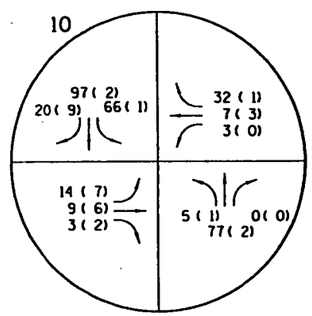

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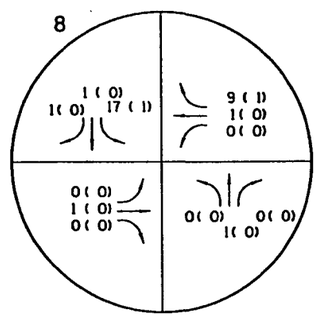

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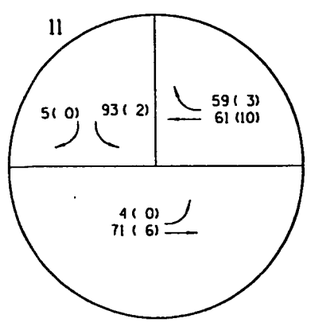

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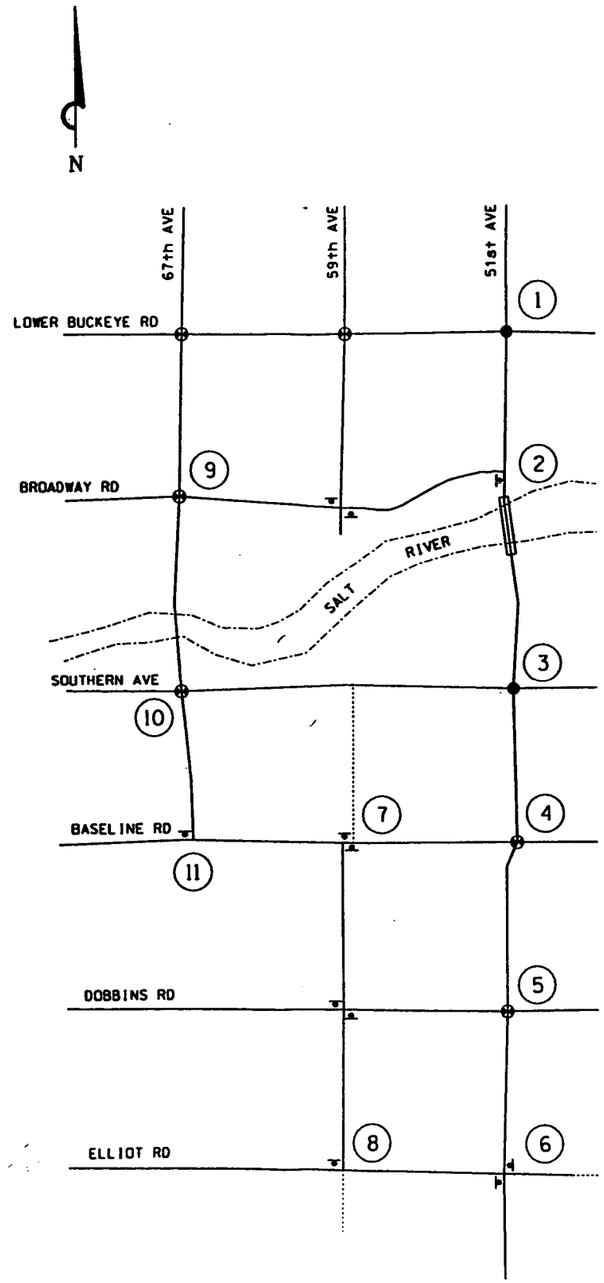
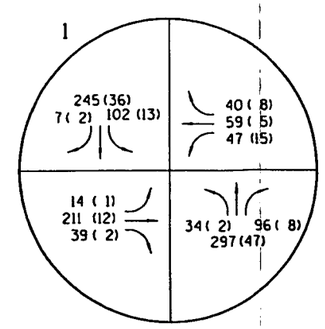


Legend

- ● *Signalized Intersection*
- *4 Way Stop*
- *Stop Sign*
- *Dirt Road*



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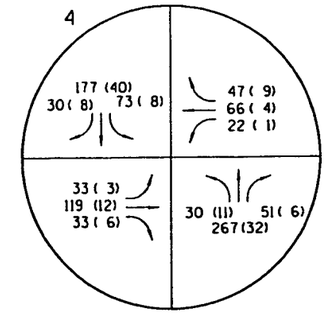

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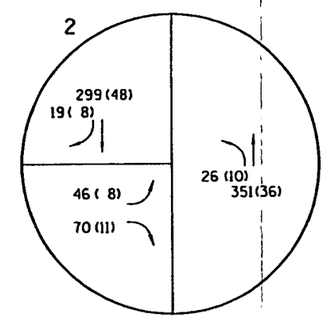

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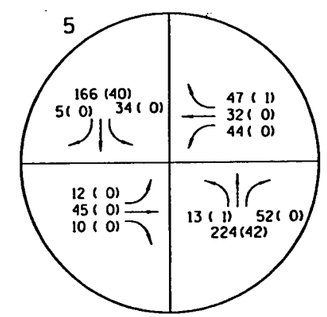

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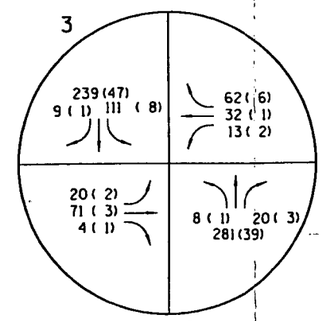

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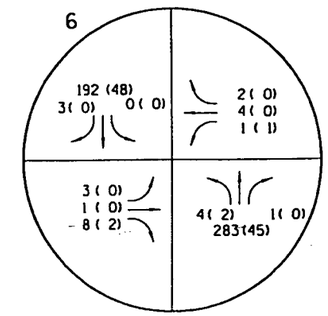

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% Trucks=19.6%

XX - 1997 Peak Season AM Peak Hour Traffic Volume without Casino Traffic

(XX) - 1997 Peak Season AM Peak Hour Truck Volume

NOTE: Turning movement counts were recorded on 51st Ave. on 5-1-97. Counts on 59th Ave. and 67th Ave. were recorded on 4-30-97.

FIGURE 2.5.1

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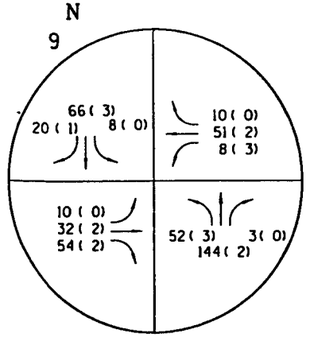
51st AVENUE SAFETY IMPROVEMENT STUDY
1997 PM PEAK HOUR VOLUMES



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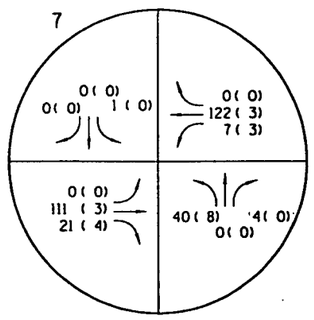

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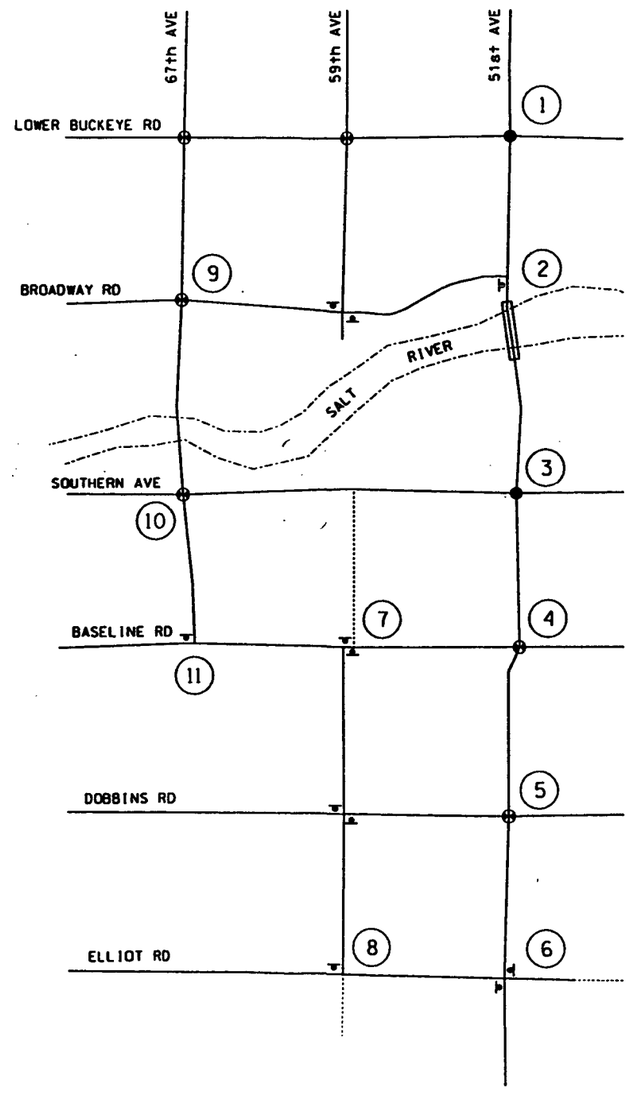

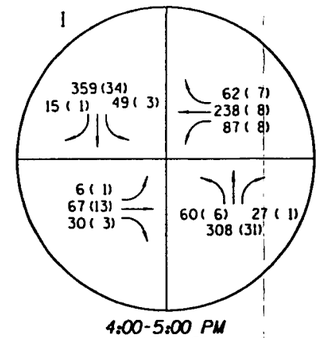

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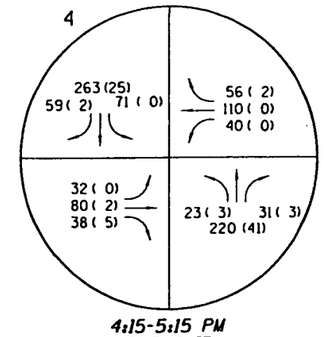

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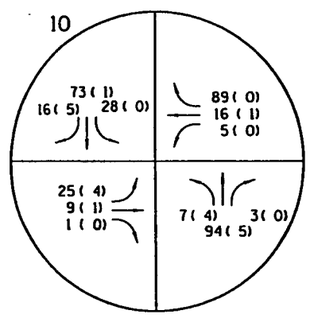

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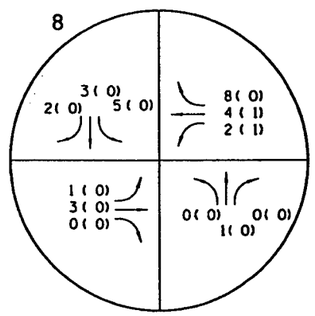

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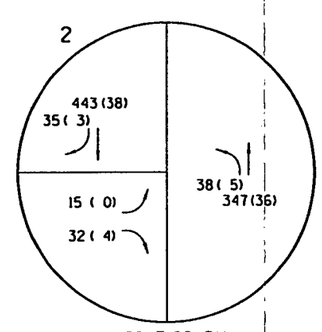

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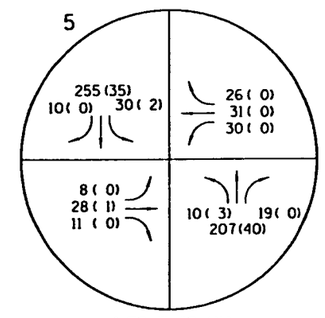

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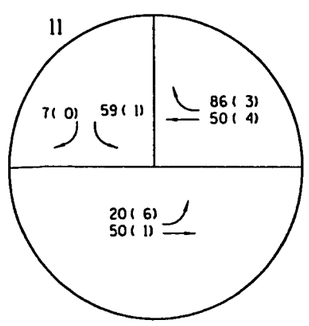

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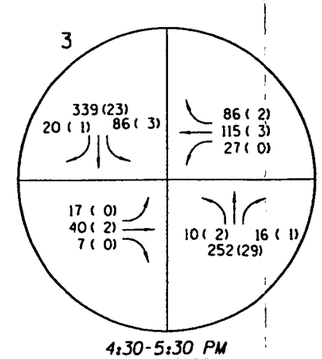

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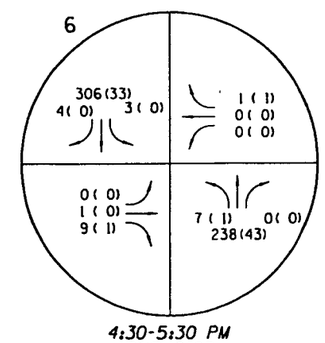

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PHF=0.93
% Trucks=13.9%

Legend

- ● *Signalized Intersection*
- ⊗ *4 Way Stop*
- ▸ *Stop Sign*
- ····· *Dirt Road*

XX - 1997 Peak Season PM Peak Hour Traffic Volume without Casino Traffic
(XX) - 1997 Peak Season PM Peak Hour Truck Volume

NOTE: 51st Ave Turning movement counts were recorded on 5-1-97. 59th Ave and 67th Ave Counts were recorded on 4-30-97.

FIGURE 2.5.2

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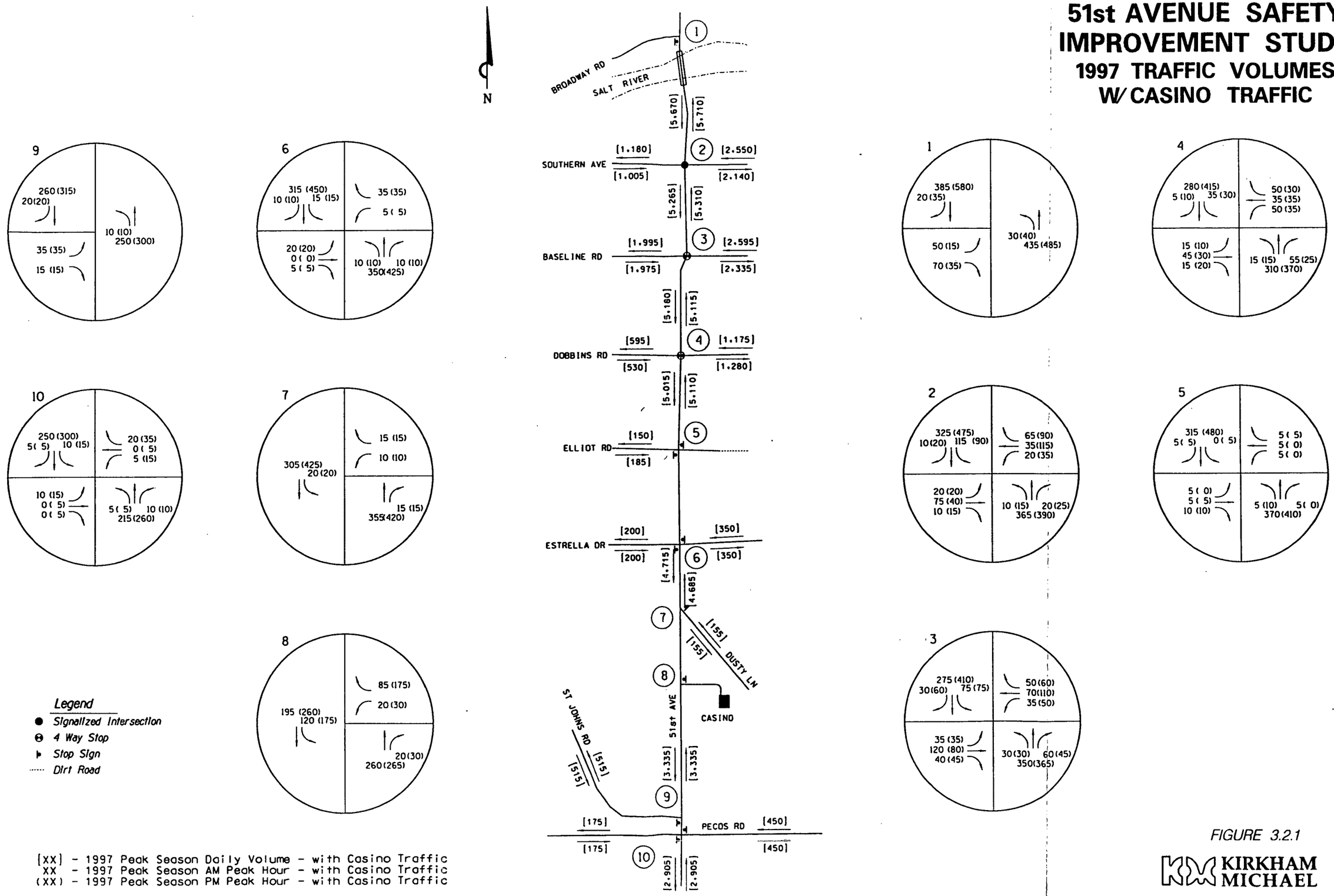
51st AVENUE SAFETY IMPROVEMENT STUDY
1997 TRAFFIC VOLUMES W/ CASINO TRAFFIC

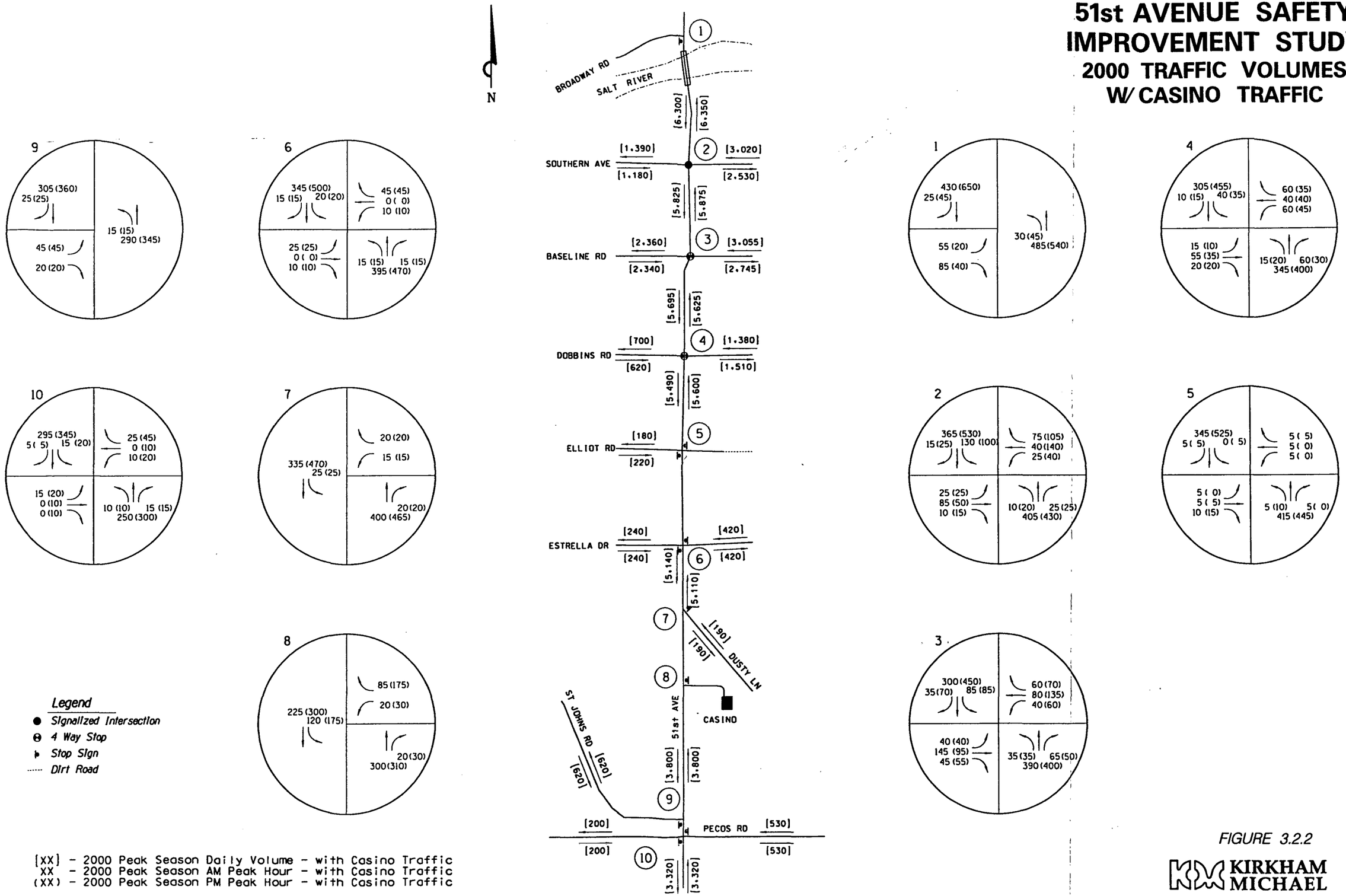


[XX] - 1997 Peak Season Daily Volume - with Casino Traffic
XX - 1997 Peak Season AM Peak Hour - with Casino Traffic
(XX) - 1997 Peak Season PM Peak Hour - with Casino Traffic

FIGURE 3.2.1

KIRKHAM MICHAEL

51st AVENUE SAFETY IMPROVEMENT STUDY
2000 TRAFFIC VOLUMES W/ CASINO TRAFFIC



[XX] - 2000 Peak Season Daily Volume - with Casino Traffic
XX - 2000 Peak Season AM Peak Hour - with Casino Traffic
(XX) - 2000 Peak Season PM Peak Hour - with Casino Traffic

FIGURE 3.2.2

KIRKHAM MICHAEL

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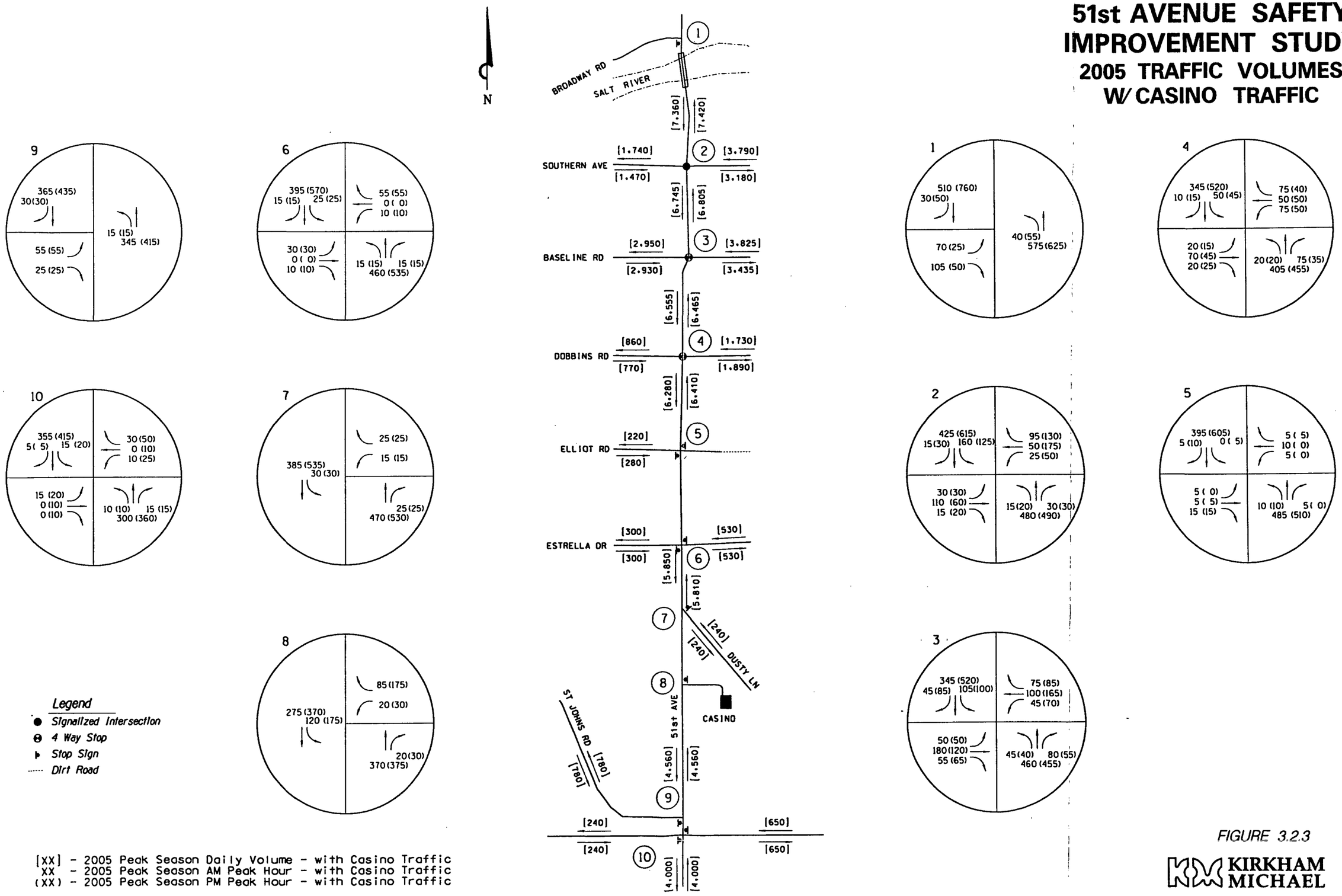
51st AVENUE SAFETY IMPROVEMENT STUDY
2005 TRAFFIC VOLUMES W/ CASINO TRAFFIC



[XX] - 2005 Peak Season Daily Volume - with Casino Traffic
XX - 2005 Peak Season AM Peak Hour - with Casino Traffic
(XX) - 2005 Peak Season PM Peak Hour - with Casino Traffic

FIGURE 3.2.3

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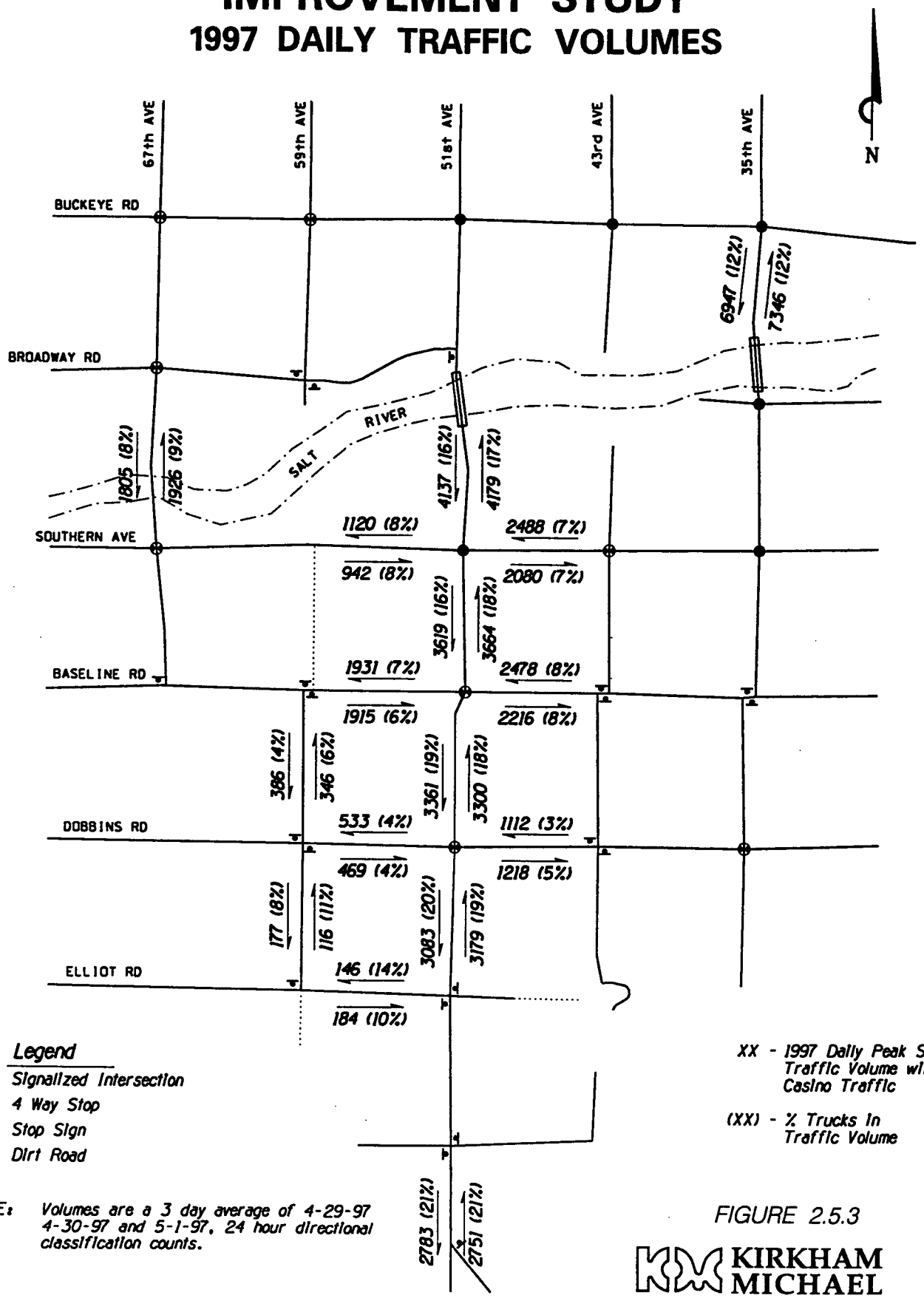
51st AVENUE SAFETY IMPROVEMENT STUDY
1997 DAILY TRAFFIC VOLUMES



Legend

- ● *Signalized Intersection*
- ⊖ *4 Way Stop*
- ▸ *Stop Sign*
- ····· *Dirt Road*

XX - 1997 Daily Peak Season Traffic Volume without Casino Traffic

(XX) - % Trucks in Traffic Volume

NOTE: Volumes are a 3 day average of 4-29-97 4-30-97 and 5-1-97, 24 hour directional classification counts.

FIGURE 2.5.3

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2.6 Vehicle Classification

The daily traffic counts conducted classified vehicles into 13 different categories. The vehicle classification count sheets are contained in the Appendix. For analysis reasons, the vehicle counts were divided into two groups: cars and trucks. Cars were counted as passenger cars, passenger cars pulling trailers, 2 axle long vehicles, and 2 axle - 6 tire vehicles. Vehicles classified as trucks in this report included:

1) Buses
2) 3 axle - single unit vehicles
3) 4 axle - single unit vehicles
4) < 5 axle - double unit vehicles
5) 5 axle - double unit vehicles
6) > 5 axle double unit vehicles
7) < 6 axle multi unit vehicles
8) 6 axle multi unit vehicles
9) > 6 axle multi unit vehicles

Figures 2.5.1-3 (referenced previously) graphically depict the total traffic and truck volumes for the AM and PM peak periods and the daily totals. In addition, they provide the percentage of heavy vehicles in the traffic streams for each location measured.

2.7 Existing Truck Volumes

The vehicles classified as trucks in this report were analyzed to determine if patterns in heavy vehicle traffic could be identified. The daily volume of truck traffic was compared to the total daily traffic volume on a roadway to determine the heavy vehicle percentage on study area roadways. The existing heavy vehicle percentages are shown in Table 2.7.1.

Table 2.7.1
Truck Percentage of Directional Traffic

Roadway	From	To	Percent Trucks	
			Northbound	Southbound
51st Avenue	Dusty Lane	Estrella Drive	21.08 %	20.66 %
51st Avenue	Estrella Drive	Dobbins Road	19.31 %	20.01 %
51st Avenue	Dobbins Road	Baseline Road	17.97 %	18.92 %
51st Avenue	Baseline Road	Southern Avenue	17.71 %	16.47 %
51st Avenue	Southern Avenue	Broadway Road	17.13 %	15.86 %

Table 2.7.1 cont.				
Roadway	**From**	**To**	**Eastbound**	**Westbound**
Elliot Road	51st Avenue	59th Avenue	9.78 %	13.70 %
Dobbins Road	43rd Avenue	51st Avenue	5.34 %	3.24 %
Dobbins Road	51st Avenue	59th Avenue	4.05 %	4.13 %
Baseline Road	43rd Avenue	51st Avenue	8.35 %	8.23 %
Baseline Road	51st Avenue	59th Avenue	6.48 %	7.41 %
Southern Avenue	43rd Avenue	51st Avenue	7.26 %	6.79 %
Southern Avenue	51st Avenue	59th Avenue	7.96 %	7.68 %

NOTE: Percentages are 3 day average of truck volume percentages in daily traffic stream.

The percentage/volume of trucks on 51st Avenue indicates that 51st Avenue is currently serving as a north/south truck route. Daily truck volumes were analyzed per hour of the day to examine daily variations in truck traffic. The daily truck volume variations for selected locations are shown in Figure 2.7.1.

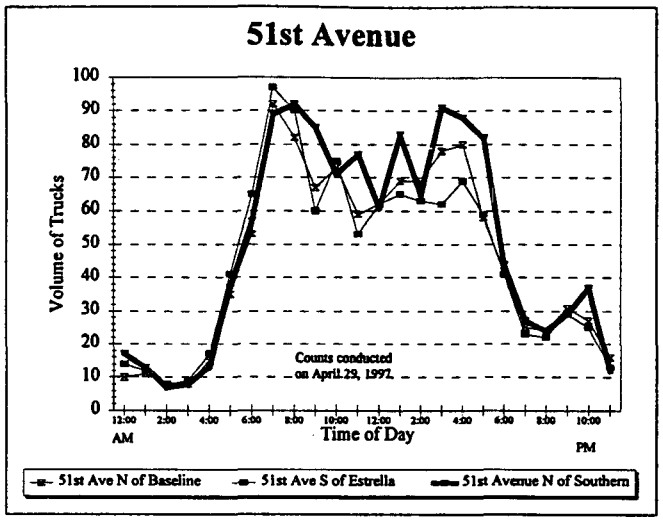
A review of the graphs of truck volumes per hour of the day reveals the following:

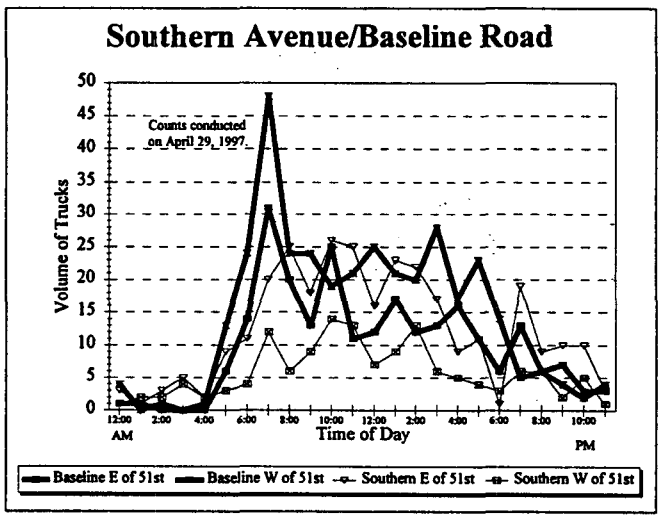
51st Avenue - Truck volumes at the north and south ends of the corridor are consistent for both peaking and volume characteristics. The peak hours of the truck volumes occur simultaneously with the roadway total traffic peak hours. (7-9:00 AM & 4-6:00 PM)

Elliot Road & Dobbins Road - Truck volumes are very low and are possibly attributed to area agricultural businesses.

Baseline Rd. & Southern Avenue - The east / west truck volumes are anticipated to be serving local area businesses or agricultural needs.

1997 Truck Volumes





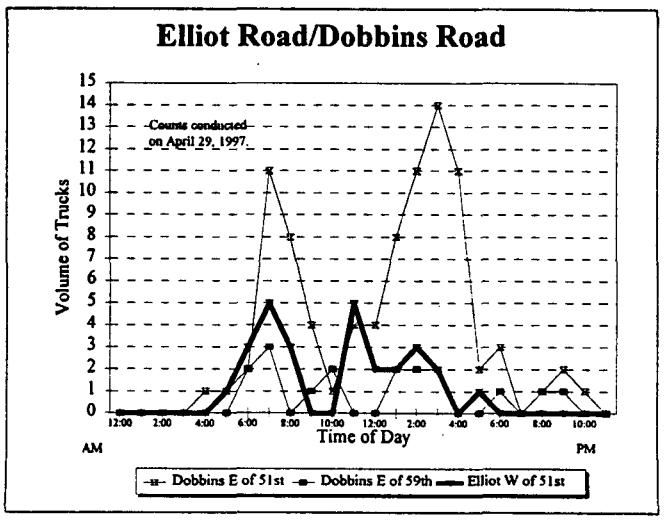


Figure 2.7.1

3.0 FUTURE TRAFFIC VOLUMES

3.1 Casino Traffic

A casino is planned on the Gila River Indian Community that will have exclusive access to 51st Avenue through a major driveway south of Dusty Lane. The West End Casino is anticipated to be completed by November 1997. A review of the Preliminary Traffic Impact Study for the West End Casino by Cella Barr Associates, Inc., (dated 2/19/97) was conducted. The traffic anticipated from the casino was determined to be 4,534 daily trips with 65% having origins north of Dusty Lane and 35% south of Dusty Lane. A review of the development in the surrounding areas and the proximity of other casinos to this proposed casino site led to the reassignment of casino project traffic. The assignment of casino project traffic was determined to have 85% of its traffic having origins or destinations to and from the north, and 15% to and from the south. The percentage assignment for the casino traffic is shown graphically in Figure 3.1.1.

3.2 Area Growth Rate

Based on the historical development rate of the area, the predominately agricultural nature of the property adjacent to 51st Avenue, and planned area developments, a growth rate was calculated for 51st Avenue and the major cross roads. Historic traffic volumes were obtained from Maricopa County Department of Transportation. The traffic volumes were provided via the *MCDOT Traffic Counts Program 1995 Annual Report* and *1996 Annual Report*. The 1996 report has not been distributed; however, MCDOT staff provided the 1996 traffic volumes for study area roadways. The 1996 traffic volumes were compared to the 1995 historical traffic volumes on the north/south and east/west section line roadways. The calculation of east/west and north/south growth rates is shown in Table 3.2.1.

The growth rates calculated in Table 3.2.1 reveal that the north/south roads are increasing at 5.1% per year (average) and the east/west roadways at 6.2% based on a straight line growth rate calculation. The 5.1% and 6.2% growth rates are the average annual increases from 1991 to 1997. This rate was applied to the adjusted 1997 volumes to generate year 2000 and 2005 peak season traffic volumes.

51st AVENUE SAFETY IMPROVEMENT STUDY
CASINO TRAFFIC DISTRIBUTION

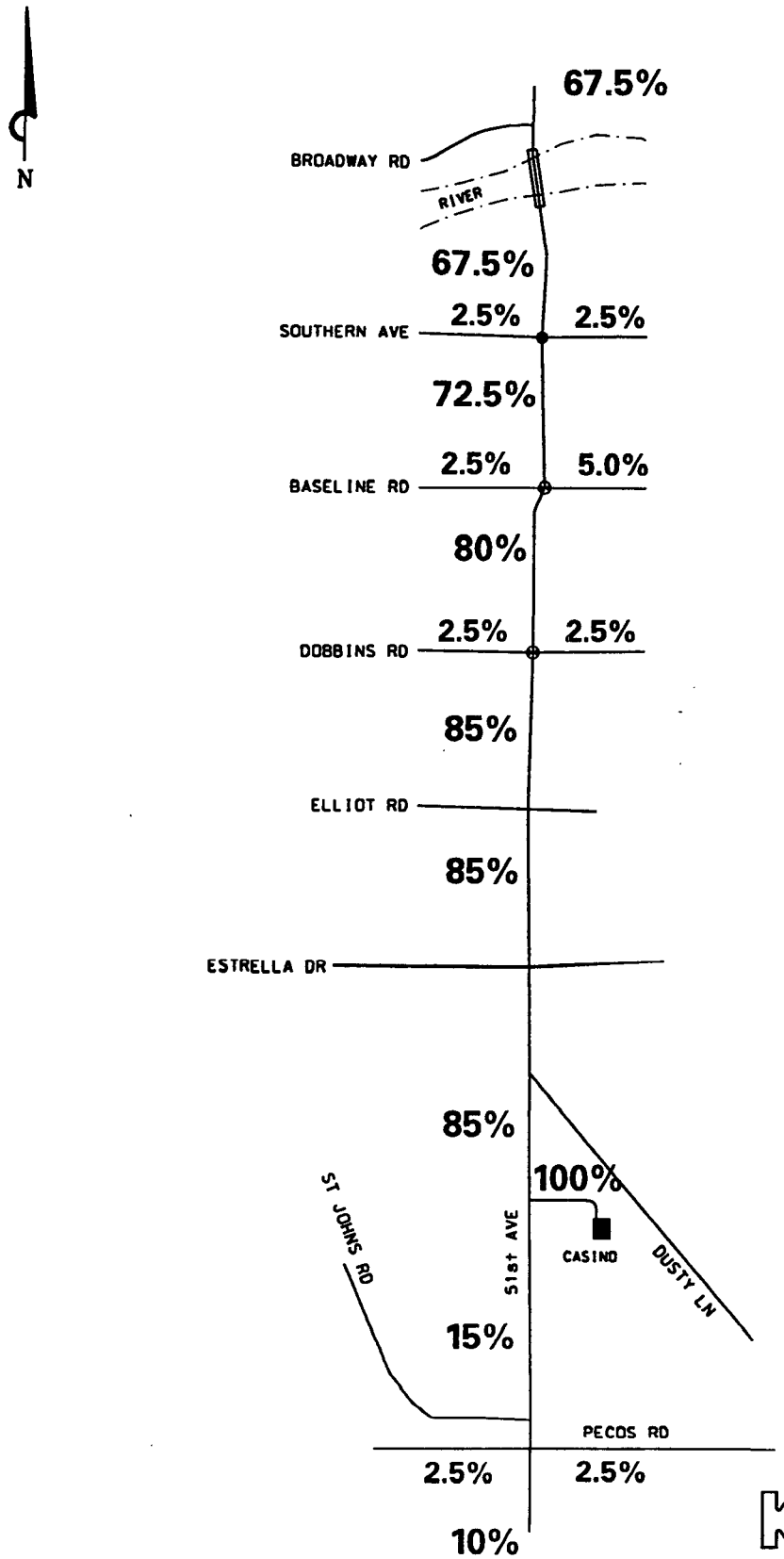


FIGURE 3.1.1

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TABLE 3.2.1
Area Growth Rate

Roadway	Location	2-Way ADT 1997	2-Way ADT 1991	Percent Change
North/South Roadways				
51st Avenue	North of Baseline Road	7,283	7,328	-.10%
51st Avenue	North of Dobbins Road	6,661	5,238	4.53%
51st Avenue	North of Elliot Road	6,262	3,993	9.47%
51st Avenue	North of Southern Avenue	8,316	7,356	2.18%
59th Avenue	North of Dobbins Road	732	467	9.46%
	North/South Annual Growth Average			5.1%
East/West Roadways				
Baseline Road	East of 59th Avenue	3,750	1,877	16.63%
Baseline Road	West of 43rd Avenue	4,694	5,050	-1.17%
Dobbins Road	East of 59th Avenue	1,002	656	8.79%
Dobbins Road	East of 43rd Avenue	2,330	1,935	3.40%
Elliot Road	East of 59th Avenue	330	155	18.82%
Southern Avenue	East of 59th Avenue	2,062	2,096	-0.27%
Southern Avenue	East of 43rd Avenue	4,568	5,529	-2.90%
	East/West Annual Growth Average			6.2%

NOTE: Growth Rate calculated using straight line method.

The casino traffic volumes resulting from the distribution shown in Figure 3.1.1 were added to the 1997, 2000 and 2005 projections. The resulting 1997, 2000 and 2005 peak season traffic volumes (with casino traffic) are shown graphically in Figures 3.2.1-3.

Traffic model forecast volumes for year 2010 were conducted by MCDOT staff utilizing updated socio-economic data. The socio-economic data did not include the West End Casino in its land use assumption data file. The 2010 forecast was evaluated based on the South Mountain Loop being constructed with and without a bridge crossing at the Salt River. Casino traffic volumes were added to the 2010 projected traffic volumes and are shown graphically in Figure 3.2.4.

The traffic volumes analyzed in this analysis were limited to 1997, 2000, 2005 and 2010. Year 2020 traffic volumes were generated and analyzed as part of a Truck Study on 51st Avenue. For these traffic volume projections and analysis, refer to the 51st Avenue Truck Study conducted by Kirkham Michael.

51st AVENUE SAFETY IMPROVEMENT STUDY

2010 TRAFFIC VOLUMES W/CASINO TRAFFIC

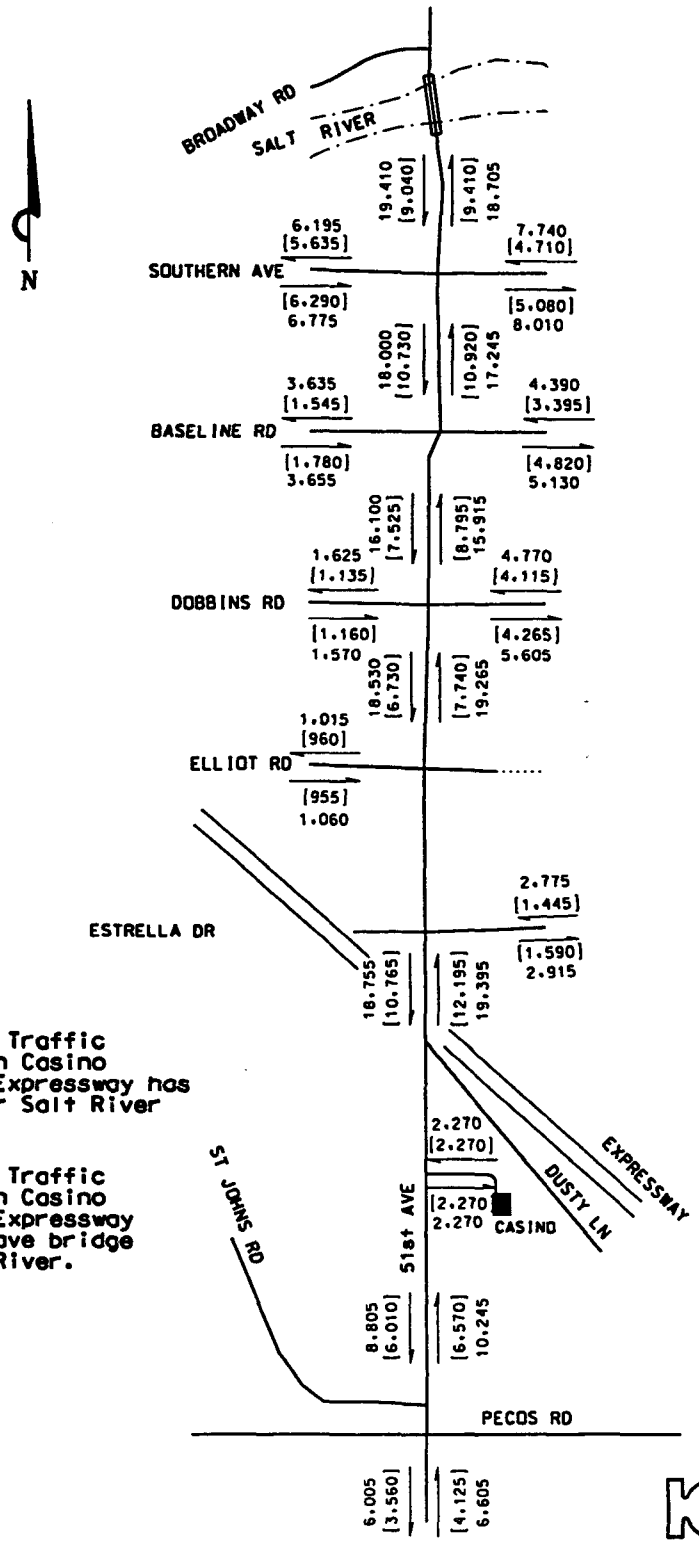

FIGURE 3.2.4

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4.0 PLANNING LEVEL TRAFFIC ANALYSIS

4.1 Capacity Analysis

The projected traffic volumes were analyzed to determine future operating conditions. The level of service analysis for project intersections was conducted based on the 1994 update of the *Highway Capacity Manual*. The level of service criteria for all-way stop controlled (AWSC) and two-way stop controlled (TWSC) intersections is as follows:

Level of Service	Average Total Delay (sec/veh)
A	≤5
B	>5 and ≤10
C	>10 and ≤20
D	>20 and ≤30
E	>30 and ≤45
F	>45 and

The results of the intersection level of service analysis for existing geometry are summarized in Table 4.1.1.

TABLE 4.1.1
Intersection Level of Service Analysis
with Existing Geometry

Intersection	1997		2000		2005	
	AM	PM	AM	PM	AM	PM
51st Ave. & Pecos Rd.	A	A	A	A	A	A
51st Ave. & St. Johns Rd.	A	A	A	A	A	A
51st Ave. & Casino Entrance	A	A	A	A	A	A
51st Ave. & Dusty Ln.	A	A	A	A	A	A
51st Ave. & Estrella Dr.	A	A	A	A	A	A
51st. Ave. & Elliot Rd.	A	A	A	A	A	A
51st Ave. & Dobbins Rd.	B	B	B	B	C	F
51st Ave. & Baseline Rd.	B	F	F	F	F	F
51st Ave. & Southern Ave.	B	B	B	B	B*	B
51st Ave. & Broadway Rd.	A	A	A	A	A	A

* With the installation of left-turn phase on signal. NOTE: Traffic volumes analyzed include casino traffic and are peak season volumes. Casino entrance includes construction of southbound left turn lane on 51st Avenue.

The intersections of Dobbins Road and Baseline Road with 51st Avenue are currently four-way stop controlled intersections. The analysis of the additional traffic anticipated from the proposed casino south of Dusty Lane revealed that heavy delays are anticipated to occur under four-way stop controlled conditions by year 2005 at the Baseline Road and Dobbins Road intersections with 51st Avenue.

Mitigation of these heavy delays may be accomplished through signalization. **A signal warrant analysis is recommended to be conducted on 51st Avenue at Baseline Road and Dobbins Road upon the opening of the casino. An investigation of the Baseline Road/51st Avenue intersection revealed that this intersection is currently just below signal warrants. The addition of casino traffic to this intersection is anticipated to meet the signal warrant threshold volumes. See also Section 4.3 on page 27.**

The planned improvements to 51st Avenue from the low cost alternative were evaluated with the projected traffic volumes. The low cost and high cost intersection geometry is shown graphically in Figures 4.1.1 and 4.1.2. The peak hour turning volumes were evaluated at study intersections with geometric improvements based on the Highway Capacity Manual. An intersection level of service analysis with the proposed geometry and existing traffic control was performed and is summarized in Table 4.1.2.

TABLE 4.1.2
Year 2005 Intersection Level of Service
Proposed Geometry & Existing Traffic Control (Low Cost)

Intersection	Level of Service		Existing Traffic Control
	AM	PM	
51st Ave./Dusty Ln.	A	A	Stop on Dusty Lane
51st Ave./Estrella Dr.	A	A	Stop on Estrella Drive
51st Ave./Elliot Rd.	A	A	Stop on Elliot Road
51st Ave./Dobbins Rd.	B	F	All-Way Stop
51st Ave./Baseline Rd.	F	F	All-Way Stop
51st Ave./Southern Ave.	B	B	Traffic Signal
51st. Ave./Broadway Rd.	A	A	Stop on Broadway Road

51st AVENUE SAFETY IMPROVEMENT STUDY

2005 IMPROVED LANE GEOMETRY - LOW COST

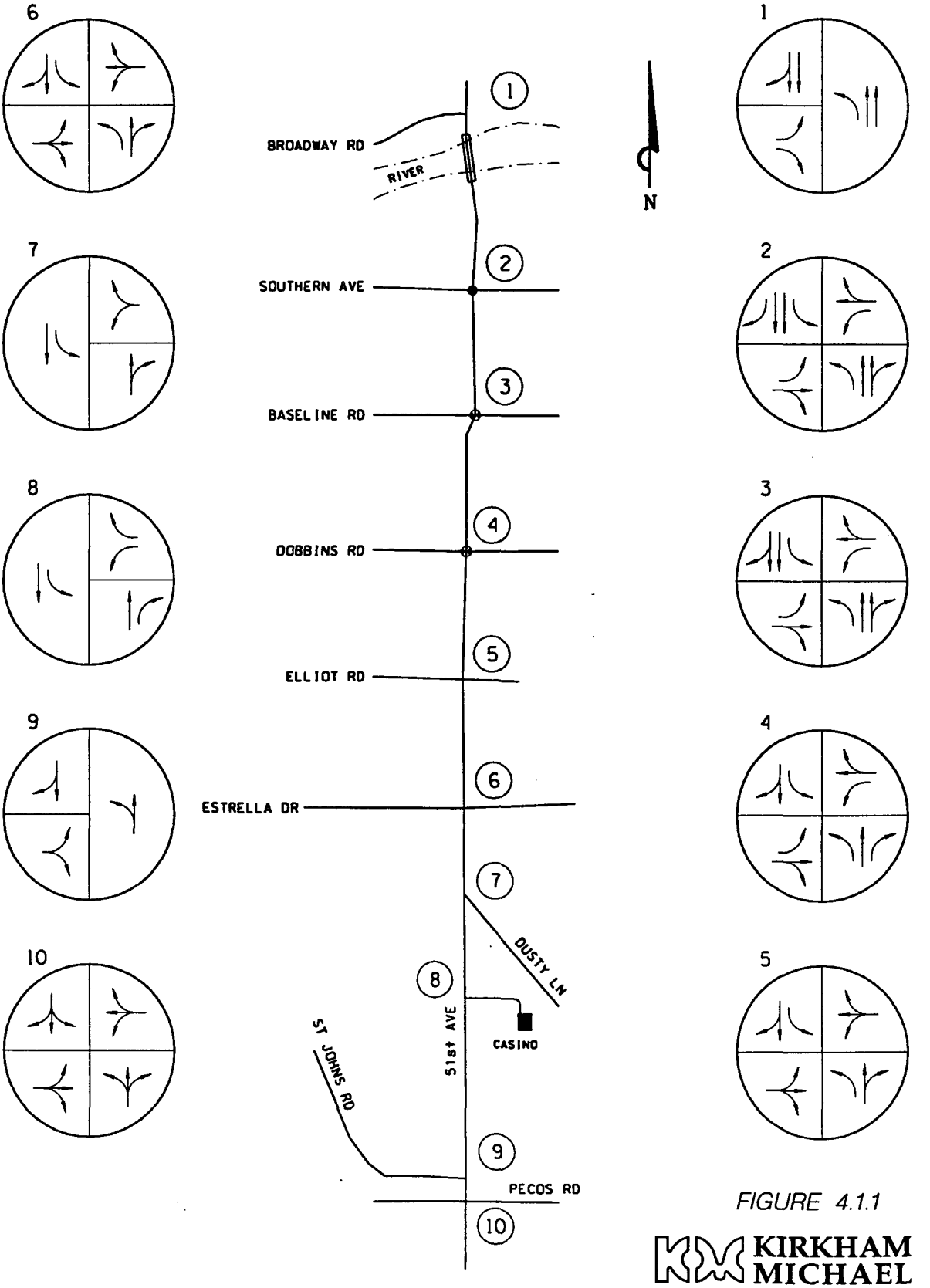

FIGURE 4.1.1

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51st AVENUE SAFETY IMPROVEMENT STUDY

2005 IMPROVED LANE GEOMETRY - HIGH COST

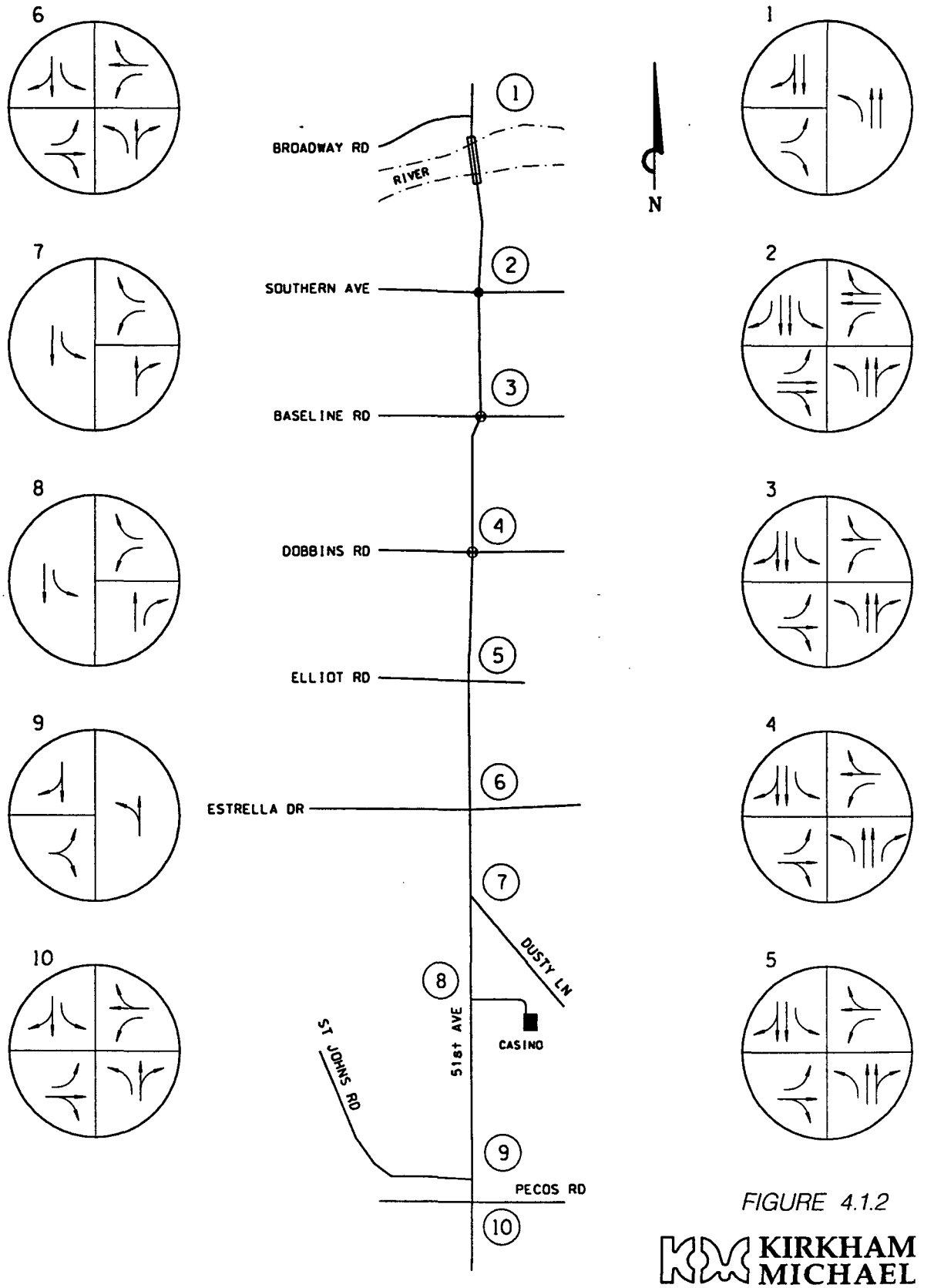

FIGURE 4.1.2

KIRKHAM MICHAEL

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4.2 Daily Traffic Capacity Analysis

The daily traffic volumes assigned to the study area roadway network were analyzed to determine the necessary lane configurations for the projected volumes. The projected volumes are peak season daily traffic volumes with casino traffic on the existing roadway network and the improved 51st Ave.

The projected 1997, 2000, 2005 and 2010 volumes were analyzed on the significant roadway links. The existing roadway geometry analysis was analyzed as Alternative A, while the improved geometry was analyzed as Alternative B. The planned improvements to 51st Avenue include widening to four vehicle travel lanes between Broadway Road and Baseline Road and widening to a three lane section from Baseline Road to Elliot Road. Other improvements currently planned include widening Baseline Road to four lanes east of 51st Avenue. The MCDOT Roadway Design Manual, 1993, provides the design capacity for roadway cross sections. The design capacity volume for a two lane road is 8,000 vpd and for a four lane road is 22,000 vpd. The three lane section capacity was calculated to be 20% greater than the two lane section capacity (9,600 vpd = 8,000*1.2). The timing of improvements to 51st Avenue and Baseline Road would not occur before year 2000; therefore analysis of 1997 capacity with improved geometry was not conducted. The results of the capacity analysis are shown in Table 4.2.1.

The projected daily traffic volumes were analyzed based on a peak season Average Daily Traffic (ADT) with casino traffic. The capacity analysis of the existing roadway network reveals that 51st Avenue traffic volumes will be over its roadway capacity between Broadway Road and the casino access to 51st Avenue upon completion of the casino. The analysis of projected volumes on the improved roadway network reveals that 51st Avenue would be over capacity between Baseline Road and the casino by 2000 and over capacity between Baseline Road and Pecos Road by 2005. The analysis also revealed that if a bridge is not constructed over the Salt River concurrent with the Expressway construction, 51st Avenue will be over capacity between Broadway Road and Pecos Road by 2010. The construction of the bridge is anticipated to reduce 2010 traffic volumes significantly in the 51st Avenue Corridor. The roadway links of Southern Avenue between 43rd Avenue and 59th Avenue and Dobbins Road from 43rd Avenue to 51st Avenue are projected to be over their capacity by year 2010 based on the existing geometry and projected volumes in the study area.

Improvements to 51st Avenue are planned to widen the section between Baseline Road and Broadway Road to four lanes and between Elliot Road and Baseline Road to a three lane section. The widening of 51st Avenue is anticipated to address capacity problems on 51st Avenue. The year 2000 traffic volumes, with improved 51st Avenue geometry, are still anticipated to be above the roadway capacity of 51st Avenue between Baseline Road and the casino entrance south of Dusty Lane.

The potential construction of a truck route bypass of the section of 51st Avenue between Dusty Lane and Southern Avenue along the 59th Avenue alignment would reduce volumes on 51st Avenue to below capacity thresholds. MCDOT is currently evaluating the truck route as a separate project.

Baseline Road is planned to be improved east of 51st Avenue to a four lane section. This widening will mitigate capacity problems in 2010 for the section of Baseline Road east of 51st Avenue.

TABLE 4.2.1
ADT Analysis

Alt A - Peak Season Daily Traffic Volumes - Includes Casino Traffic and Existing Geometry in the 51st Avenue Corridor

Roadway	From	To	Number of Lanes	1997 Pk Season Daily Volume		2000 Pk Season Daily Volume		2005 Pk Season Daily Volume	
				Daily Volume	Over Capacity?	Daily Volume	Over Capacity?	Daily Volume	Over Capacity?
North/South Counts									
51st Avenue	S. of Pecos Rd	Pecos Road	2	5,810	-	6,640	-	8,000	-
51st Avenue	Pecos Road	Casino Entrance	2	6,670	-	7,600	-	9,120	Yes
51st Avenue	Casino Entrance	Estrella Drive	2	9,400	Yes	10,250	Yes	11,660	Yes
51st Avenue	Estrella Drive	Dobbins Road	2	10,125	Yes	11,090	Yes	12,690	Yes
51st Avenue	Dobbins Road	Baseline Road	2	10,295	Yes	11,320	Yes	13,020	Yes
51st Avenue	Baseline Road	Southern Avenue	2	10,575	Yes	11,700	Yes	13,550	Yes
51st Avenue	Southern Avenue	Broadway Road	2	11,380	Yes	12,650	Yes	14,780	Yes
East/West Counts									
Pecos Road	W of 51st Avenue	51st Avenue	2	350	-	400	-	480	-
Pecos Road	51st Avenue	E of 51st Avenue	2	900	-	1,060	-	1,300	-
St Johns Road	W of 51st Avenue	51st Avenue	2	1,030	-	1,240	-	1,560	-
Dusty Lane	51st Avenue	E of 51st Avenue	2	310	-	380	-	480	-
Estrella Drive	W of 51st Avenue	51st Avenue	2	400	-	480	-	600	-
Estrella Drive	51st Avenue	E of 51st Avenue	2	700	-	840	-	1,060	-
Elliot Road	51st Avenue	59th Avenue	2	335	-	400	-	500	-
Dobbins Road	43rd Avenue	51st Avenue	2	2,455	-	2,890	-	3,620	-
Dobbins Road	51st Avenue	59th Avenue	2	1,125	-	1,320	-	1,630	-
Baseline Road	43rd Avenue	51st Avenue	2	4,930	-	5,800	-	7,260	-
Baseline Road	51st Avenue	59th Avenue	2	3,970	-	4,700	-	5,880	-
Southern Avenue	43rd Avenue	51st Avenue	2	4,690	-	5,550	-	6,970	-
Southern Avenue	51st Avenue	59th Avenue	2	2,185	-	2,570	-	3,210	-

Note: Volumes are two-directional daily volumes. Capacity 2 Lane Road = 8,000. Capacity Volumes per MCDOT Roadway Design Manual.

Alt B - Peak Season Daily Traffic Volumes - Includes Casino Traffic, Improved Geometry on 51st Avenue, and Expressway by Year 2010.

Roadway	From	To	Number of Lanes	2000 Pk Season Daily Volume		2005 Pk Season Daily Volume		2010 Daily Volume w/ Bridge		2010 Daily Volume w/o Bridge	
				Daily Volume	Over Capacity?	Daily Volume	Over Capacity?	Daily Volume	Over Capacity?	Daily Volume	Over Capacity?
North/South Counts											
51st Avenue	S. of Pecos Rd	Pecos Road	2	6,640	-	8,000	-	7,685	-	12,610	Yes
51st Avenue	Pecos Road	Casino Entrance	2	7,600	-	9,120	Yes	12,580	Yes	19,050	Yes
51st Avenue	Casino Entrance	Estrella Drive	2	10,250	Yes	11,660	Yes	22,960	Yes	38,150	Yes
51st Avenue	Estrella Drive	Dobbins Road	3	11,090	Yes	12,690	Yes	14,470	Yes	37,795	Yes
51st Avenue	Dobbins Road	Baseline Road	3	11,320	Yes	13,020	Yes	16,320	Yes	32,015	Yes
51st Avenue	Baseline Road	Southern Avenue	4	11,700	-	13,550	-	21,650	-	35,245	Yes
51st Avenue	Southern Avenue	Broadway Road	4	12,650	-	14,780	-	18,450	-	38,115	Yes
East/West Counts											
Pecos Road	W of 51st Avenue	51st Avenue	2	400	-	480	-		-		-
Pecos Road	51st Avenue	E of 51st Avenue	2	1,060	-	1,300	-		-		-
St Johns Road	W of 51st Avenue	51st Avenue	2	1,240	-	1,560	-		-		-
Dusty Lane	51st Avenue	E of 51st Avenue	2	380	-	480	-		-		-
Estrella Drive	W of 51st Avenue	51st Avenue	2	480	-	600	-		-		-
Estrella Drive	51st Avenue	E of 51st Avenue	2	840	-	1,060	-	3,035	-	5,690	-
Elliot Road	51st Avenue	59th Avenue	2	400	-	500	-	1,915	-	2,075	-
Dobbins Road	43rd Avenue	51st Avenue	2	2,890	-	3,620	-	8,380	Yes	10,375	Yes
Dobbins Road	51st Avenue	59th Avenue	2	1,320	-	1,630	-	2,295	-	3,195	-
Baseline Road	43rd Avenue	51st Avenue	4	5,800	-	7,260	-	8,215	-	9,520	-
Baseline Road	51st Avenue	59th Avenue	2	4,700	-	5,880	-	3,325	-	7,290	-
Southern Avenue	43rd Avenue	51st Avenue	2	5,550	-	6,970	-	9,790	Yes	15,750	Yes
Southern Avenue	51st Avenue	59th Avenue	2	2,570	-	3,210	-	11,925	Yes	12,970	Yes

Note: Volumes are two-directional daily volumes. Capacity 2 Lane Road = 8,000, 3 Lane Road = 9,600, 4 Lane Road = 22,000 vpd. Capacity Volumes per MCDOT Roadway Design Manual (3 Lane = 2 Lane * 1.20).

- Improvements on 51st Avenue include 4-Lane roadway from Broadway Rd to Baseline Road and 3-Lane roadway from Baseline Road to Elliot Road. - Reference to bridge refers to a bridge crossing at the Salt River for the proposed Expressway.

Year 2020 traffic volumes on 51st Avenue were projected and analyzed as part of a separate report. These 2020 daily volumes and the roadway capacity evaluation of the daily traffic volumes is contained in the 51st Avenue Truck Route Analysis.

The projected traffic volumes on the roadway links on 51st Avenue that are shown as over design capacity in Table 4.2.1 were analyzed to estimate the anticipated levels of service in 2005 and 2010. The future levels of service on these roadway links are shown in Table 4.2.2.

TABLE 4.2.2
51st Avenue Roadway Links Projected Level of Service

From	To	Number of Lanes	Year 2005		Yr. 2010 w/ Bridge		Yr. 2010 w/o Bridge	
			Daily Vol.	LOS	Daily Vol.	LOS	Daily Vol.	LOS
S. of Pecos Rd.	Pecos Rd.	2	8000	C	7685	C	12610	D
Pecos Rd.	Casino Entrance	2	9120	C	12580	D	19050	E
Casino Entrance	Estrella Dr.	2	11660	C	22960	E	38150	F
Estrella Dr.	Dobbins Rd.	3	12690	C	14770	D	37795	F
Dobbins Rd.	Baseline Rd.	3	13020	C	16320	D	32015	E
Baseline Rd.	Southern Ave.	4	13550	A	21650	B	35245	D
Southern Ave.	Broadway Rd.	4	14780	B	18450	B	38115	E

* Per AASHTO Geometric Design of Highways and Streets, 1994, p 88-89.

A review of the projected levels-of-service on 51st Avenue revealed that a reevaluation may be necessary by 2005 to determine if additional geometric improvements are warranted.

4.3 Traffic Signal Evaluation

Traffic signal installation is based on a number of criteria outlined in the *Manual on Uniform Traffic Control Devices* (MUTCD). The installation of a traffic signal should be based on information obtained by means of traffic engineering studies and compared with the requirements set forth in the warrants. The traffic engineering study should indicate that the installation of a traffic signal will improve the overall safety and/or operation of the intersection.

An analysis of projected traffic volumes was conducted at major study intersections to determine when signal warrants are anticipated to be met. The projected traffic volumes were evaluated based on the daily traffic volume warrants outlined in a planning tool provided by MCDOT's Traffic Engineering. The volume warrant calculations (Table 4.3.1) and criteria are provided in the Appendix.

The daily volume analysis revealed that the intersection of Baseline Road with 51st Avenue is anticipated to meet MUTCD signal warrants by year 2002. It is recommended that a traffic signal be installed at this location when traffic volumes satisfy signal warrants. Traffic volumes on Dobbins Road at 51st Avenue are anticipated to be close to satisfying signal warrants based upon traffic projections. However, if a truck route would be constructed that will bypass both the Baseline Road

TABLE 4.3.1 - Combined Signal Warrant Evaluation

Intersection	Year	Number of Lanes		Warrant Volume Minor Street		Minor Street Approach Vol	Warrant Volume Major Street		Major Street Both	Warrant #1 Met?	Warrant #2 Met?
		Major	Minor	#1	#2	(vpd)	#1	#2	Approaches		
Pecos Rd.	1997	1	1	3,000	1,500	450	10,000	15,000	6,240	-	-
& 51st Avenue	2000	1	1	3,000	1,500	530	10,000	15,000	7,120	-	-
	2005	1	1	3,000	1,500	650	10,000	15,000	8,560	-	-
St Johns Rd.	1997	1	1	3,000	1,500	515	10,000	15,000	6,670	-	-
& 51st Avenue	2000	1	1	3,000	1,500	620	10,000	15,000	7,600	-	-
	2005	1	1	3,000	1,500	780	10,000	15,000	9,120	-	-
Casino Entrance	1997	1	1	3,000	1,500	2,270	10,000	15,000	8,050	-	-
& 51st Avenue	2000	1	1	3,000	1,500	2,270	10,000	15,000	8,940	-	-
	2005	1	1	3,000	1,500	2,270	10,000	15,000	10,410	-	-
Dusty Lane	1997	1	1	3,000	1,500	155	10,000	15,000	9,400	-	-
& 51st Avenue	2000	1	1	3,000	1,500	190	10,000	15,000	10,250	-	-
	2005	1	1	3,000	1,500	240	10,000	15,000	11,660	-	-
Estrella Dr.	1997	1	1	3,000	1,500	350	10,000	15,000	9,700	-	-
& 51st Avenue	2000	1	1	3,000	1,500	420	10,000	15,000	10,600	-	-
	2005	1	1	3,000	1,500	530	10,000	15,000	12,090	-	-
Elliot Rd.	1997	1	1	3,000	1,500	185	10,000	15,000	10,125	-	-
& 51st Avenue	2000	1	1	3,000	1,500	220	10,000	15,000	11,090	-	-
	2005	1	1	3,000	1,500	280	10,000	15,000	12,690	-	-
Dobbins Rd.	1997	1	1	3,000	1,500	1,175	10,000	15,000	10,290	-	-
& 51st Avenue	2000	1	1	3,000	1,500	1,380	10,000	15,000	11,295	-	-
	2005	1	1	3,000	1,500	1,730	10,000	15,000	12,965	-	-
Baseline Rd.	1997	1	1	3,000	1,500	2,595	10,000	15,000	10,380	-	-
& 51st Avenue	2000	2	1	3,000	1,500	3,055	12,000	18,000	11,450	*	-
	2005	2	1	3,000	1,500	3,825	12,000	18,000	13,210	YES	-
Broadway Rd.	1997	1	1	3,000	1,500	500	10,000	15,000	11,380	-	-
& 51st Avenue	2000	2	1	3,000	1,500	595	12,000	18,000	12,650	-	-
	2005	2	1	3,000	1,500	750	12,000	18,000	14,780	-	-
Combined Pecos	1997	1	1	3,000	1,500	690	10,000	15,000	6,240	-	-
Rd. & St Johns	2000	1	1	3,000	1,500	820	10,000	15,000	7,120	-	-
Rd. @ 51st Ave	2005	1	1	3,000	1,500	1,020	10,000	15,000	8,560	-	-

Note: Traffic volumes are in vehicles per day. Traffic signal volume warrants provided by MCDOT Planning Department.

* Traffic Volume close to meeting signal warrant.

and Dobbins Road intersections with 51st Avenue, traffic volumes could fall below signal warrants. Traffic volume analysis of the Dobbins Road/51st Avenue intersection (shown in Table 4.3.1) revealed that the intersection is below signal warrants for analysis years. Additional analyses of historical traffic volumes on Dobbins Road were conducted based on traffic counts conducted at the 51st Avenue intersection approach for a signal warrant study conducted by MCDOT in 1996 and a count conducted by KM in 1997.

A comparison of these volumes revealed the following:

Description	Location	Daily Count
KM 1997 count	Dobbins Rd. E. of 51st Ave.	2,330 vpd
MCDOT 1996 Signal Study	Dobbins Rd. E. of 51st Ave.	1,551 vpd
	1 Year Growth = 50.2%	
Dobbins Road West of 51st Avenue (1991-1997) growth =		8.79%
Dobbins Road East of 51st Avenue (1996-1997) growth =		50.23%
	Average:	**29.5%**

The 1997 approach volume of 1,112 vpd was added to 60 vpd from casino traffic to arrive at a 1997 total approach traffic volume of 1,172 vpd. Using a 29.5% growth on background volumes for Dobbins Road, the approach volumes for Dobbins Road east of 51st Avenue are as follows:

Year	Approach Volume
1997	1,172
2000	2,156
2005	3,797

The Laveen Elementary School is located on Dobbins Road east of 51st Avenue. Signalization of the Dobbins Road/51st Avenue intersection would help increase safety for pedestrians crossing 51st Avenue. The volume of heavy vehicles on 51st Avenue would potentially influence the desire for a controlled pedestrian crossing on 51st Avenue. The re-analysis of traffic volumes on Dobbins Road, the truck volumes on 51st Avenue and the proximity of the Laveen Elementary School are three reasons that the Dobbins Road/51st Avenue intersection may warrant signalization by 2003. **Warrant 1 of the MCDOT Signal Warrant Policy is anticipated to be met on Dobbins Road by 2003**.

A potentially realigned Pecos Road/St. Johns Road intersection is not projected to warrant signalization based on traffic volumes; however, a review of accident information may justify realignment and signalization of the intersection of St. Johns Road and Pecos Road with 51st Avenue. Additional information has been requested on specific accident reports from the Bureau of Indian Affairs. This additional information is anticipated to supply detailed descriptions of the types of accidents that have occurred at these intersections.

This realignment could involve St. Johns Road angling south through school property to align directly with the western terminus of Pecos Road. Aerial photographs and site visits indicate that existing dirt roads connect St. Johns Road and Pecos Road currently. This realignment would reduce the number of roadway intersections on 51st Avenue, and could potentially reduce the number of vehicular

accidents within this portion of 51st Avenue. **If a combined St. Johns Road/Pecos Road intersection with 51st Avenue is constructed, a signal warrant study should be conducted after the construction is complete.**

A signed crosswalk exists on 51st Avenue north of Pecos Road. There is no existing traffic control measure to protect pedestrians during crossing maneuvers. Installation of a traffic signal would include provisions for pedestrians crossing 51st Avenue and/or Pecos Road. These provisions may include pedestrian push buttons, crosswalks and flashing "Walk" and "Don't Walk" signs. A signalized pedestrian crossing decreases the potential for high speed vehicle/pedestrian conflicts.

The level of service analysis for year 2005 traffic volumes revealed that both the Dobbins Road and Baseline Road intersections with 51st Avenue are anticipated to operate below acceptable levels. The signal warrant analysis revealed that the Baseline Road/51st Avenue intersection is anticipated to warrant signalization by 2002 and the Dobbins Road/51st Avenue intersection by 2003. A level of service analysis of year 2005 traffic volumes at these two intersections was conducted based on the 1994 update of the Highway Capacity Manual and the assumption that signalization is warranted. The results are as follows:

TABLE 4.3.2
Year 2005 Intersection Level of Service
Proposed Geometry & Proposed Traffic Control (Low Cost)

Intersection	Level of Service		Proposed Traffic Control
	AM	PM	
51st Ave./Dobbins Rd.	B	B	Traffic Signal
51st Ave./Baseline Rd.	B	B	Traffic Signal

Signalization of the Dobbins Road and Baseline Road intersections with 51st Avenue are anticipated to mitigate level of service deficiencies in year 2005.

4.4 Construction Traffic Management

The management of construction traffic for 51st Avenue may be difficult between Pecos Road and Elliot Road due to the lack of alternative north/south routes. The recommended improvement for this portion of 51st Avenue is widening for turn lanes at Dusty Lane and Estrella Drive. This can be accomplished with a one lane traffic operation controlled manually with STOP and SLOW signs.

The section of 51st Avenue, between Elliot Road and Broadway Road, has north/south detour routes available and could be subject to road closures with provisions made for local home owners. **Because of the nature of existing travel patterns of heavy vehicles from I-10 west to I-10 south and vice versa, construction signs indicating vehicle delays, detours, road closures and roadway construction are recommended to be placed at interstate off ramps at 51st Avenue and Riggs Road.** A recommended construction phasing plan for the Baseline Road to Broadway Road segment would be to construct either the northbound or southbound through lanes completely and then shift 51st Avenue traffic to the completed lanes for construction of the remaining roadway.

5.0 ACCIDENTS

5.1 Maricopa County Accident Data

There were a total of thirty-five (35) intersection related accidents recorded by the Maricopa County Sheriff's Office during the period from January 1994 to December 1996. Additional accidents were recorded by the City of Phoenix and the Gila River Indian Community (GRIC). A summary of the accident records provided by MCDOT is shown in Table 5.1.1.

The MCDOT accident records provided indicate that 35 vehicular accidents were reported at intersections with 51st Avenue between Pecos Road and Broadway Road. The majority of the accidents reported are not necessarily correctable by geometric improvements. The construction of a four lane section with a median is anticipated to reduce potential conflicts created by passing on a two lane roadway. The widening of 51st Avenue would also allow for left turn bays at major intersections.

TABLE 5.1.1
MCDOT Accident Summary

Intersection	1994	1995	1996	Total Accidents
A) Broadway Rd. and 51st Ave.	0	1	1	2
	1 - Ran Stop Sign 1 - Rear End			
B) Southern Ave. and 51st Ave.	7	4	5	16
	8 - Ran Red Light 4 - Improper Right Turn 1 - Rear End 1 - Single Vehicle Struck Utility Pole 2 - FY RW Left Turn			
C) Baseline Road and 51st Ave.	3	4	1	8
	2 - Ran Stop Sign 4 - Rear End 1 - FY RW from Stop 1 - Truck Jack-Knife			

Table 5.1.1 (cont.)

Intersection	1994	1995	1996	Total Accidents
D) Dobbins Road and 51st Ave.	1	0	0	1
	1 - Improper Left Turn			
E) Elliot Road and 51st Ave.	0	2	1	3
	2 - Rear End 1 - FY RW Left Turn			
F) Estrella Drive and 51st Ave.	1	1	3	5
	2 - Passing, Struck Left Turn 1 - FYRW Struck from Stop Sign 2 - Ran Stop Sign			

NOTE: Individual MCDOT intersection accident records are provided in the Appendix.

Contributing Factors:

Intersection:
- A (1) Had been drinking
- B (1) Had been drinking, (1) Driving while intoxicated, (1) Left scene of accident
- C (1) Had been drinking, (3) Left scene of accident
- E (1) Inattention
- F (1) Fatal, driving while intoxicated, (1) Had been drinking

5.2 City of Phoenix Accident Data

Arizona DOT records were searched to determine if the City of Phoenix Police Department had responded to any accidents between Pecos Road and Broadway Road from January 1994 to December 1996. Only one collision was reported. It was approximately 335m (1,100 ft.) north of Southern Avenue on June 29, 1996 at 1:18 p.m. The accident involved property damage only and was a same direction side-swipe of a rear vehicle attempting to pass a left turning vehicle.

5.3 GRIC Accident Data

Research was conducted with the Gila River Indian Community Police Department to determine available accident information. The dispatch records for 1995 and 1996 were researched to determine the number of times that police were dispatched to traffic accidents on 51st Avenue. A list of the dispatch records for 1995 and 1996 by the Gila River Indian Community Police Department involving 51st Avenue is provided in Table 5.3.1.

Table 5.3.1
Gila River Indian Community Accident Information

YEAR 1995			
INTERSECTION	**DATE**	**INCIDENT**	**CASE NUMBER**
51st Avenue and Curve	11/23/95	62	95042837
51st Avenue and Gila Crossing Day School	12/28/95	961	95043711
51st Avenue and Komatke	5/21/95	61	95009493
	12/26/95	961	95043678
51st Avenue	12/9/95	961/92	95043231
51st Avenue and Pecos Road	8/2/95	Traffic Accident	95040065
	8/12/95	Fatal Traffic Accident	95040293
	8/18/95	Traffic Accident	95040445
51st Avenue and St. Johns Road	4/4/95	61	95006248
	5/11/95	962	95009126
	6/23/95	62	95010751
	8/13/95	Traffic Accident	95040328
	8/18/95	Traffic Accident	95040446
	9/25/95	Traffic Accident	95041475
51st Avenue and Tashquinth	1/5/95	61 DUI/ No DL/ Reckless Drive	95000237
	5/13/95	962	95009188
	6/18/95	961/962	95010594
	7/21/95	961	95020787
	8/28/95	Traffic Accident	95040730

Legend: 961 or 61=Property Damage Only; 962 or 62=Personal Injury; 963 or 63=Fatality

Table 5.3.1 Cont.	*Year 1995*		
INTERSECTION	**DATE**	**INCIDENT**	**CASE NUMBER**
51st Avenue and Housing	3/4/95	961	95004914
	7/23/95	Ped./Veh. 62	95020867
	7/19/95	961	95020727
51st Avenue and Bunn Street	1/13/95	961	95000930
	11/18/95	961	95042728
51st Avenue and Ju-Dam Street	11/23/95	61 Hit & Run	95042838
51st Avenue and Baptist Church	1/17/95	962	95001260
51st Avenue and Community Boundary	2/3/95	961	95002755
	12/31/95	962	95043828
51st Avenue and Dusty Lane	4/20/95	61	95008313
	5/7/95	961	95008982
	12/15/95	961/Horse	95043376
51st Avenue and Dobbins Road	3/11/95	Hit & Run	95005999
	Year 1996		
51st Avenue and Curve	8/12/96	962/Rollover	96006538
51st Avenue and Gila Crossing Day School	8/26/96	961	96006909
51st Avenue and Komatke Street	11/11/96	Hit and Run w/cows	96009724
	7/28/96	961	96006068
Legend: 961 or 61=Property Damage Only; 962 or 62=Personal Injury; 963 or 63=Fatality			

Table 5.3.1 Cont.	*Year 1996*		
INTERSECTION	**DATE**	**INCIDENT**	**CASE NUMBER**
51st Avenue	1/21/96	61/62 w/ a cow	96000451
	11/30/96	961w/ a cow	96010483
	2/7/96	961	96000862
	6/9/96	961/vehicle fire	96004543
	10/9/96	962	96008444
	11/13/96	961	96009778
	12/23/96	961/62	96011313
51st Avenue and Pecos Road	2/8/96	925 w/961/917A	96000892
	4/15/96	917A/961/62	96002621
	10/5/96	Hit and Run	96008300
	6/9/96	61	96004561
51st Avenue and St. Johns Road	2/19/96	Minor 61	96001235
	4/28/96	N/A	96003256
	6/17/96	Pedestrian and Vehicle	96004815
	6/26/96	962	96005037
	7/19/96	961	96005760
	7/15/96	962	96005685
51st Avenue and Tashquinth	1/12/96	61	96000236
	5/18/96	961	96003932
	12/21/96	961	96011178
51st Avenue and Housing	5/4/96	962/Rollover	96003410
	11/27/96	961	96010344
Legend: 961 or 61=Property Damage Only; 962 or 62=Personal Injury; 963 or 63=Fatality			

Table 5.3.1 Cont.	*Year 1996*		
INTERSECTION	**DATE**	**INCIDENT**	**CASE NUMBER**
51st Avenue and Bunn Street	8/27/96	961	96006933
	11/17/96	961	96009942
51st Avenue and Estrella Drive	7/22/96	962	96005889
*51st Avenue and *Estrella Drive*	8/2/96	962-Assist MCSD	96006190
51st Avenue and Dusty Lane	6/7/96	962	96004483
	11/15/96	962	96009873
51st Avenue and Baseline Road	4/6/96	Hit and Run w/ Vehicle	96002578
Legend: 961 or 61=Property Damage Only; 962 or 62=Personal Injury; 963 or 63=Fatality			

* Assisted MCSD-Accident Reported and included in MCDOT accident data.

Note: Two weeks of Oct 1995 was not available for review. Reports from Aug 95 to Oct 95 used a different description of Traffic Accidents that did not distinguish between personal injury and property damage only accidents. These incidents were simply recorded as Traffic Accident. All other incident information is based on the following: 961 or 61 = Property Damage Only; 962 or 62 = Personal Injury; 963 or 63 = Fatality.

The intersection accident information for 1995 and 1996 is summarized in Table 5.3.2. Detailed traffic accident information may be obtained from the Gila River Indian Community Police Department. All requests must provide the Case Number and date of the accident in question.

5.4 Accident Rate

The number of accidents that were recorded at the study intersections was analyzed using information from the Institute of Transportation Engineers (ITE) *Traffic Engineering Handbook*, 4th Ed. The accident rate of an intersection can be calculated by the following equation:

$$\text{Intersection Accident Rate} = \frac{\text{Annual Number of Accidents} \times 10^6}{\text{Annual Traffic Entering the Intersection}}$$

Where Rate = Accidents per Million Vehicles Entering the Intersection Annually (MEV)

Using the equation above, the accident rate for each intersection was calculated for each year data was available. The results are summarized in Table 5.4.1.

Table 5.3.2
Gila River Indian Community
Vehicular Accident Summary

51st Avenue Accident Location	**Summary of Accidents**	
	1995	**1996**
51st Avenue / Curve	1	1
51st Avenue / Gila Crossing	1	1
51st Avenue / Komatke	2	2
51st Avenue*	1	7
51st Avenue / Pecos Road	3	4
51st Avenue / St. Johns Road	6	7
51st Avenue / Tashquinth	5	3
51st Avenue / Housing	3	2
51st Avenue / Bunn Street	2	2
51st Avenue / Ju-Dam Street	1	0
51st Avenue / Baptist Church	1	0
51st Avenue / Reservation Boundary	2	0
51st Avenue / Dusty Lane	3	2
51st Avenue / Estrella Drive	0	2
51st Avenue / Dobbins Road	1	0
51st Avenue / Baseline Road	0	1
TOTAL	**32**	**34**

* - Accidents recorded, but cross street not listed.

Table 5.4.1
Accident Rate Determination

Intersection	1994			1995			1996		
	Accidents	Daily Volume	Annual Rate	Accidents	Daily Volume	Annual Rate	Accidents	Daily Volume	Annual Rate
51st Ave / Pecos Road	n/a	4939	n/a	3	5196	1.58	4	5482	2.00
51st Ave / St Johns Road	n/a	5682	n/a	6	5978	2.75	8	6307	3.48
51st Ave / Tashquinth	n/a	5360	n/a	5	5640	2.43	3	5950	1.38
51st Ave / Housing	n/a	5360	n/a	3	5640	1.46	2	5950	0.92
51st Ave / Bunn Street	n/a	5360	n/a	2	5640	0.97	2	5950	0.92
51st Ave / Dusty Lane	n/a	5288	n/a	3	5564	1.48	2	5870	0.93
51st Ave / Estrella Drive	1	5441	0.50	1	5725	0.48	4	6040	1.36
51st Ave / Elliot Road	0	5186	0.00	2	5456	1.00	1	5756	0.48
51st Ave / Dobbins Road	1	7060	0.39	1	7428	0.37	0	7837	0.00
51st Ave / Baseline Road	3	10673	0.77	4	11229	0.98	2	11847	0.23
51st Ave / Southern Ave.	7	11733	1.63	4	12345	0.89	5	13024	1.05
51st Ave / Broadway Road	0	10155	0.00	1	10684	0.26	1	11272	0.24

The average accident rate for signalized intersections in Maricopa County is 0.55 accidents per million entering vehicles. Southern Avenue has three consecutive years with an accident rate above the County Average. The average rate for unsignalized intersections in Maricopa County is 0.85 accidents per million entering vehicles. All study intersections between Pecos Road and Dusty Lane experienced accident rates above the County average in both 1995 and 1996. In addition, Estrella Drive (1996), Elliot Road (1995) and Baseline Road (1995) experienced accident rates above the County average.

The accident rates at the intersections of Pecos Road and St. Johns Road with 51st Avenue are substantially higher than the County average. The close proximity of these two intersections provides the potential for combining these two roadways so that they intersect 51st Avenue at a common location. The realignment of St. Johns Road to intersect Pecos Road east of 51st Avenue may help reduce the number of accidents that occur in this area. Furthermore, the combined volumes of Pecos Road and St. Johns Road may warrant signalization. The distance between the intersections of Pecos Road and St. Johns Road is 230m (750 ft.). These two intersections on 51st Avenue are too close together for both intersections to be signalized. Signalized intersections are generally not installed by Maricopa County when spacing between intersections is less than 0.8 km (0.5 mi.). A possible alignment alternative for St. Johns Road along an existing unpaved travel way is shown graphically in the Appendix for consideration by the Gila River Indian Community.

5.5 Accident Experience Signal Warrant

Accident experience at an intersection is a potential reason to signalize an intersection. The installation of a traffic signal can improve the overall safety and/or operation of an intersection. The Accident Experience Warrant (Warrant 6) is described in the *Manual on Uniform Traffic Control Devices* (MUTCD). A signal may be warranted based on Accident Experience when:

1. Less restrictive remedies have failed to reduce the accident frequency,
2. Five or more accidents that can be corrected through signalization occur within a 12 month period,
3. The volume of vehicular and pedestrian traffic is not less than 80% of the requirements called out in the Minimum Vehicular Volume warrant, the Interruption of Continuous Traffic warrant, or the Minimum Pedestrian Volume warrant, and
4. The signal installation will not seriously disrupt progressive traffic flow.

Accident information was not available for the section of 51st Avenue between Pecos Road and Dusty Lane for 1994; however, the data gathered for 1995 and 1996 revealed that the 51st Avenue/St. Johns Road and 51st Avenue/Tashquinth intersections had five or more accidents reported in a 12 month period. The section of 51st Avenue between Pecos Road and Dusty Lane had seven accidents reported in 1996 with no cross street given. **The type of accidents that occurred at these intersections is not known based on the data provided. It is recommended that additional information regarding these accidents be gathered to determine if the types of accidents are correctable through signalization and that a full safety investigation be conducted at these locations.**

The intersection of 51st Avenue and Southern Avenue has two years with five or more accidents in a 12 month period; however, this intersection is currently signalized.

5.6 Accident Mitigation Measures

The future traffic volumes on 51st Avenue, between Pecos Road and Dusty Lane, in conjunction with the high volume of accidents on 51st Avenue, in this same roadway section, indicate that the construction of a three lane roadway section may facilitate traffic flows and increase safety. The third traffic lane would provide left turn lanes at the intersections along 51st Avenue. The center turn lane would provide refuge for left turning vehicles without stopping through traffic while the turning vehicle waits for an acceptable gap to execute the left turn maneuver. A common accident type along two lane roadways occurs when queued vehicles try to pass and strike left turning vehicles. This accident type could be reduced through the addition of a third traffic lane that would not queue through traffic.

6.0 MULTI-MODAL

6.1 Pedestrian Accommodations

The existing school pedestrian crossing zone south of Dobbins Road on 51st Avenue has a school crossing guard to escort students across 51st Avenue at the beginning and end of the school day. A field observation was conducted during a typical school day to determine the intensity of the volume of pedestrians crossing 51st Avenue. A total of six (6) pedestrians were observed crossing 51st Avenue between 7:30 a.m. and 8:30 a.m. when school started and again in the afternoon when school ended on March 19, 1997.

The widening of 51st Avenue, south of Dobbins Road, is anticipated to increase the amount of time necessary for students to cross 51st Avenue. The widened cross section of 51st Avenue, the proximity of the elementary school to 51st Avenue, the high volume of heavy vehicles including occasional over height vehicles and pedestrian ramps with 12:1 slopes (to meet ADA requirements) indicate that there would be serious problems associated with constructing a pedestrian overpass over 51st Avenue for school children south of Dobbins Road.

It is recommended that pedestrian facilities be constructed concurrent with improvements to the 51st Avenue cross section. These pedestrian facilities are recommended to include curb, gutter, sidewalks and handicap ramps at the improved intersection of Dobbins Road and 51st Avenue. It is also recommended that the pedestrian sidewalk be extended south from this intersection along the west side of 51st Avenue to La Mirada Drive and east of the Dobbins Road/51st Avenue intersection along the south side of Dobbins Road to the bus drop-off point in front of the school. The routing of heavy vehicles to a truck route may reduce traffic volumes on 51st Avenue and further increase safety.

Existing pedestrian use would be accommodated at pedestrian crossings and on all ultimate bridge drainage structures. Pedestrian options south of Dobbins Road are listed in the public meeting comments contained in the Appendix.

6.2 Bicycle Provisions

The Maricopa County Association of Governments (MAG) has approved a bicycle plan for Maricopa County. The MAG Regional bicycle plan designates 51st Avenue as a Regional On-Road Bikeway. A 1.5m (4.9 ft.) bicycle lane on each side of the road would be required with the construction of the ultimate street cross section. Both three and four lane roadway cross sections for 51st Avenue would provide bicycle accommodations per County standards.

6.3 Bus Accommodations

City bus routes do not currently provide public bus service to the Laveen area. School buses provide public transportation for students to and from school. The construction of bus pullouts on 51st Avenue is not required at this time. Any future bus pullouts on 51st Avenue could be constructed within the proposed right-of-way; however, this would impact drainage conveyance in the shoulder areas and special drainage design would be required.

7.0 DRAINAGE INFORMATION

This portion of 51st Avenue from Pecos Road to Broadway Road, as well as the surrounding area, including the community of Laveen, has had isolated drainage problems, in part brought on by early road building and agricultural practices that resulted in the obliteration of natural drainage patterns that ran east to west. Though shallow flooding is probably experienced in many areas, there is little documentation regarding wide scale flooding. The south end of the project, near St. Johns Road, has experienced some degree of flooding historically, lying at the foot of South Mountain Park where runoff is quick and fans out over a wide front. Moving north along 51st Avenue the watershed enlarges, picking up the north slope of the Park and the flatter, agricultural areas that lie to the east. East-west streets such as Baseline Road can collect flows and convey them westward, but surface runoff is more prone to follow existing irrigation ditches in the area or flow across the fields.

This part of Maricopa County has been the target of interest over the last few years due to drainage problems, impending development and the proposed alignment of the South Mountain Freeway. HDR Engineering's conceptual freeway design (for ADOT) entailed a drainage study of the watershed that lies east of 51st Avenue. Their study, *Final Concept Drainage Report - South Mountain Freeway I-10 Papago to I-10 Maricopa*, Vols., I through III (1993) has identified many 50-year and 100-year point discharges in the vicinity of this project. The HDR study is a valuable resource as an overview of the watershed. In addition, the *Drainage Improvement Plan for the South Phoenix/Laveen Area* (1995), also by HDR, performed for the Flood Control District of Maricopa County (FCDMC), proposes specific flood mitigation measures to be taken in the area east of 51st Avenue. One of the Plan recommendations, a major storm drain trunk line (60 to 120-inch), is planned to be installed in the Baseline Road alignment, running from 7th Avenue west to 43rd Avenue, then north to the Salt River. At about the same time, a detention area at 43rd Avenue and Southern Avenue is planned. These flood prevention improvements are scheduled three or more years away. Other Plan improvements include numerous detention areas in the upper watershed east of 51st Avenue, some lying in the City of Phoenix. The schedule of these is uncertain.

The *Laveen Area Drainage Master Study* was performed for the FCDMC and covers this area. Also, the *Salt River Flood Insurance Study* should be evaluated for 100-year flow elevations at 51st Avenue.

Generally, the northern portion of 51st Avenue in this project, near Baseline Road, has been a traditional east-west drainage course where a waterway known as the Champion Drain (or Maricopa Drain) is the major collector. There are other cross drainage points, mainly irrigation tailwater ditches, as you move south along 51st Avenue. The drainage recommendation for this portion of 51st Avenue, from near Dusty Lane north to Broadway Road, is to provide a parallel drainage system, open ditch, along the east side until Baseline Road is reached and collected runoff (off-site and on-site) can either be discharged into the existing Champion Drain, or if subsequent analysis precludes that option, continued north via a new storm drain to the Salt River. Planned drainage improvements in the watershed should be accounted for to reduce the size of these drainage facilities. On the west side of 51st Avenue, interim 25-year retention areas can be constructed to collect half-street runoff from 51st Avenue. These retention area calculations are shown graphically in Figure 7.0.1.

From Dusty Lane south onto the Gila River Indian Community, 51st Avenue is served by existing cross culverts and probable overflow points in the road. It is recommended here that, as a minimum, the existing culverts be extended as necessary for the new street cross section. However, it is recommended that this section of roadway and its contributing watershed (South Mountain Park) be further studied in detail. This additional study is recommended to include research of the source material mentioned previously. It is also recommended that replacement cross drainage structures be designed per County criteria, subject to Gila River Indian Community approval.

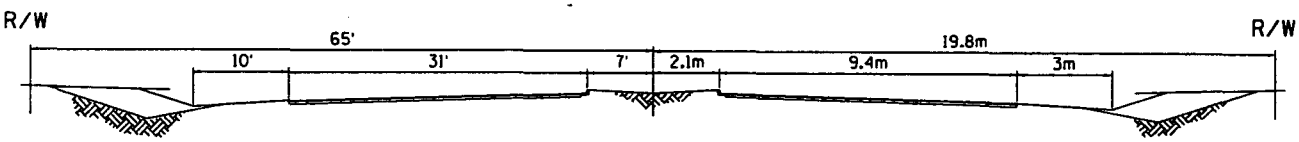
Drainage considerations for this project are enhanced because of the proximity of the study area to the South Mountain Park. A more detailed drainage study should be conducted in conjunction with the design stage of this project; however, for estimating construction costs, the existing amount of drainage for 51st Avenue from Pecos Road to Dusty Lane was assumed to be doubled as part of the analysis in this report.

8.0 LAND USE

Residential developments and agricultural activities are the predominant land use east and west of 51st Avenue. The majority of the land on each side of 51st Avenue throughout the study area is zoned Rural-43 (Rural, one dwelling unit per acre). Parcel 21B in Section 9 of T-1E R-2E, is zoned C-2 (Intermediate Commercial). This commercial parcel is located on the southeast corner of 51st Avenue and Dobbins Road. The southwest corner of 51st Avenue and Dobbins Road is zoned CS (Planned Shopping Center). The northeast corner of 51st Avenue and Dobbins Road is zoned C-1 (Neighborhood Commercial Zoning District). The City of Phoenix has developed a land use plan for the Laveen Community. A copy of this land use plan is contained in the report Appendix.

A few parcels are zoned for Industrial uses along 51st Avenue within the study area. These industrial parcels are listed in Table 8.0.1.

51st AVENUE SAFETY IMPROVEMENT STUDY
RETENTION CALCULATIONS



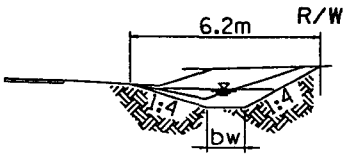
TYPICAL SECTION
RURAL PRINCIPAL ARTERIAL

RAINFALL
10-YEAR, 2-HOUR = 0.0483m(1.90")
25-YEAR, 2-HOUR = 0.0594m(2.34")

PRECIP. DEPTH CALCULATED WITH PREFRE FOR LAVEEN AREA

REQUIRED RETENTION VOLUME = DAC
WHERE D = PRECIPITATION DEPTH
A = AREA
C = RATIONAL RUNOFF COEFFICIENT (PVMT., 0.95 AND DITCH AREA, 0.30)

HALF STREET
10-YEAR VOLUME = (0.0483m)((9.4m X 5600m X 0.95)+(8.3m X 5600m X 0.30)) = 3090 CUBIC METERS
HALF STREET
25-YEAR VOLUME = (0.0594m)((9.4m X 5600m X 0.95)+(8.3m X 5600m X 0.30)) = 3800 CUBIC METERS



MAX. WATER DEPTH(to shoulder edge) = 0.65m(2.13')
bw = 1m
AREA = (0.65 X 2.6) + (0.65 X 1) = 2.34 SQ. METERS

RETENTION AREA

BASIN LENGTH REQUIRED = VOLUME REQ'D/AREA

BASIN LENGTH = "X" CUBIC METERS/2.34 = "X"m
(LONGITUDINAL SLOPE OF BASIN
BOTTOM IGNORED)

10-YEAR LENGTH REQ'D = 1321m	(380m per mile)
25-YEAR LENGTH REQ'D = 1624m	(467m per mile)

FIGURE 7.0.1

KIRKHAM MICHAEL

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TABLE 8.0.1
Existing Industrial Zoning

Township/Range	Zoning	Location
T1N, R2E, Section 33, Parcel 6	IND-3 (Heavy Industrial)	N. of Baseline Rd., E. of 51st Ave.
T1N, R2E, Section 29, Parcel 7, 2a, 2b	IND-3 (Heavy Industrial)	N. of Southern Ave., W. of 51st Ave.
T1N, R2E, Section 21, Parcel 1	A-1 (Light Industrial)	N. of Broadway Rd, E. of 51st Ave.

The property east and west of 51st Avenue is predominantly farmland in the section of 51st Avenue between Dusty Lane and Broadway Road. The property adjacent to 51st Avenue between Pecos Road and Dusty Lane is mostly undeveloped desert land.

9.0 RIGHT-OF-WAY

51st Avenue currently has varying amounts of right-of-way on each side of the section line between Pecos Road and Broadway Road as shown on the strip maps attached.

Additional right-of-way will be required along 51st Avenue at Estrella Road, Dusty Lane and from Elliot Road to Broadway Road concurrent with widening 51st Avenue. Acquisition of additional rights-of-way will be required to provide a 33.5m (110 ft.) right-of-way width from Elliot Road to Baseline Road and a 39.6m (130 ft.) right-of-way width per MCDOT's Rural Principal Arterial Road cross section from Baseline Road to Broadway Road. **However, during the roadway design, a value engineering process may be exercised to reduce new right-of-way acquisition in areas of lower travel speed.**

Table 9.0.1 summarizes the necessary right-of-way acquisition on a per parcel basis in order to provide a Rural Arterial Road cross-section from Baseline Road to Broadway Road typically constructed symmetrically on the section line. Table 9.0.2 summarizes the necessary right-of-way acquisition for a Rural Arterial Road cross-section between Baseline Road and Broadway Road constructed on an offset to the west. Table 9.0.3 provides the right-of-way acquisition information for a Rural Collector Road cross-section from Elliot Road to Baseline Road and minor acquisition at Estrella Drive.

The parcel acquisition quantities are based on widening symmetrically from the section line, except for specific locations. The Appendix of this report contains the right-of-way strip maps for the low cost construction option and shows both symmetrical and offset options between Baseline Road and Broadway Road.

TABLE 9.0.1
Rural Arterial Road - Right-of-Way Acquisition

-For construction typically centered on section line offset except the gas station area immediately north of Baseline Road.

Parcel	Hectares	Acres
Book 104, Map 88 Parcel 4D	0.3139	0.7757
Book 104, Map 88 Parcel 4D	1.1360	2.8071
Book 104, Map 89 Parcel 5	0.0728	0.1799
Book 104, Map 78 Parcel 15B	0.0491	0.1213
Book 104, Map 79 Parcel 3B	0.2490	0.6153
Book 104, Map 78 Parcel 14	0.2782	0.6874
Book 104, Map 79 Parcel 1B	0.2097	0.5182
Book 104, Map 78 Parcel 2	0.3752	0.9271
Book 104, Map 79 Parcel 2	0.2798	0.6914
Book 104, Map 75 Parcel 7A, Lot 54	0.3444	0.8510
Book 104, Map 74 Parcel 4, Lot 58	0.4151	1.0257
Book 104, Map 74 Parcel 1A, Lot 56	0.1795	0.4436
Book 104, Map 75 Parcel 9C	0.0547	0.1352
Book 104, Map 74 Parcel 1A, Lot 56	0.2249	0.5557
Well Site	0.0566	0.1400
Book 104, Map 75 Parcel 9D, Lot 46	0.0350	0.0865
Book 104, Map 74 Parcel 1A, Lot 55	0.0269	0.0665
Book 104, Map 75 Parcel 3, Lot 46	0.1509	0.3729
Book 104, Map 74 Parcel 2A	0.0772	0.1908
Book 104, Map 63 Parcel 4B	0.4281	1.059

Table 9.0.1 cont.

Rural Arterial Road - Right-of-Way Acquisition

-For construction typically centered on section line offset except the gas station area immediately north of Baseline Road.

Parcel	Hectares	Acres
Book 104, Map 64 Parcel 7	0.2265	0.5597
Book 104, Map 63 Parcel 4A	0.0538	0.1329
Book 104, Map 60 Parcel 2B	0.0730	0.1804
Book 104, Map 59	0.0278	0.0687
Book 104, Map 59 Parcel 2	0.0502	0.1241
Book 104, Map 59 Parcel 3	0.0613	0.1515
Book 104, Map 45 Parcel 4	0.0365	0.0902
Book 104, Map 44 Parcel 5	0.0912	0.2254
Totals	**5.5773**	**13.7832**

TABLE 9.0.2

Rural Arterial Road - Right-of-Way Acquisition

-For construction of Rural Arterial Road on an offset to the west.

Parcel	Hectares	Acres
Book 104, Map 88 Parcel 4D	1.5339	3.7904
Book 104, Map 79 Parcel 3B	0.3810	0.9415
Book 104, Map 79 Parcel 1B	0.3921	0.9689
Book 104, Map 79 Parcel 2	0.6485	1.6025
Book 104, Map 74 Parcel 4, Lot 58	0.8068	1.9936
Book 104, Map 74 Parcel 1A, Lot 56	0.6909	1.7073
Well Site	0.0566	0.1400
Book 104, Map 74 Parcel 1A, Lot 55	0.0541	0.1337
Book 104, Map 75 Parcel 3, Lot 46	0.0661	0.1633

Table 9.0.2 cont.
Rural Arterial Road - Right-of-Way Acquisition
-For construction of Rural Arterial Road on an offset to the west.

Parcel	Hectares	Acres
Book 104, Map 74 Parcel 2A	0.0772	0.1908
Book 104, Map 63 Parcel 4B	0.4281	1.059
Book 104, Map 64 Parcel 7	0.2265	0.5597
Book 104, Map 63 Parcel 4A	0.0538	0.1329
Book 104, Map 60 Parcel 2B	0.0730	0.1804
Book 104, Map 59	0.0278	0.0687
Book 104, Map 59 Parcel 2	0.0502	0.1241
Book 104, Map 59 Parcel 3	0.0613	0.1515
Book 104, Map 60 Parcel 1	0.3061	0.7564
Book 104, Map 45 Parcel 4	0.0365	0.0902
Book 104, Map 44 Parcel 5	0.0912	0.2254
Totals	**6.0617**	**14.9803**

TABLE 9.0.3
Rural Collector Road - Right-of-Way Acquisition

Parcel	Hectares	Acres
Book 300, Map 3 Sheet 1, Parcel 11B	0.2830	0.6992
Book 300, Map 10 Sheet 2, Parcel 4B	0.0919	0.2271
Book 300, Map 2 Sheet 4, Parcel 46D	0.0370	0.0914
Book 300, Map 2 Sheet 4, Parcel 46C	0.1504	0.3716
Book 300, Map 10 Sheet 2, Parcel 4A	0.0868	0.2145
Book 300, Map 2 Sheet 4, Parcel 45	0.1768	0.4369
Book 300, Map 2 Sheet 4, Parcel	0.0688	0.1700

TABLE 9.0.3 cont.
Rural Collector Road - Right-of-Way Acquisition

Parcel	Hectares	Acres
Book 300, Map 10 Sheet 1, Parcel 57D	0.0175	0.0432
Book 300, Map10 Sheet 1, Parcel 56H	0.0218	0.0539
Book 300, Map 10 Sheet 1, Parcel 2L	0.0694	0.1715
Book 300, Map 10 Sheet 1, Parcel 2M	0.0075	0.0185
Book 300, Map 10 Sheet 1, Parcel 2N	0.0168	0.0415
Book 300, Map 10 Sheet 1, Parcel 2R	0.0280	0.0692
Book 300, Map 10 Sheet 1, Parcel 55	0.0281	0.0694
Book 300, Map 10 Sheet 1, Parcel 21A	0.0158	0.0390
Book 300, Map 10 Sheet 1, Parcel 21B	0.0251	0.0620
Book 300, Map 12 Sheet 1, Parcel 4A	0.0275	0.0680
Book 300, Map 12 Sheet 1, Parcel 10C	0.1141	0.2319
Book 300, Map 2 Sheet 1, Parcel 16	0.1745	0.4312
Book 300, Map 2 Sheet 1, Parcel 9G	0.0501	0.1238
Book 300, Map 12 Sheet 1, Parcel 12	0.1692	0.4181
Book 300, Map 2 Sheet 1, Parcel 9K	0.0467	0.1154
Book 300, Map 2 Sheet 1, Parcel 9L	0.0021	0.0052
Book 300, Map 2 Sheet 1, Parcel 9E	0.0460	0.1137
Book 300, Map 2 Sheet 1, Parcel 9D	0.0081	0.0200
Book 300, Map 2 Sheet 1, Parcel 9B	0.0294	0.0727
Book 300, Map 12 Parcel 13, Sheet 1	0.1267	0.3131
Book 300, Map 2 Sheet 1, Parcel 13B	0.1678	0.4147

TABLE 9.0.3 cont.
Rural Collector Road - Right-of-Way Acquisition

Parcel	Hectares	Acres
Book 300, Map 12 Sheet 1, Parcel 14B	0.1359	0.3358
Book 300, Map 2 Sheet 1, Parcel 13D	0.0447	0.1105
Book 300, Map 12 Sheet 1, Parcel 14C	0.2077	0.5132
Book 300, Map 2 Sheet 1, Parcel 13E	0.2557	0.6319
Totals	**2.7309**	**6.6981**

10.0 ENVIRONMENTAL INFORMATION

The only environmental concerns KM observed within the project study area are potential existing underground gasoline storage containers. Two gas stations are currently in operation with underground gasoline storage tanks in the study area vicinity. One station is on the east side of 51st Avenue approximately 370m (1,200 ft.) north of Baseline Road. The underground tanks are located approximately 20m (65 ft.) east of the 51st Avenue centerline. The second gas station/convenience market (Laveen Country Store) is located on the southeast corner of the Dobbins Road/51st Avenue intersection. The Laveen Country Store has underground gasoline storage tanks 35m (115 ft.) east of the 51st Avenue centerline. An abandoned underground gasoline storage container may exist on the north end of the Laveen Country Store, 12m (40 ft.) east of the 51st Avenue centerline. Existing concrete structures on the north side of the Country Store are believed to have provided the base for gasoline pumps that have been removed.

An Environmental Overview has been provided by MCDOT Environmental Division and is included in the Appendix of this report.

11.0 ROADWAY DESIGN ALTERNATIVES

11.1 Low Cost Alternative

This alternative consists of constructing a Rural Principal Arterial road with a raised median in accordance with MCDOT Roadway Design Manual, Figure 5.2 (Figure 11.1.1 of this report) from Baseline Road to Broadway Road, widening 51st Avenue from Elliot Road to Baseline Road to a major collector (Figure 11.1.2), and widening 51st Avenue at Dusty Lane and Estrella Drive to provide left turn lanes (Figure 11.1.3).

The widening of the Dusty Lane intersection will be accomplished by others during construction of the Gila River West End Casino.

The design speed of the improvements shall be approximately 90km/h (55 mph) south of Baseline Road (70km/h, 45mph in the Laveen area) and 90km/h (55 mph) north of Baseline Road. Improvements to Baseline Road west and east of 51st Avenue are included in a Capital Improvement Project; therefore, no improvements to Baseline will be evaluated as part of this study. A pavement section of 100mm (4 in.) AC over 250mm (10 in.) AB was used for determining the construction costs for pavement widening strips for roadway sections widened to three lanes and for the construction of left turn lanes. In addition, the costs include a penetration chip seal placed over the newly widened roadway. The MCDOT typical pavement section of 100mm (4 in.) AC over 250mm (10 in.) AB was used to develop the project costs for the Baseline Road to Broadway Road section.

The Dobbins Road intersection will be improved to provide left turn lanes on Dobbins Road. The widening on the east leg of the intersection will be continued to the west driveway of the Laveen Elementary School. Curb and gutter and a detached sidewalk will be constructed on the west side of 51st Avenue (Figure 11.1.4) from La Mirada Drive north to Dobbins Road and on the south side of Dobbins Road from 51st Avenue east to the west driveway of the Laveen Elementary School. In addition, curb returns and handicap ramps will be constructed at the Dobbins Road and La Mirada Drive intersections with 51st Avenue.

The construction of a left turn lane at Carver Road has not been included in the low cost alternative. This additional feature should be investigated during the design phase.

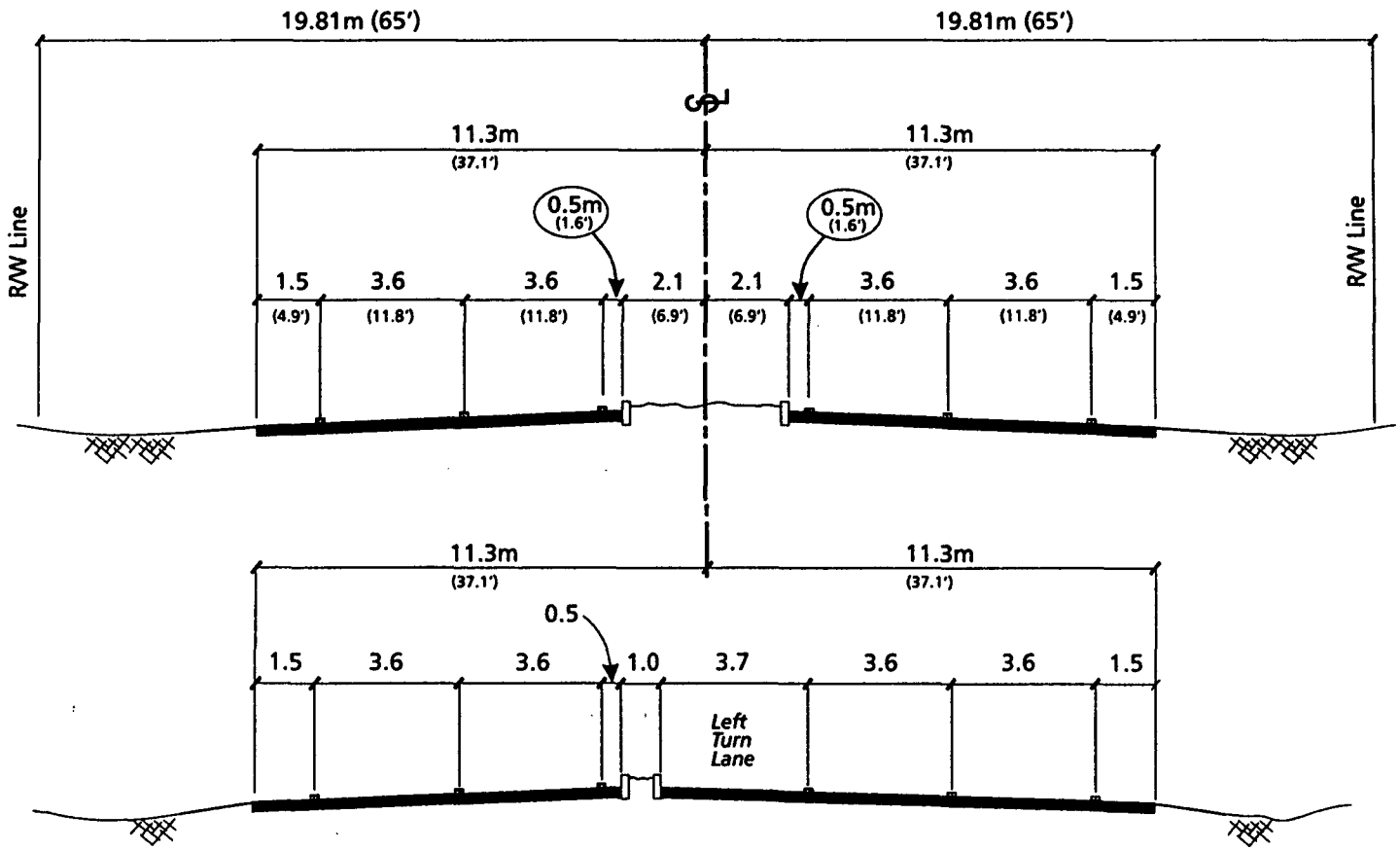
The proposed four lane section on 51st Avenue will transition to a three lane section at Baseline Road, and then back to a two lane section south of Elliot Road and north of Broadway Road. Pull boxes and conduit will be installed at the Elliot Road, Dobbins Road and Broadway Road intersections for future traffic signals.

A separate low cost project would widen 51st Avenue from Pecos Road to St. Johns Road to a three lane roadway section.

Conceptual improvement drawings overlayed on aerial photos for the low cost alternative are contained in the Appendix.

11.2 High Cost Alternative

This alternative is an upgrade to the Low Cost Alternative. A three lane roadway section would be constructed on 51st Avenue from Pecos Road to Elliot Road and a five lane section from Elliot Road north to Broadway Road. The intersection of Southern Avenue with 51st Avenue will be improved to provide a five lane roadway section (no median) on Southern Avenue, while Pecos Road, Dusty Lane, Estrella Drive and Elliot Road would be widened to provide three lane roadway sections immediately east and west of 51st Avenue.

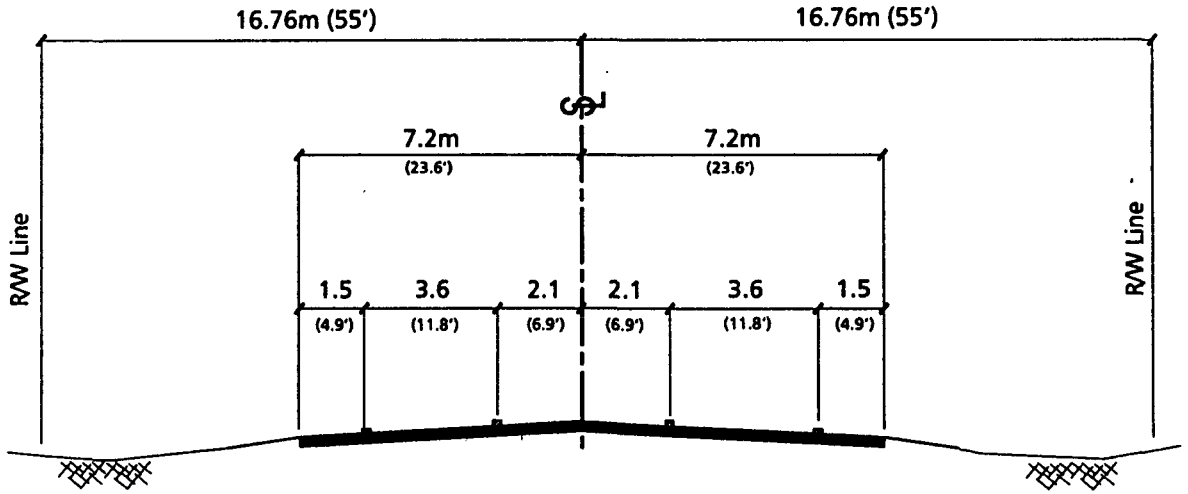


Rural Arterial Road Cross Section With Four Lanes and Raised Median
22.6m (74.2') Paved Width

51st Avenue
Baseline Road to Broadway Road

MRJP
5/07/97

Fig. 11.1.1

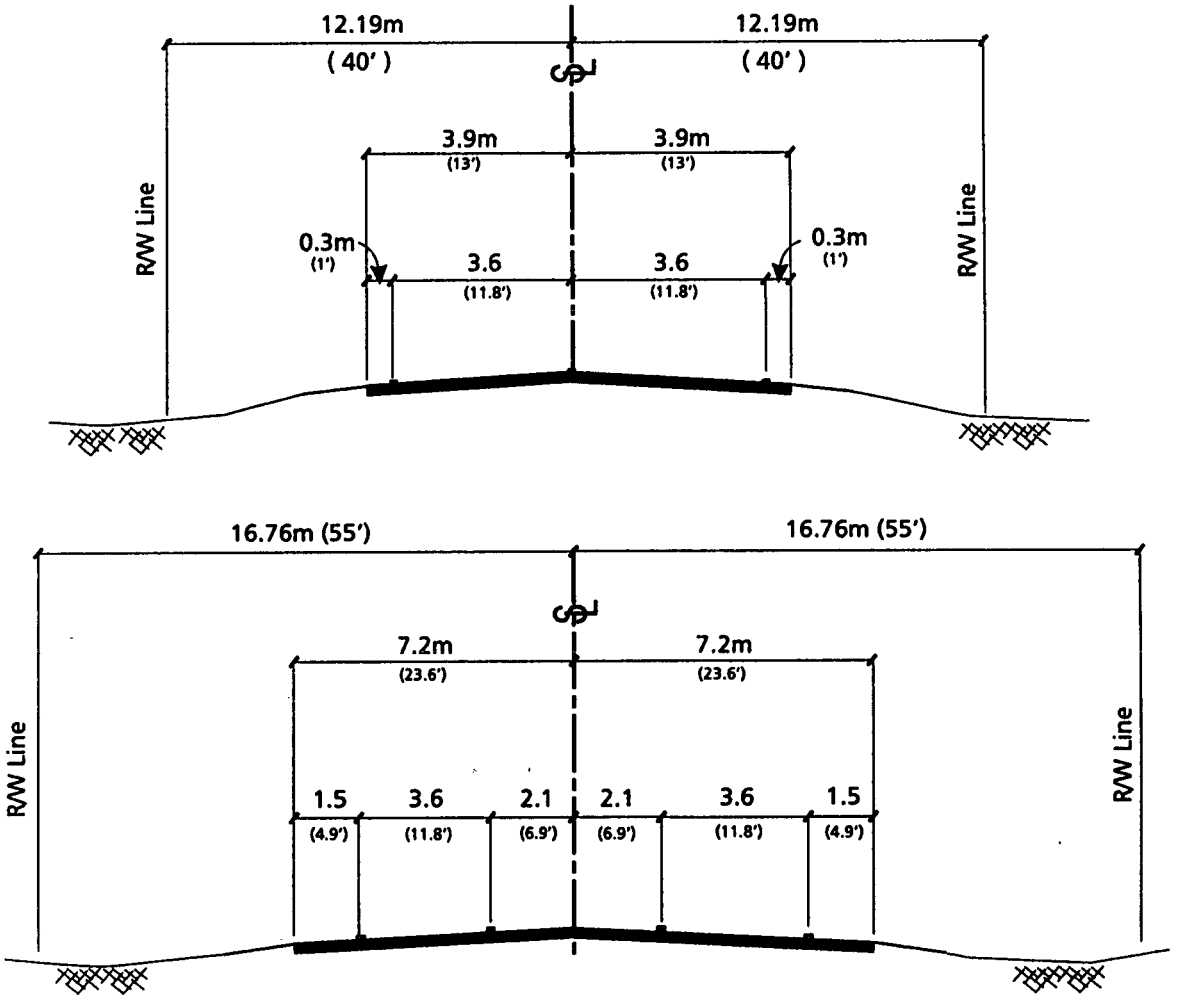


Rural Collector Road Cross Section With Three Lanes Including a Continuous Two Way Left Turn Lane

51st Avenue
Elliot Road to Baseline Road

MRJP
5/07/97

Fig. 11.1.2

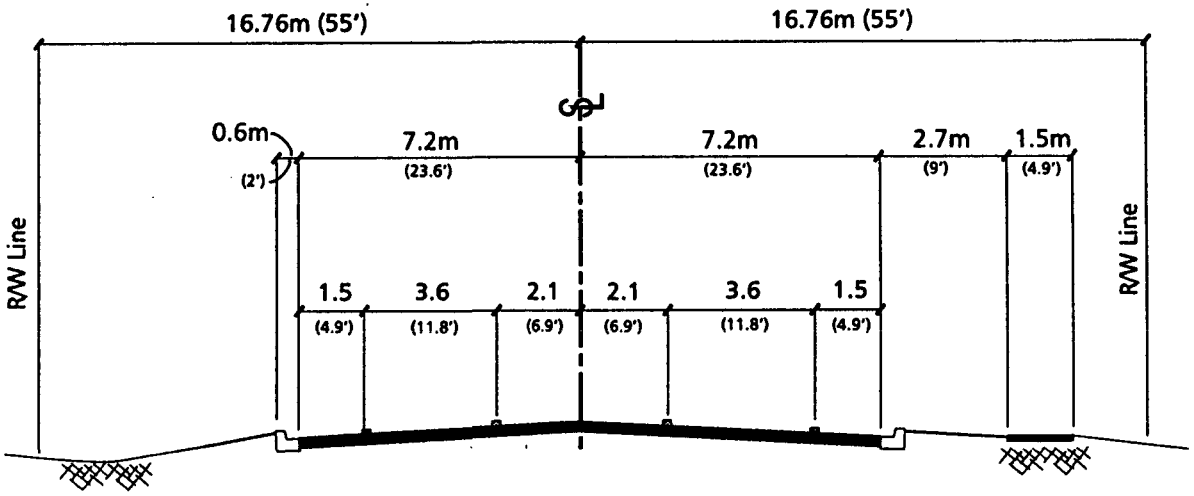


Two Lane Rural Collector Road Cross Section With Widening at Estrella and Dusty Lane

51st Avenue
Dusty Lane to Elliot Road

MRJP
5/07/97

Fig. 11.1.3



Urban Collector Road Cross Section With Three Lanes Including a Continuous Two Way Left Turn Lane

51st Avenue
Dobbins Road Intersection - Curb & Sidewalk Option

MRJP
5/05/97

Fig. 11.1.4

11.3 Preliminary Construction Costs

The cost summary for both alternatives is shown in Table 11.3.1. The detailed roadway cost estimates are shown in Tables 11.3.2 (A & B) and 11.3.3 (A & B) for the Low Cost and High Cost Alternatives, respectively. The intersection improvement costs are provided in Table 11.3.4. The utility relocation costs and the irrigation relocation costs are shown in Tables 11.3.5 and 11.3.6 (A & B), respectively. Preliminary costs for widening 51st Avenue between Pecos Road and St. Johns Road to a three lane section are shown in Tables 11.3.7 and 11.3.8.

There are presently no intergovernmental agreements for this project. Intergovernmental partners could include the City of Phoenix and the Gila River Indian Community.

11.4 Discussion of Alternatives

The proposed alternatives will increase the roadway capacity of 51st Avenue, between Elliot Road and Broadway Road. The proposed improvement will increase the roadway capacity through the addition of two travel lanes and/or a separate left turn lane. The separate left turn lane removes left turning vehicles from the through lane thus increasing the capacity of the road and removing that potential conflict. The five lane section will have a raised center median with left turn bays and median openings at one-fourth mile locations. The controlled location of left turning vehicles will potentially limit the number of conflict points on 51st Avenue and reduce the number of accidents.

The major differences between the two alternatives include the improvement to the Southern Avenue/51st Avenue intersection and the difference in roadway width of the cross section between Pecos Road and Baseline Road. Intersections are the capacity constrainers on most roadway corridors. Improving the intersections to better handle the traffic increases the capacity of a roadway. The low cost alternative does not improve the cross-streets, while the high cost alternative improves the Southern Avenue intersection to provide two through lanes and a left turn lane on all approaches (Figure 11.4.1), and the Pecos Road, St. Johns Road, Dusty Lane, Estrella Drive and Elliot Road intersections would be widened to provide left turn lanes at 51st Avenue (Figure 11.4.2). The low cost alternative concentrates primarily on intersection improvements south of Baseline Road. The high cost alternative would provide a continuous left-turn lane from Pecos Road to Elliot Road and a five lane section between Elliot Road and Baseline Road.

The widening of Baseline Road was not included in this cost estimate because it is part of a separate project at its intersection with 51st Avenue. Baseline Road is planned to be widened to five lanes concurrent with a City of Phoenix project.

The Laveen Country Store is located on the southeast corner of the Dobbins Road/51st Avenue intersection. The proximity of the store to 51st Avenue requires that the store be relocated concurrent with any widening of 51st Avenue. An abandoned farm house is located north of Dobbins Road on the west side and would be effected by right-of-way acquisition in this area.

Table 11.3.1

PRELIMINARY COST ESTIMATE SUMMARY

51st Avenue - Dusty Lane to Baseline (Low Cost)
Pecos Road to Baseline Road (High Cost)

COST CATEGORIES	Factors	No Build	Low Cost Alternative	High Cost Alternative
Construction		$0	$1,002,090	$3,761,670
Design	10%	$0	$100,209	$376,167
Construction Management	13%	$0	$130,272	$489,017
Right-of-Way		$0	$100,500	$100,500
Utility Relocation		$0	$190,740	$190,740
Wellsites & Irrigation Reconstruction		$0	$321,990	$382,990
Purchase/Relocate Laveen Store		$0	$110,000	$110,000
Removal of Abandoned Home North of Dobbins		$0	$0	$0
Administration	10%	$0	$100,209	$376,167
Total		$0	$2,056,010	$5,787,251

51st Avenue - Baseline Road to Broadway Road

PRELIMINARY COST ESTIMATE SUMMARY

COST CATEGORIES	Factors	No Build	Low Cost Alternative	High Cost Alternative
Construction		$0	$1,992,180	$2,171,940
Design	10%	$0	$199,218	$217,194
Construction Management	13%	$0	$258,983	$282,352
Right-of-Way		$0	$224,750	$224,750
Purchase/Relocate West Farm House @ Larson		$0	$80,000	$80,000
Utility Relocation		$0	$188,100	$188,100
Wellsite & Irrigation Reconstruction		$0	$1,118,040	$1,104,240
Administration	10%	$0	$199,218	$217,194
Total		$0	$4,260,489	$4,485,770

Table 11.3.2 (A)
51st Avenue - Dusty Lane to Baseline Road
Low Cost Alternative

Preliminary Construction Estimate

ALT: 1	Project Length (km) =	5.83
	Typical Number of Lanes =	3
	Typical Pavement Width (m) =	14.4
	Asphalt Concrete - 3 Lane Intersections (mm) =	100
	Aggregate Base Thickness - 3 Lane Intersections (mm) =	250

Item #	Description	Unit	Quantity	Unit Price	Total
107.01100	N.P.D.E.S.	L.S.	1	$9,000.00	$9,000
107.09200	Community Relations	Allowance	1	$35,000.00	$35,000
110.01000	Mobilization @ 5%	L.S.	1	$38,482.00	$38,490
205.03000	Roadway Excavation	m^3	3,625	$5.00	$18,130
215.00000	Channel & Retention Basin Excavation	m^3	2,190	$4.00	$8,760
	New Asphalt Pavement Widening Strips (100 mm AC, 250 mm	m^2	26,030	$15.25	$396,960
	Chip Seal on finished section	m^2	75,900	$158/ton oil**	$60,490
	New Traffic Signal @ Dobbins Road	L.S.	1	$90,000.00	$90,000
350.01110	Removal of Existing Improvements	L.S.	1	$6,000.00	$6,000
401.00000	Traffic Control @ 3.5%	L.S.	1	$26,937.00	$26,940
	Removal of Existing Pavement *	m^2	2,130	$2.50	$5,330
336.08100	Pavement Sawcut	m	6,960	$4.50	$31,320
402.00000	Traffic Signing & Striping - 3 lanes	m	3,480	$3.20	$11,140
	NB Right Turn Lane at Dobbins Road	L.S.	1	$2,550.00	$2,550
	Dobbins Road Intersection (Pedestrian Improvement)	L.S.	1	$66,540.00	$66,540
	Estrella Drive Intersection - (3 to 2 lane transition n/s)	L.S.	1	$28,420.00	$28,420
			Subtotal Construction		$835,070

* See table 11.3.4 for new A.C. / removal of A.C. for intersections.

** $158/ton oil @.45gal/CY, and $37/CY cover mat. @ 0.01CY/sq.yd

Contingency	20%	$167,020
Total		**$1,002,090**
Subtotal less percentages =		$769,640

Table 11.3.2 (B)
51st Avenue - Baseline Road to Broadway Road
Low Cost Alternative

Preliminary Construction Estimate

ALT: 1	Project Length (km) =	3.22
	Typical Number of Lanes =	5
	Typical Pavement Width (m) =	22.6
	Asphalt Concrete - All Others (mm) =	100
	Aggregate Base Thickness - All Others (mm) =	250

Item	Description	Unit	Quantity	Unit Price	Total
107.01100	N.P.D.E.S.	L.S.	1	$5,000.00	$5,000
107.09200	Community Relations	Allowance	1	$20,000.00	$20,000
110.01000	Mobilization @ 5%	L.S.	1	$76,500.00	$76,500
205.03000	Roadway Excavation	m^3	22,105	$5.00	$110,530
215.00000	Channel & Retention Basin Excavation	m^3	1,860	$4.00	$7,440
	New Asphalt Pavement (100 mm AC, 250 mm AB)	m^2	71,500	$15.25	$1,090,380
	Single Curb	m	5,464	$25.00	$136,600
336.08100	Pavement Sawcut	m	1,270	$4.50	$5,720
350.01110	Removal of Existing Improvements	L.S.	1	$7,000.00	$7,000
401.00000	Traffic Control @ 3.5%	L.S.	1	$53,553.00	$53,560
	Removal of Existing Pavement	m^2	21,585	$2.50	$53,970
	Relocate Traffic Signal @ Southern & 51st Ave	EA.	1	$75,000.00	$75,000
402.00000	Traffic Signing & Striping - 5 lanes	m	3,180	$5.80	$18,450

Subtotal Construction		$1,660,150
Contingency	20%	$332,030
Total		**$1,992,180**
Subtotal less percentages =		$1,530,090

Table 11.3.3 (A)
51st Avenue - Pecos Road to Baseline Road
High Cost Alternative

Preliminary Construction Estimate

ALT: 2	Project Length (km) =	9.65
	Typical Number of Lanes Pecos to Elliot =	3
	Typical Pavement Width - 3 Lane (m)=	14.4
	Typical Number of Lanes Elliot to Broadway =	5
	Typical Pavement Width - 5 Lane (m) =	19
	Asphalt Concrete - 3 Lane Intersections (mm) =	100
	Aggregate Thickness - 3 Lane Intersections (mm) =	250

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
107.01100	N.P.D.E.S.	L.S.	1	$15,000.00	$15,000
107.09200	Community Relations	Allowance	1	$60,000.00	$60,000
110.01000	Mobilization @ 5%	L.S.	1	$144,460.00	$144,460
205.03000	Roadway Excavation	m^3	32,285	$5.00	$161,430
215.00000	Channel & Retention Basin Excavation	m^3	13,130	$4.00	$52,520
	New Asphalt Pavement (100 mm AC, 250 mm AB)	m^2	118,860	$15.25	$1,812,620
336.08100	Sawcut Existing Pavement	m	16,070	$4.50	$72,320
	Chip Seal on Finished Section	m^2	116,840	$158/ton oil*	$93,120
340.01020	Single Curb	m	6,440	$25.00	$161,000
350.01110	Removal of Existing Improvements	L.S.	1	$9,750.00	$9,750
401.00000	Traffic Control @ 3.5%	L.S.	1	$101,120.00	$101,120
	Removal of Existing Pavement	m^2	54,330	$2.50	$135,830
	New Traffic Signal @ Dobbins Rd.	EA.	1	$90,000.00	$90,000
402.00000	Traffic Signing & Striping - 3 lanes	m	6,430	$3.20	$20,580
402.00000	Traffic Signing & Striping - 5 lanes	m	3,220	$5.80	$18,680
	NB Right Turn Lane at Dobbins Road	L.S.	1	$2,550.00	$2,550
	Pecos Road Intersection - (3 to 2 lane transition e/w)	L.S.	1	$28,420.00	$28,420
	St.Johns Road Intersection (3 to 2 lane transition e/w)	L.S.	1	$15,970.00	$15,970
	Dusty Lane Intersection (3 to 2 lane transition e/w)	L.S.	1	$15,970.00	$15,970
	Estrella Drive Intersection (3 to 2 lane transition e/w)	L.S.	1	$28,420.00	$28,420
	Elliot Road Intersection (3 to 2 lane transition e/w)	L.S.	1	$28,420.00	$28,420
	Dobbins Road Intersection (Pedestrian Improvement)	L.S.	1	$66,540.00	$66,540
			Subtotal Construction		$3,134,720

* $158/ton oil @.45gal/CY, and $37/CY cover mat.@ 0.01CY/sq.yd

Contingency	20%	$626,950
Total		**$3,761,670**
Subtotal less percentages =		$2,889,140

Table 11.3.3 (B)
51st Avenue - Baseline Road to Broadway Road
High Cost Alternative

Preliminary Construction Estimate

ALT: 2	Project Length (km) =	3.22
	Typical Number of Lanes Baseline to Broadway =	5
	Typical Pavement Width - 5 Lane (m) =	22.6
	Asphalt Concrete (mm) =	100
	Aggregate Thickness (mm) =	250

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
107.01100	N.P.D.E.S.	L.S.	1	$5,000.00	$5,000
107.09200	Community Relations	Allowance	1	$20,000.00	$20,000
110.01000	Mobilization @ 5%	L.S.	1	$83,410.00	$83,410
205.03000	Roadway Excavation	m^3	21,905	$5.00	$109,530
215.00000	Channel & Retention Basin Excavation	m^3	3,720	$4.00	$14,880
	New Asphalt Pavement (100 mm AC, 250 mm AB)	m^2	65,040	$15.25	$991,860
336.08100	Sawcut Existing Pavement	m	890	$4.50	$4,010
340.01020	Single Curb	m	5,465	$25.00	$136,630
350.01110	Removal of Existing Improvements	L.S.	1	$3,250.00	$3,250
401.00000	Traffic Control @ 3.5%	L.S.	1	$58,390.00	$58,390
	Removal of Existing Pavement	m^2	21,585	$2.50	$53,970
	Relocate Traffic Signal @ Southern and 51st Avenue	EA.	1	$75,000.00	$75,000
402.00000	Traffic Signing & Striping - 5 lanes	m	3,180	$5.80	$18,450
	Southern Avenue Inter. (5 to 2 lane transition e/w)	L.S.	1	$235,570.00	$235,570

Subtotal Construction		$1,809,950
Contingency	20%	$361,990
Total		**$2,171,940**
Subtotal less percentages =		$1,668,150

Table 11.3.4
51st Avenue - Pecos Road to Broadway Road
Intersections

Preliminary Construction Estimate

Item #	Description	Unit	Quantity	Unit Cost	Total
205.03000	Roadway Excavation	m^3	175	$4.00	$700
	New Asphalt Pavement	m^2	1,155	$9.00	$10,400
336.08100	Pavement Sawcut	m	260	$4.50	$1,170
	Pavement Removal	m^2	160	$1.20	$200
340.01120	Conc. C & G	m	0	$20.00	$0
	Conc S/W Ramp Std Det 231 Type "A"	EA	0	$600.00	$0
340.06950	Concrete Sidewalk Std Det 230	m^2	0	$16.00	$0
402.00000	Traffic Signal, "Box-in"	EA	1	$3,500.00	$3,500
	Subtotal Construction				$15,970

Item #	Description	Unit	Quantity	Unit Cost	Total
205.03000	Roadway Excavation	m^3	350	$4.00	$1,400
	New Asphalt Pavement	m^2	2,310	$9.00	$20,790
336.08100	Pavement Sawcut	m	520	$4.50	$2,340
	Pavement Removal	m^2	320	$1.20	$390
340.01120	Conc. C & G	m	0	$20.00	$0
	Conc S/W Ramp Std Det 231 Type "A"	EA	0	$600.00	$0
340.06950	Concrete Sidewalk Std Det 230	m^2	0	$16.00	$0
402.00000	Traffic Signal, "Box-in"	EA	1	$3,500.00	$3,500
	Subtotal Construction				$28,420

Item #	Description	Unit	Quantity	Unit Cost	Total
205.03000	Roadway Excavation	m^3	490	$4.00	$1,960
	New Asphalt Pavement	m^2	3,255	$9.00	$29,300
336.08100	Pavement Sawcut	m	1,280	$4.50	$5,760
	Pavement Removal	m^2	395	$1.20	$480
340.01120	Conc. C & G	m	520	$20.00	$10,400
	Conc S/W Ramp Std Det 231 Type "A"	EA	6	$600.00	$3,600
340.06950	Concrete Sidewalk Std Det 230	m^2	721	$16.00	$11,540
402.00000	Traffic Signal, "Box-in"	EA	1	$3,500.00	$3,500
	Subtotal Construction				$66,540

Table 11.3.4 (continued)
51st Avenue - Pecos Road to Broadway Road
Intersections

Preliminary Construction Estimate

[illegible]					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
205.03000	Roadway Excavation	m^3	350	$4.00	$1,400
	New Asphalt Pavement	m^2	2,310	$9.00	$20,790
336.08100	Pavement Sawcut	m	520	$4.50	$2,340
	Pavement Removal	m^2	320	$1.20	$390
340.01120	Conc. C & G	m	0	$20.00	$0
	Conc S/W Ramp Std Det 231 Type "A"	EA	0	$600.00	$0
340.06950	Concrete Sidewalk Std Det 230	m^2	0	$16.00	$0
402.00000	Traffic Signal, "Box-in"	EA	1	$3,500.00	$3,500
			Subtotal Construction		$28,420

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205.03000	Roadway Excavation	m^3	175	$4.00	$700
	New Asphalt Pavement	m^2	1,155	$9.00	$10,400
336.08100	Pavement Sawcut	m	260	$4.50	$1,170
	Pavement Removal	m^2	160	$1.20	$200
340.01120	Conc. C & G	m	0	$20.00	$0
	Conc S/W Ramp Std Det 231 Type "A"	EA	0	$600.00	$0
340.06950	Concrete Sidewalk Std Det 230	m^2	0	$16.00	$0
402.00000	Traffic Signal, "Box-in"	EA	1	$3,500.00	$3,500
			Subtotal Construction		$15,970

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205.03000	Roadway Excavation	m^3	2,380	$4.00	$9,520
	New Asphalt Pavement	m^2	9,260	$15.25	$141,220
336.08100	Pavement Sawcut	m	1,070	$4.50	$4,820
	Pavement Removal	m^2	330	$1.20	$400
340.01120	Conc. C & G	m	67	$20.00	$1,340
	Conc S/W Ramp Std Det 231 Type "A"	EA	4	$600.00	$2,400
340.06950	Concrete Sidewalk Std Det 230	m^2	54	$16.00	$870
402.00000	Traffic Signal	EA	1	$75,000.00	$75,000
			Subtotal Construction		$235,570

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205.03000	Roadway Excavation	m^3	40	$4.00	$160
	New Asphalt Pavement	m^2	265	$9.00	$2,390
			Subtotal Construction		$2,550

Table 11.3.5
Utility Relocation

51st Avenue - Dusty Lane to Baseline Road (Low Cost)
Pecos Road to Baseline Road (High Cost)
Preliminary Construction Estimate for Utility Relocation

Item #	Description	Unit	Quantity	Unit Cost	Total
1	O.H. Power 12 kv (poles)	EA.	9	$7,000.00	$63,000.00
2	O.H. Power 69 kv (poles)	EA.	9	$12,000.00	$108,000.00
3	Fire Hydrant	EA	3	$800.00	$2,400.00

Subtotal Construction		$173,400.00
Contingency	10%	$17,340.00
Total		$190,740.00

51st Avenue - Baseline Road to Broadway Road (Low and High Cost)

Preliminary Construction Estimate for Utility Relocation

Item #	Description	Unit	Quantity	Unit Cost	Total
1	O.H. Power 12 kv (poles)	EA.	9	$7,000.00	$63,000.00
2	O.H. Power 69 kv (poles)	EA.	9	$12,000.00	$108,000.00

Subtotal Construction		$171,000.00
Contingency	10%	$17,100.00
Total		$188,100.00

Table 11.3.6 (A)
Low Cost Irrigation Relocation

51st Avenue - Dusty Lane to Baseline Road (Low Cost)
Preliminary Construction Estimate

Item	Description	Unit	Quantity	Unit Price	Total
	Mobilization	L.S	1	$10,000.00	$10,000
	Clearing, Grubbing and Site Clean Up	EA.	1	$7,500.00	$7,500
	18" & 24" RGRCP	m	60	$213.20	$12,800
	30" & 36" RGRCP	m	10	$278.80	$2,790
	Remove Existing Structures	L.S.	1	$5,500.00	$5,500
	Concrete Lined Ditch	m	1,885	$114.80	$216,400
	Subtotal Construction				$254,990
	Structures	E.A.	2	$8,000.00	$16,000
	Irrigation System Design	L.S.	1	20%	$51,000
	Total Irrigation Relocation Estimate				$321,990

51st Avenue - Baseline Road to Broadway Road (Low Cost)
Preliminary Construction Estimate - Irrigation Relocation

Item	Description	Unit	Quantity	Unit Price	Total
	Mobilization	L.S	1	$10,000.00	$10,000
	Clearing, Grubbing and Site Clean Up	EA.	1	$7,500.00	$7,500
	18" & 24" RGRCP	m	120	$213.20	$25,590
	30" & 36" RGRCP	m	30	$278.80	$8,370
	Remove Existing Structures	L.S.	1	$5,500.00	$5,500
	Concrete Lined Ditch	m	1,885	$114.80	$216,400
	Subtotal Construction				$273,360
	Structures	E.A.	4	$10,000.00	$40,000
	Wellsites	E.A.	3	$250,000.00	$750,000
	Irrigation System Design	L.S.	1	20%	$54,680
	Total Irrigation Relocation Estimate				$1,118,040

Table 11.3.6 (B)
High Cost Irrigation Relocation

51st Avenue - Pecos Road to Baseline Road (High Cost)
Preliminary Construction Estimate

Item #	Description	Unit	Quantity	Unit Cost	Total
	Mobilization	L.S	1	$15,000.00	$15,000
	Clearing, Grubbing and Site Clean Up	EA.	1	$11,250.00	$11,250
	18" & 24" RGRCP	m	110	$213.20	$23,460
	30" & 36" RGRCP	m	65	$278.80	$18,130
	Remove Existing Structures	L.S.	1	$8,250.00	$8,250
	Concrete Lined Ditch	m	1,885	$114.80	$216,400
	Subtotal Construction				$292,490
	Structures	E.A.	4	$8,000.00	$32,000
	Irrigation System Design	L.S.	1	20%	$58,500
	Total Irrigation Relocation Estimate				$382,990

51st Avenue - Baseline Road to Broadway Road (High Cost)
Preliminary Construction Estimate - Irrigation Relocation

Item #	Description	Unit	Quantity	Unit Cost	Total
	Mobilization	L.S	1	$5,000.00	$5,000
	Clearing, Grubbing and Site Clean Up	EA.	1	$3,750.00	$3,750
	18" & 24" RGRCP	m	120	$213.20	$25,590
	30" & 36" RGRCP	m	30	$278.80	$8,370
	Remove Existing Structures	L.S.	1	$2,750.00	$2,750
	Concrete Lined Ditch	m	1,885	$114.80	$216,400
	Subtotal Construction				$261,860
	Structures	E.A.	4	$10,000.00	$40,000
	Wellsites	E.A.	3	$250,000.00	$750,000
	Irrigation System Design	L.S.	1	20%	$52,380
	Total Irrigation Relocation Estimate				$1,104,240

Table 11.3.7

PRELIMINARY COST ESTIMATE SUMMARY

51st Avenue - Pecos Road to St. Johns Road (Low Cost)
Pecos Road to St. Johns Road (High Cost)

COST CATEGORIES	*Factors*	*No Build*	*Low Cost Alternative*	*High Cost Alternative**
Construction		$0	$137,100	$0
Design	10%	$0	$13,750	$0
Construction Management	13%	$0	$17,850	$0
Right-of-Way		$0	$0	$0
Utility Relocation		$0	$0	$0
Wellsites & Irrigation Reconstruction		$0	$0	$0
Administration	10%	$0	$13,750	$0
Total		$0	$182,450	$0

* High Cost widening is included in high cost alternative previously listed in Table 11.3.1.

Table 11.3.8
51st Avenue - Pecos Road to St. Johns Road
Low Cost Alternative

Preliminary Construction Estimate

ALT: 1	Project Length (km) =	0.82
	Typical Number of Lanes =	3
	Typical Pavement Width (m) =	14.4
	Asphalt Concrete - 3 Lane Intersections (mm) =	100
	Aggregate Base Thickness - 3 Lane Intersections (mm) =	250

Item	Description	Unit	Quantity	Unit Cost	Total
107.01100	N.P.D.E.S.	L.S.	1	$1,500.00	$1,500
107.09200	Community Relations	Allowance	1	$5,000.00	$5,000
110.01000	Mobilization @ 5%	L.S.	1	$5,264.00	$5,270
205.03000	Roadway Excavation	m^3	0	$5.00	$0
	Borrow	m^3	1,640	$5.00	$8,200
	New Asphalt Pavement Widening Strips (100 mm AC, 250 m	m^2	4,550	$15.25	$69,390
	Chip Seal on finished section	m^2	10,620	$158/ton oil*	$8,470
401.00000	Traffic Control @ 3.5%	L.S.	1	$3,684.00	$3,690
336.08100	Pavement Sawcut	m	1,640	$4.50	$7,380
402.00000	Traffic Signing & Striping - 3 lanes	m	820	$3.20	$2,630
	Adjust Water Valve to Grade	E.A.	8	$200.00	$1,600
	Relocate Existing Street Signs	E.A.	11	$100.00	$1,100

	Subtotal Construction		$114,230
* $158/ton oil @.45gal/CY, and $37/CY cover mat. @ 0.01CY/sq.yd	Contingency	20%	$22,850
	Total		**$137,100**
	Subtotal less percentages =		$105,270

51st AVENUE SAFETY IMPROVEMENT STUDY

HIGH COST TYPICAL MAJOR INTERSECTION FOR 51 AVE BETWEEN BASELINE RD AND BROADWAY RD

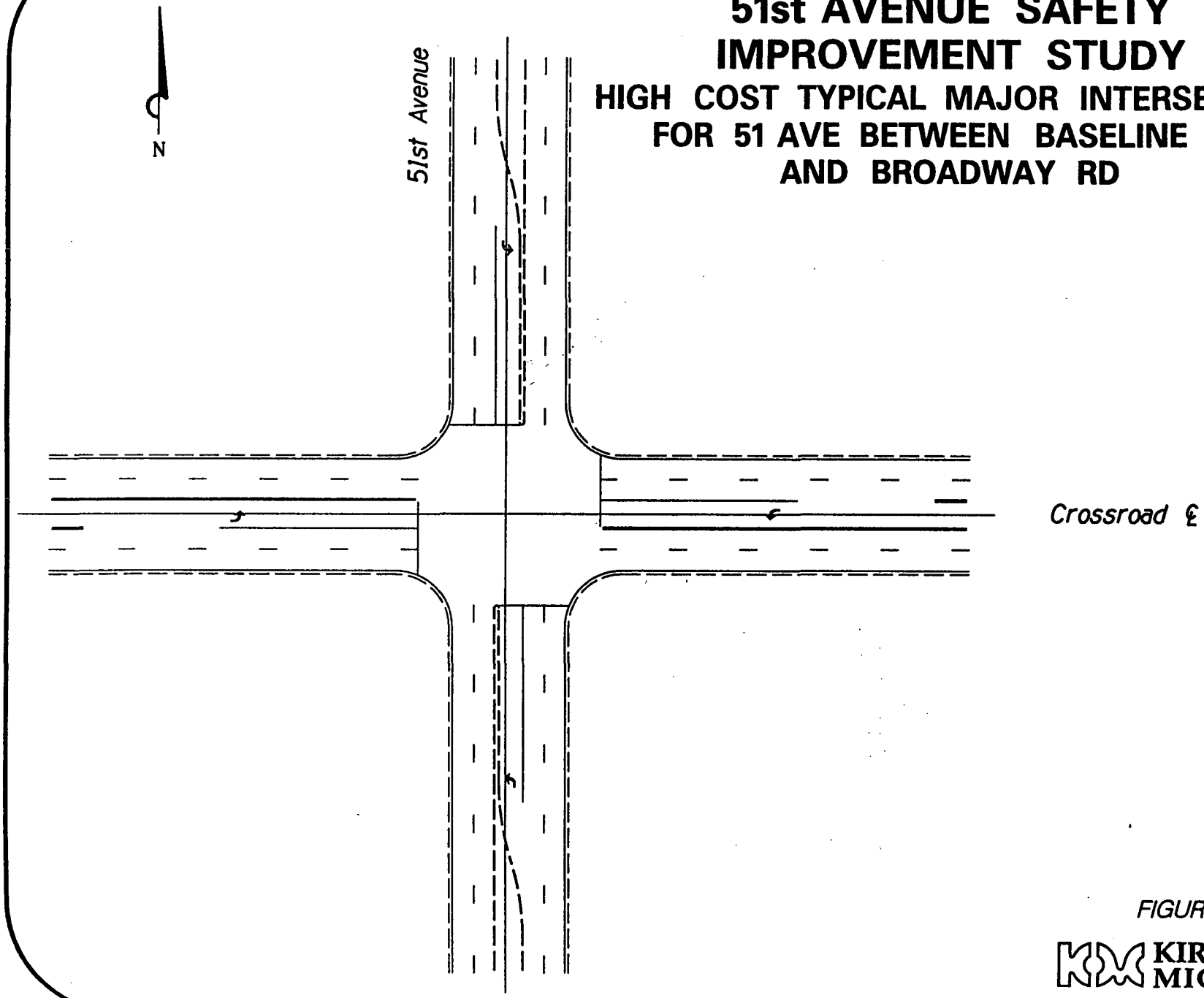


FIGURE 11.4.1

KIRKHAM MICHAEL

51st AVENUE SAFETY IMPROVEMENT STUDY

HIGH COST TYPICAL MAJOR INTERSECTION FOR 51ST AVENUE BETWEEN PECOS ROAD AND BASELINE ROAD

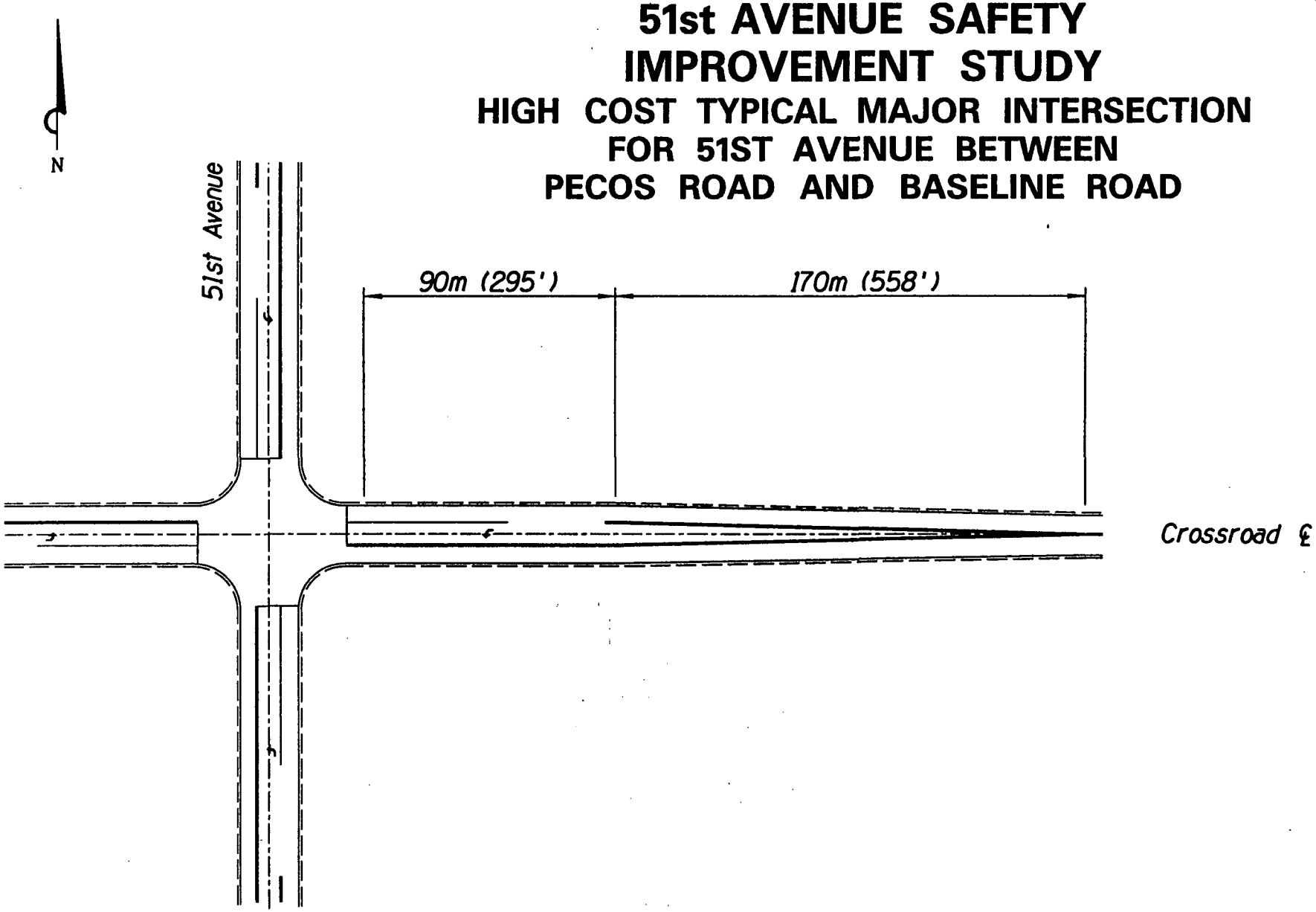


FIGURE 11.4.2

KIRKHAM MICHAEL

A gas station is located 365m (1200 ft.) north of Baseline Road within the area that would be needed for 51st Avenue right-of-way. It is recommended that 51st Avenue be offset to the west to avoid the gas station. Using the existing east right-of-way limit as the future right-of-way limit for a 19.8m (65 ft.) half section requires the 51st Avenue centerline to be shifted 10m (32.8 ft.) to the west. The alignment would shift back to a symmetrical alignment north of the existing gas station north of Baseline Road. This shift would occur through a taper.

As discussed in the Right-of-Way section (Section 9.0), a second alignment option would have 51st Avenue remain on an offset to the west. The relocation of 51st Avenue to the west would begin south of Baseline Road and would continue across Southern Avenue to south of the Salt River Bridge. The centerline would transition back to its original alignment south of the Salt River Bridge through a pair of horizontal curves. The relocation of 51st Avenue to the west will require the reconstruction of the west leg of the 51st Avenue/Southern Avenue intersection to replace the left turn lane. This second alignment is shown in the attached concept drawings.

At Larson Road, farm homes are located on both sides of 51st Avenue, and both sides of Larson Road could be effected by symmetrical right-of-way acquisition. Construction on an offset to the west would require removal of the west side home only. A sewer lift station is located south of the Gila River bridge on the west side of 51st Avenue. The lift station is protected by guardrail and is anticipated to be relocated as part of the bridge widening project planned by MCDOT under a separate design-build project. The criteria used to develop the two alternatives is shown in Tables 11.4.1 and 11.4.2.

11.5 Design Exceptions

The existing power poles on 51st Avenue between Pecos Road and Dusty Lane are within the 7.6m (25 ft.) clear zone. A design exception would be required if these were to remain and 51st Avenue widened to a three lane section. Most of the existing power poles do not have prior rights; however, if an existing power pole is to remain as an exception, guardrail can be installed to protect the base of the utility pole. Several well sites are located along 51st Avenue. The widening of 51st Avenue will place some of these well sites within the clear zone width. These well sites can be protected by guardrail as an alternative to the relocation of the existing well sites.

11.6 Preferred Alternative

The Low Cost Alternative would reconstruct 51st Avenue to a Rural Collector Road from Elliot Road to Baseline Road and as a Rural Principal Arterial Road from Baseline Road to Broadway Road. These roadway sections are comprised of a two lane roadway with a two-way left turn lane and a four lane section with a raised median. The proposed sections meet the requirements for the projected ADT in 2000. In addition, 51st Avenue would be widened at the intersections of Dusty Lane and Estrella Drive to provide exclusive left turn lanes.

TABLE 11.4.1
MAJOR DESIGN FEATURES
Pecos Road to Baseline Road

Standard Typical Section:	Rural Collector
Design Traffic Volume:	12,770 vpd (Year 2000)
Design Year:	2020
Design Vehicle:	WB-50
Design Speed:	90 km/h (55 mph), (70 km/h, 45 mph Laveen Area)
Pavement Design Life:	20 Years
Number of Lanes:	2 Lanes or 2 Lane with Left Turn Lanes
Roadway Width:	10.2m (33.5 ft.) to 14.4m (47.2 ft.)
Intersection Geometrics:	13.7m (45 ft.) Min. Return Radius
Drainage Structures:	N/A
Standard Right-of-way Requirements:	16.8 m (55 ft.) Typical Half-Width
Superelevation:	0.04 Maximum
Clear Zone Width:	7.6m (25 ft.), (4.6m, 15 ft. Laveen Area)
Stopping Sight Distance:	122m (400 ft.)
Other:	

TABLE 11.4.2
MAJOR DESIGN FEATURES
Baseline Road to Broadway Road

Standard Typical Section:	Rural Principal Arterial
Design Traffic Volume:	21,910 vpd (Year 2020)
Pavement Design Year:	2020
Design Vehicle:	WB-50
Design Speed:	90 km/h (55 mph)
Pavement Design Life:	20 Years Minimum
Number of Lanes:	4 Lanes with Raised Median
Roadway Width:	22.6m (74 ft.)
Intersection Geometrics:	10.7m (35 ft.) Min. Return Radius
Drainage Structures:	N/A
Standard Right-of-way Requirements:	19.8 m (65 ft.) Typical Half Width
Superelevation:	0.04 Maximum
Clear Zone Width:	7.6m (25 ft.)
Stopping Sight Distance:	160m (525 ft.)
Other:	

Dobbins Road would be improved to provide left turn lanes at 51st Avenue. The widening of the east leg of the intersection would be extended to the west driveway of the Laveen Elementary School. In addition, curb and gutter and a detached sidewalk will be constructed on the west side of 51st Avenue from La Mirada Drive to Dobbins Road and on the south side of Dobbins Road from 51st Avenue to the bus drop off for the Laveen Elementary School. The La Mirada Drive and Dobbins Road intersections with 51st Avenue would be improved to provide curb returns and handicap ramps on all corners.

A right-of-way half-width of 16.8m (55 ft.) is required for a Rural Collector Road. This will require the acquisition of additional right-of-way between Elliot Road and Baseline Road. An additional 9.8m (32 ft.) of right-of-way beyond the existing 10.1m (33 ft.) provides adequate space for the required roadway drainage ditches and is anticipated to meet the MCDOT requirements for a Rural Principal Arterial Section from Baseline Road to Broadway Road. However, a right-of-way width of 19.8m (65ft) is required for a Rural Arterial road where border curbs are not included.

12.0 UTILITY INFORMATION

The following utilities were noted during the field review and/or on Blue Stake records to be within or adjacent to the existing right-of-way of 51st Avenue between Pecos Road and Broadway Road:

- US West Communications
- Salt River Project (SRP); Irrigation and Overhead/Underground Electric Lines
- Southwest Gas
- Sante Fe; Petroleum Pipe Line
- Gila River Water and Sewer
- Gila River Communications; Fiber Optic Cable
- MCDOT Traffic; Traffic Signals
- El Paso Natural Gas
- City of Phoenix; Water and Sewer

The location and quantity of the existing utilities was researched through field visits and reviews of utility record drawings. The observed utility locations and quantities are listed in Table 12.0.1.

Table 12.0.1
Existing Utility Information

Utility	Location	Metric		English	
		Quantity	Units	Quantity	Units
Pecos Road to Dusty Lane (3.8km (2.4 Mi))					
3" PVC Water Line	30' E of 51st CL (n/s water line)	0.6	Km	0.4	Mi
4" ACP Water Line	30' E, 43' W of 51st CL (n/s water line)	1.3	Km	0.8	Mi
6" ACP Water Line	45' S of Pecos (e/w water line)	30	m	100	LF
8" ACP Water Line	43' W of 51st CL (n/s water line)	2.4	Km	1.5	Mi
8" PVC Water Line	21' E of 51st CL (n/s water line)	400	m	1300	LF
Fire Hydrant	56'E, 36'E,22'W of 51st CL	3	EA	3	EA
Potable Water Well	0.9 mi S. of Dusty, W of 51st	1	EA	1	EA
8" PVC Sewer Line	57' E of 51st CL	400	m	1300	LF
8" PVC Sewer Line	47' W of 51st CL	1.4	Km	0.9	Mi
6" PVC Sewer Line	47' W of 51st CL	300	m	1000	LF
Sewer Manholes	57' E of 51st CL	5	EA	5	EA
Sewer Manholes	47' W of 51st CL	15	EA	15	EA
12 kv OH Elec Line	60' W of 51st CL	3.2	Km	2	Mi
12 kv Elec Utility Pole	E of 51st, within 30' of EP	15	EA	15	EA
12 kv Elec Utility Pole	E of 51st, within 30'-50' of EP	7	EA	7	EA
12 kv Elec Utility Pole	W of 51st, within 30' of EP	1	EA	1	EA
OH Elec. Trans. Line Pole	58' W of 51st CL	1	EA	1	EA
1 1/4" SW Gas Line	15' S of Pecos Rd (e/w line)	30	m	100	LF
2" SW Gas Line	18' W of 51st (n/s line)	2.6	Km	1.6	Mi
20" High Pressure Gas Line	1 mi N of Pecos (e/w line)	30	m	100	LF
Gila River Comm. Line	50' E of 51st (n/s line)	3.8	Km	2.4	Mi
Culverts	E/W under 51st Ave	2	EA	2	EA
Culverts	Private Drives, Cross Streets (n/s line)	10	EA	10	EA
Petroleum Pipeline Conc. Pad	50' W, 65' E of 51st CL	2	EA	2	EA
Petroleum Pipeline	Waiting for utility maps for n/s line		N/A		N/A

Table 12.0.1 (cont.)
Existing Utility Information

Utility	Location	Metric		English	
		Quantity	Units	Quantity	Units
Dusty Lane to Elliot Road (2.6 km (1.6 Mi))					
6" ACP Water Line	14' E of 51st CL (n/s water line)	1.4	Km	0.9	Mi
12" ACP Water Line	20' E of 51st CL (n/s water line)	1.2	Km	0.75	Mi
12 kv OH Elec Line	36' E of 51st CL	2.6	Km	1.6	Mi
12 kv Elec Utility Pole	W of 51st, within 30' of EP	8	EA	8	EA
Electrical Underground Conduit	e/w Electric Lines	30	m	100	LF
1 1/4" SW Gas Line	35' E of 51st CL (n/s gas line)	70	m	240	LF
2" SW Gas Line	23' E of 51st CL (n/s gas line)	0.8	Km	0.5	Mi
US West Communication Lines	20-30' E of 51st (n/s line)	1	Km	0.6	Mi
US West Communication Lines	20-30' W of 51st (n/s line)	1.6	Km	1	Mi
Culverts	E/W under 51st Ave	5	EA	5	EA
Culverts	Private Drives, Cross Streets (n/s line)	6	EA	6	EA
Irrigation Pump Station	42' W of 51st CL	4	EA	4	EA
Open Dirt Irrigation Ditch	E. of 51st Ave	1	Km	0.6	Mi
Concrete Lined Irrigation Ditch	35' W of 51st CL	2.1	Km	1.3	Mi
Concrete Irrigation Structures	Within 30' of EP of 51st Ave	8	EA	8	EA
8" Petroleum Pipeline	West of 51st Ave	2.6	Km	1.6	Mi
6" Petroleum Pipeline	East of 51st Ave	2.6	Km	1.6	Mi
6' Block Wall (private)	37' E of 51st Ave CL	20	m	66	LF

Table 12.0.1 (cont.)
Existing Utility Information

Utility	Location	Metric		English	
		Quantity	Units	Quantity	Units
Elliot Road to Baseline Road (3.2 km (2.0 Mi))					
8" ACP Water Line	6' E of 51st CL (n/s water line)	70	m	230	LF
12" ACP Water Line	20'-52' E of 51st CL (n/s water line)	1.8	Km	1.1	Mi
12 kv OH Elec Line	36'-47' E of 51st CL	1.6	Km	1	Mi
12 kv Elec Utility Pole	W of 51st, within 30' of EP	9	EA	9	EA
69 kv OH Elec Line	37' E of 51st CL	1.6	Km	1	Mi
69 kv Elec Utility Pole	E of 51st, within 30' of EP	10	EA	10	EA
Electrical Underground Conduit	Various Locations/Traffic Signal	300	m	1000	LF
2" SW Gas Line	20' W of 51st CL (n/s gas line)	0.4	Km	0.25	Mi
2" SW Gas Line	20' E of 51st Ave CL	1.8	Km	1.1	Mi
US West Communication Lines	25' W of 51st (n/s line)	1.6	Km	1	Mi
US West Communication Lines	18-35' W of 51st (2 n/s lines)	1.6	Km	1	Mi
Culverts	E/W under 51st Ave	2	EA	2	EA
Culverts	Private Drives, Cross Streets (n/s line)	6	EA	6	EA
Open Dirt Irrigation Ditch	45' W. of 51st Ave CL	300	m	1000	LF
Concrete Lined Irrigation Ditch	45' W. of 51st Ave CL	370	m	1200	LF
Concrete Irrigation Structures	Within 30' of EP of 51st Ave	13	EA	13	EA
8" Petroleum Pipeline	West of 51st Ave	3.2	Km	2	Mi
6" Petroleum Pipeline	East of 51st Ave	3.2	Km	2	Mi
Laveen Country Store Building	33' E of 51st Ave CL	1	EA	1	EA
Abandoned Home	52' W of 51st Ave CL	1	EA	1	EA
Curb and Gutter	E of 51st at Post Office	30	m	100	LF

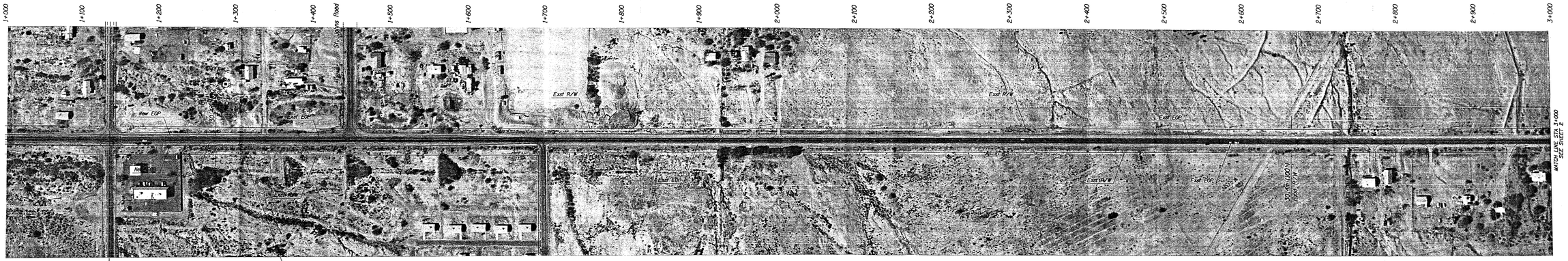
Table 12.0.1 (cont.)
Existing Utility Information

Utility	Location	Metric		English	
		Quantity	Units	Quantity	Units
Baseline Road to Broadway Road (3.2 km (2.0 Mi))					
8" ACP Water Line	at Southern and Roeser (e/w water line)	60	m	200	LF
12" Sewer Line	13' E of 51st CL	1.6	Km	1	Mi
12 kv OH Elec Line	25'-35' E of 51st CL	3.2	Km	2	Mi
12 kv Elec Utility Pole	W of 51st, within 30' of EP	3	EA	3	EA
2" SW Gas Line	15' E of 51st Ave CL	0.5	Km	0.33	Mi
US West Communication Lines	30' E, 30' W of 51st (2 n/s lines)	1.6	Km	1	Mi
Culverts	E/W under 51st Ave	2	EA	2	EA
Culverts	Private Drives, Cross Streets (n/s line)	5	EA	5	EA
6' x 6' Double Box Culvert	e/w culvert on north side of Baseline	1	EA	1	EA
Open Dirt Irrigation Ditch	W. of 51st Ave	1.6	Km	1	Mi
Concrete Lined Irrigation Ditch	35' W. of 51st Ave CL	1.3	Km	0.8	Mi
Concrete Irrigation Structures	Within 30' of EP of 51st Ave	9	EA	9	EA
Irrigation Pump Station	35' W of 51st CL	1	EA	1	EA
Irrigation Pump Station	25' W of 51st CL	1	EA	1	EA
Irrigation Pump Station	35' W of 51st CL to fence*	1	EA	1	EA
8" Petroleum Pipeline	West of 51st Ave	3.2	Km	2	Mi
6" Petroleum Pipeline	East of 51st Ave	3.2	Km	2	Mi
Salt River Bridge	S. of Broadway	1	EA	1	EA
Guardrail on Bridge	E & W sides of 51st, N & S of Bridge	210	m	700	LF
Traffic signal	Southern/51st; 4-Q-poles, 4-A-poles	1	EA	1	EA

Note: CL=Center Line; EP=Edge of Pavement; OH=Overhead
* 60' from pump to CL

Appendix

TAB



20 0 20 40
2000 Scale In Meters

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING DIVISION

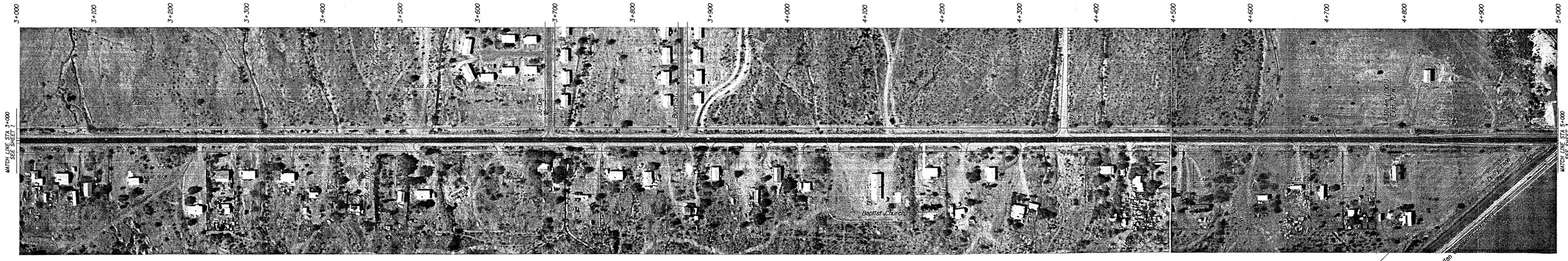
51st Avenue Safety Improvement Study
51st Avenue - Pecos to Broadway

	BY	DATE
DESIGNED	J. Kiser/N. Walp	9-97
DRAWN	N. Walp	9-97
CHECKED	J. Wilwett	9-97

KIRKHAM MICHAEL

LOW COST ALTERNATIVE

SHEET 1 OF 7



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2000 Scale in Meters

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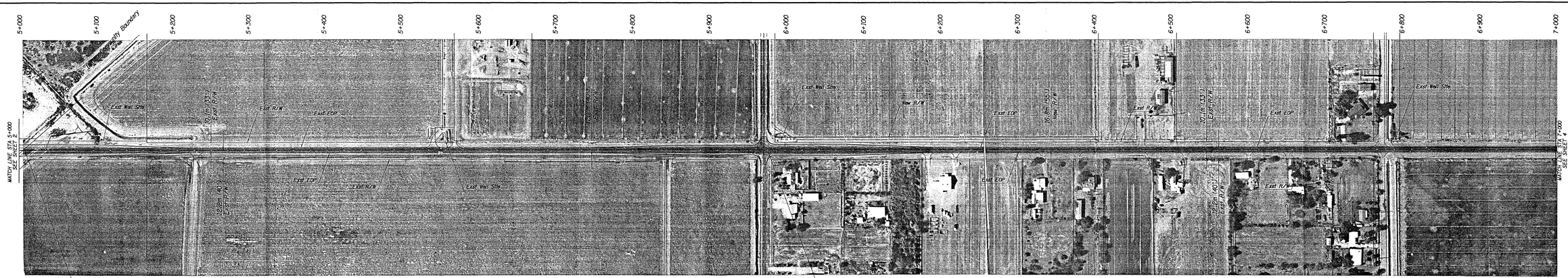
CHECKED	J. Willett	9-97

KIRKHAM MICHAEL

LOW COST ALTERNATIVE

SHEET 2 OF 7



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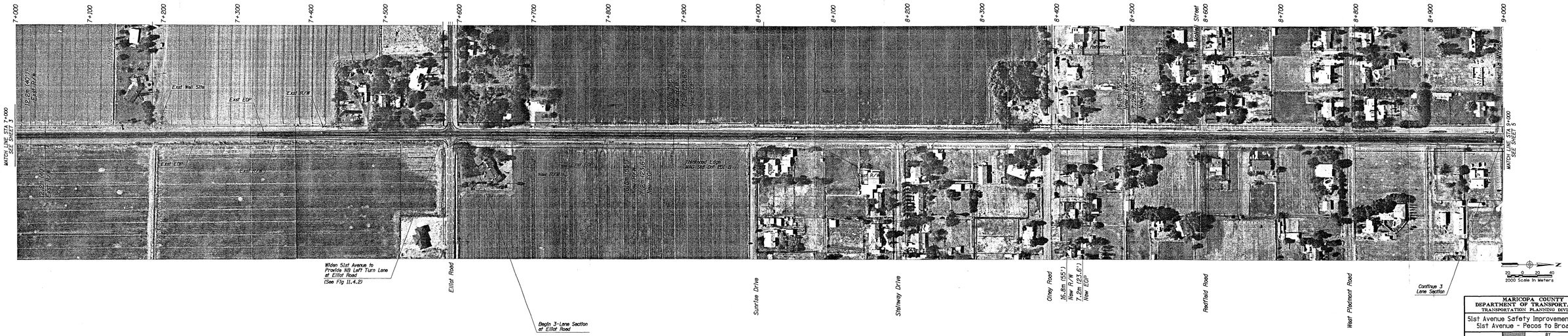
KIRKHAM MICHAEL

LOW COST ALTERNATIVE

SHEET 3 OF 7



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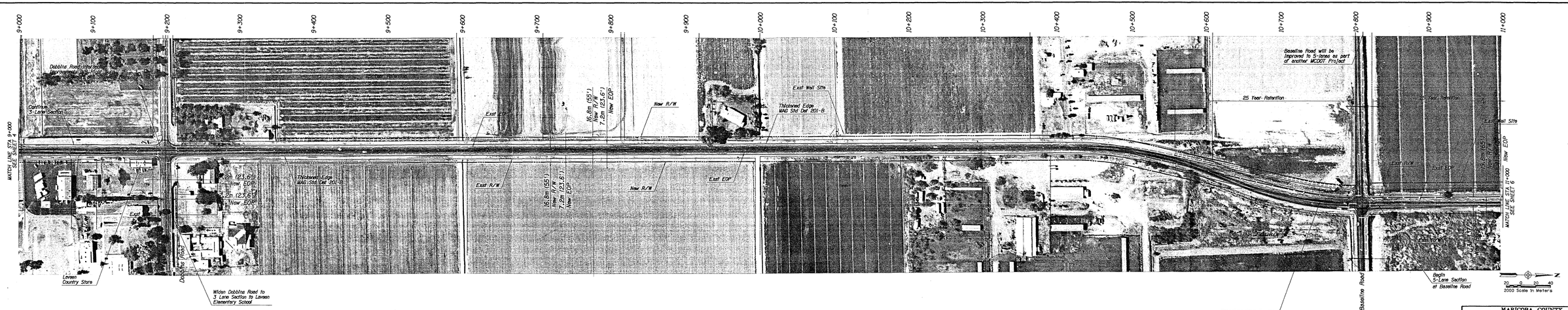
LOW COST ALTERNATIVE

SHEET 4 OF 7



NOTE:
The centerline of 51st Ave
is offset 12m to the west
Beginning at Baseline Road

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51st Avenue - Pecos to Broadway

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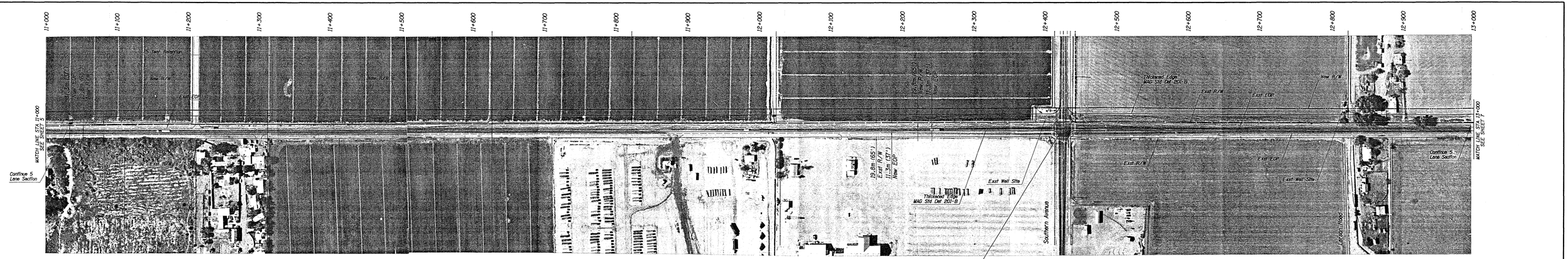
LOW COST ALTERNATIVE

SHEET 5 OF 7

Maine



NOTE:
The centerline of 51st Ave
is offset 10m to the west
Beginning at Baseline Road

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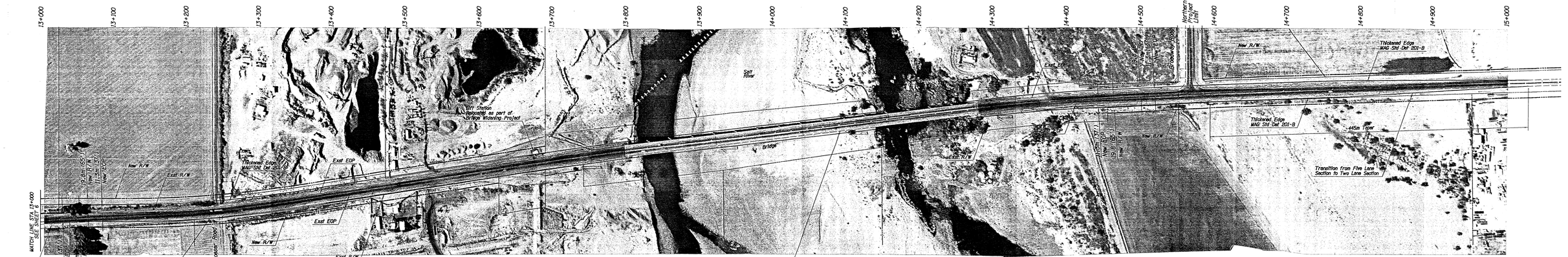
LOW COST ALTERNATIVE

SHEET 6 OF 7



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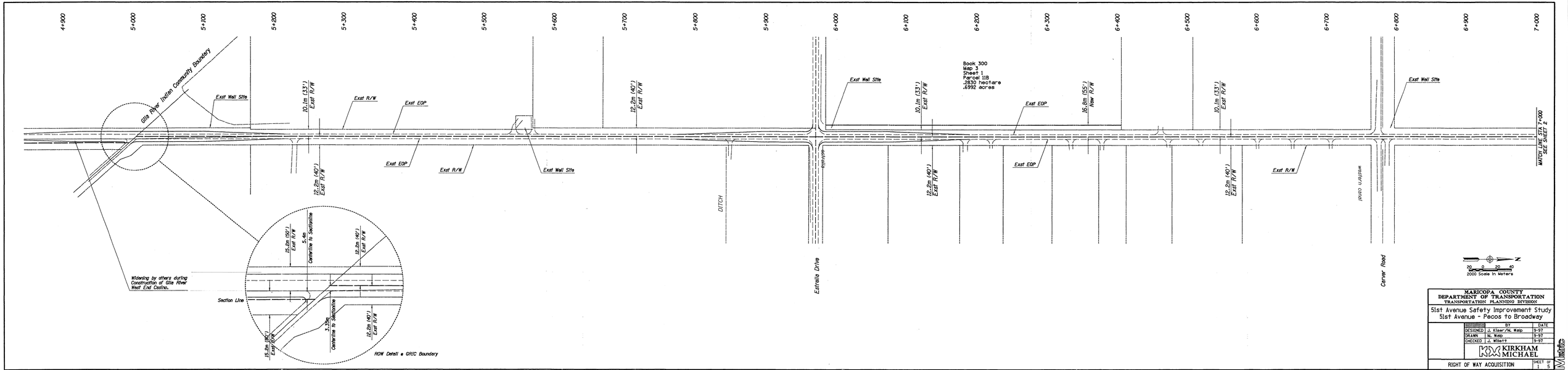
LOW COST ALTERNATIVE

SHEET 7 OF 7



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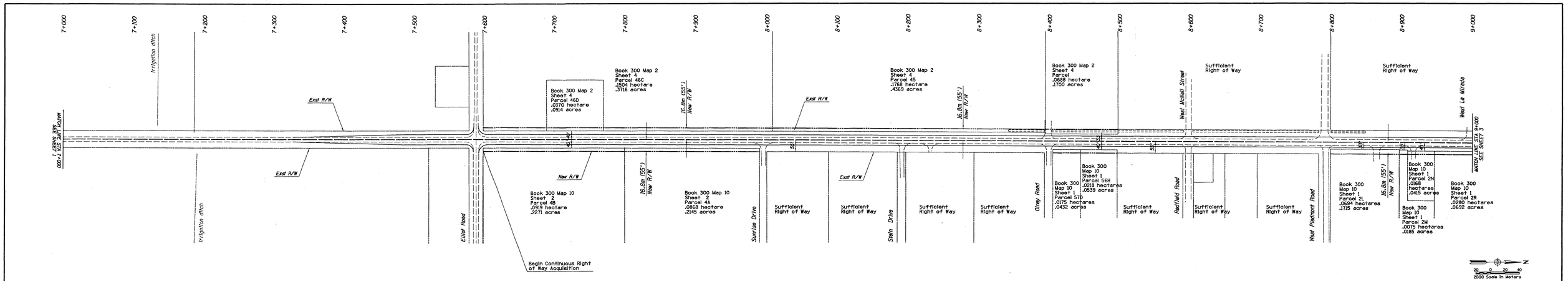
RIGHT OF WAY ACQUISITION

SHEET 1 OF 5



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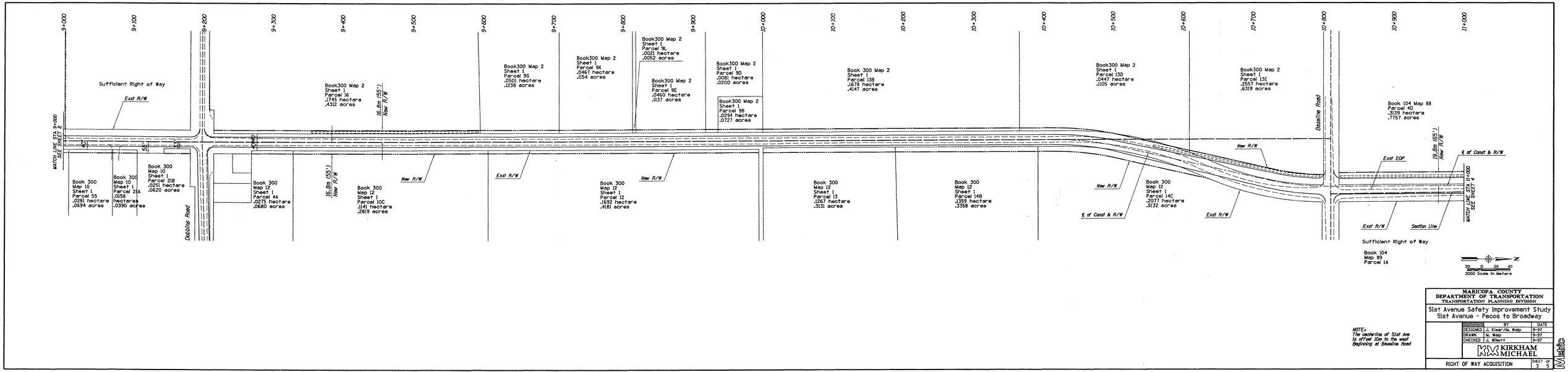
RIGHT OF WAY ACQUISITION

SHEET OF 2 5



NOTE:
The centerline of 51st Ave is offset 10m to the west Beginning at Baseline Road

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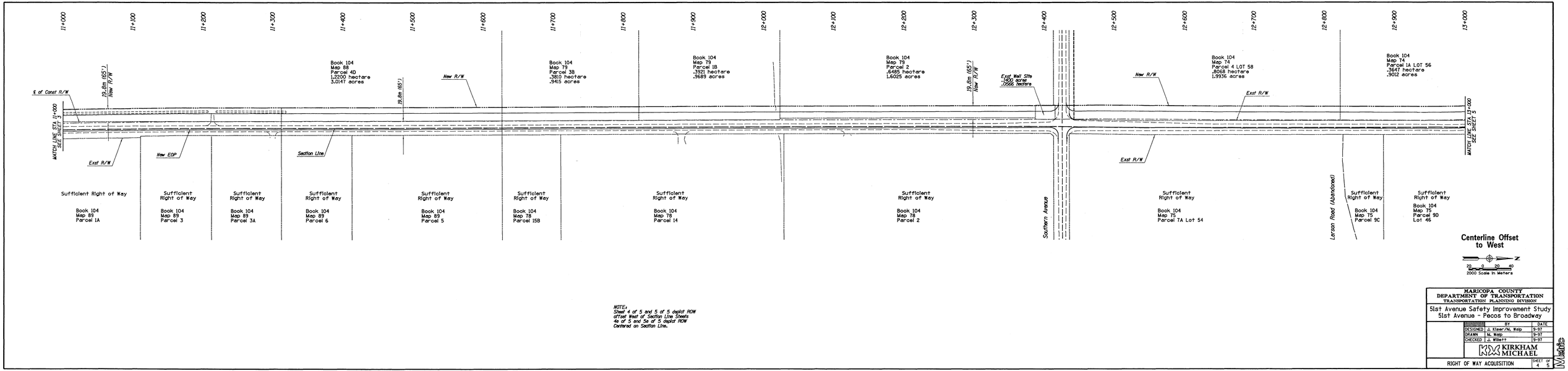
KIRKHAM MICHAEL

RIGHT OF WAY ACQUISITION

SHEET 3 OF 5

Mehic



NOTE:
Sheet 4 of 5 and 5 of 5 depict ROW offset West of Section Line Sheets 4a of 5 and 5a of 5 depict ROW Centered on Section Line.

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51st Avenue Safety Improvement Study
51st Avenue - Pecos to Broadway

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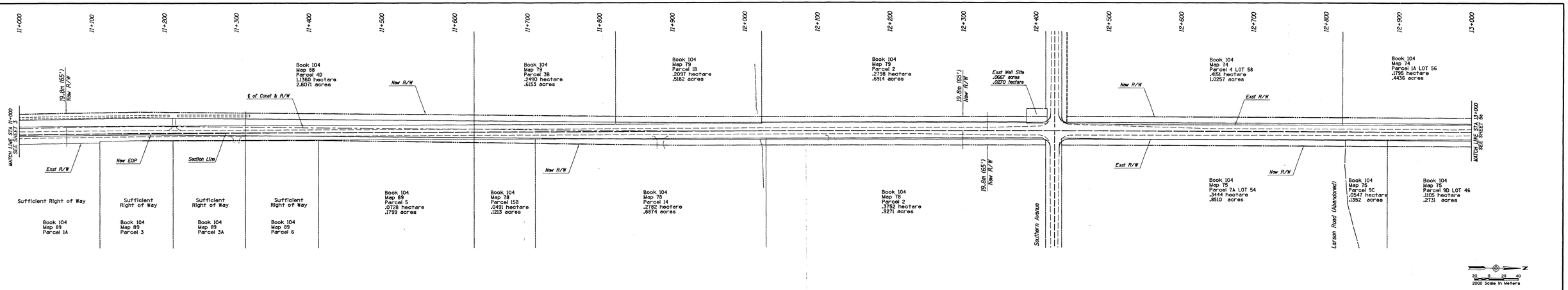
RIGHT OF WAY ACQUISITION

SHEET 4 OF 5

Metric



NOTE:
Sheet 4 of 5 and 5 of 5 depict ROW offset West of Section Line Sheets 4a of 5 and 5a of 5 depict ROW Centered on Section Line.

MARICOPA COUNTY
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51st Avenue Safety Improvement Study
51st Avenue - Pecos to Broadway

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KIRKHAM MICHAEL

RIGHT OF WAY ACQUISITION

SHEET 4a OF 5

Maple

13+000 13+100 13+200 13+300 13+400 13+500 13+600 13+700 13+800 13+900 14+000 14+100 14+200 14+300 14+400 14+500 14+600 14+700 14+800 14+900 15+000

Book 104
Map 74
Parcel 1A LOT 55
.0541 hectare
.1337 acres

Book 104
Map 74
Parcel 1A LOT 56
.3052 hectare
.8061 acres

Book 104
Map 74
Parcel 2A
.0772 hectare
.1908 acres

Book 104
Map 64
Parcel 7
.2265 hectare
.5597 acres

Salt River

Sufficient Right of Way

Book 104
Map 64
Parcel 4 Not Available
.0278 hectare
.0687 acres

Sufficient Right of Way

Book 104
Map 59
Parcel 1C

Sufficient Right of Way

Exst R/W

Book 104
Map 59
Parcel 1F
.0278 hectare
.0687 acres

19.8m (65')
New R/W

Broadway Road

Book 104
Map 59
Parcel 2
.0502 hectare
.1241 acres

New R/W

Book 104
Map 59
Parcel 3
.0613 hectare
.1515 acres

Book 104
Map 45
Parcel 4
.0365 hectare
.0902 acres

19.8m (65')
New R/W

Exst R/W

Bridge

Exst R/W

New R/W

445m Taper

Exst R/W

End of
Right of Way
Acquisition

Book 104
Map 60
Parcel 1
.3061 hectare
.7564 acres

Book 104
Map 44
Parcel 5
.0912 hectare
.2254 acres

Book 104
Map 60
Parcel 2B
.0730 hectare
.1804 acres

Book 104
Map 63
Parcel 4A
.0538 hectare
.1329 acres

Sufficient Right of Way

Book 104
Map 63
Parcel 2

19.8m (65')
New R/W

Exst R/W

Roeser

New R/W

Book 104
Map 75
Parcel 3 LOT 46
.0661 hectare
.1633 acres

Book 104
Map 63
Parcel 4B
.4281 hectare
1.059 acres

Sufficient Right of Way

NOTE:
Sheet 4 of 5 and 5 of 5 depict ROW
offset West of Section Line Sheets
4a of 5 and 5a of 5 depict ROW
Centered on Section Line.

MAIN LINE STA. 13+000
S.E. SEC. 13 T.1N. R.1E. 4

Centerline Offset to West

20 0 20 40
2000 Scale In Meters

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING DIVISION

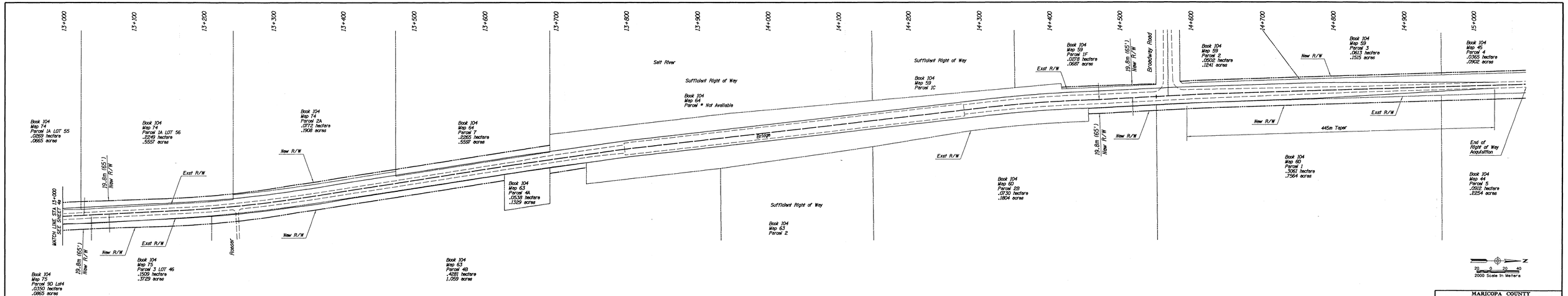
51st Avenue Safety Improvement Study
51st Avenue - Pecos to Broadway

	BY	DATE
DESIGNED	J. Kiser/M. Walp	9-97
DRAWN	M. Walp	9-97
CHECKED	J. Wikstt	9-97

KIRKHAM MICHAEL

RIGHT OF WAY ACQUISITION

SHEET 5 OF 5



NOTE:
Sheet 4 of 5 and 5 of 5 depict ROW offset West of Section Line Sheets 4a of 5 and 5a of 5 depict ROW Centered on Section Line.

MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING DIVISION

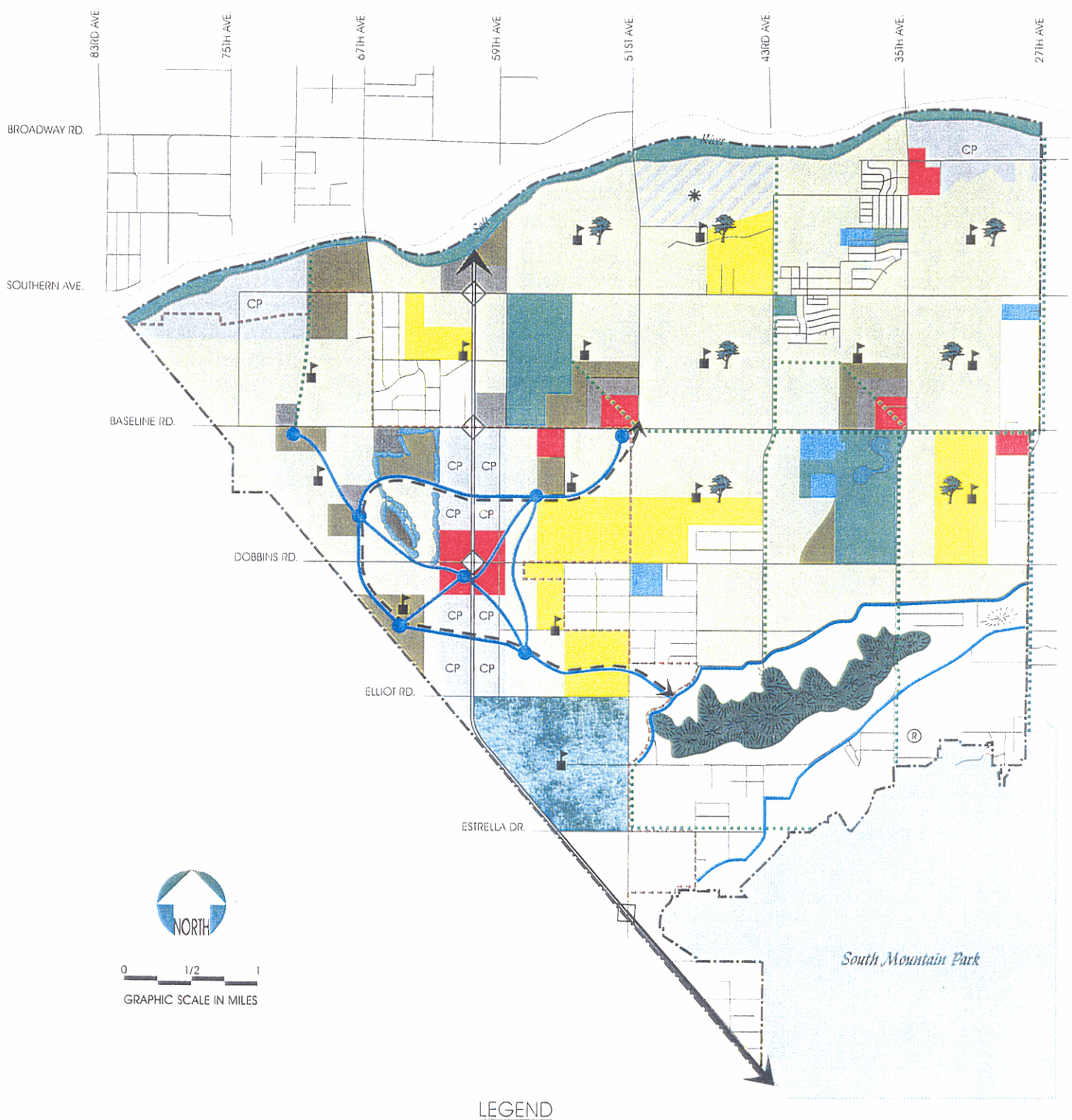
51st Avenue Safety Improvement Study
51st Avenue - Pecos to Broadway

	BY	DATE
DESIGNED	J. Kiser/M. Walp	9-97
DRAWN	M. Walp	9-97
CHECKED	J. Willett	9-97

KIRKHAM MICHAEL

RIGHT OF WAY ACQUISITION

SHEET 5a OF 5



LEGEND

- 0-1 DU/ACRE
- 0-2 DU/ACRE
- 2-5 DU/ACRE
- 5-10 DU/ACRE
- 10-15 DU/ACRE
- COMMERCIAL
- CP COMMERCE PARK
- PUBLIC/QUASI-PUBLIC
- HILLSIDE
- PARKS/OPEN SPACE
- CONSERVATION COMMUNITY
- SCHOOL
- Ⓡ RESORT
- WATERCOURSE/MULTI-USE TRAIL
- PARKWAY
- PLANNED COMMUNITY
- MULTI-USE TRAIL
- OPEN SPACE FEATURE
- ✳ Existing Sand & Gravel to transition to Residential

ALTERNATIVE G

SOUTHWEST GROWTH STUDY

LAVEEN

*** O U T P U T D A T A ***

REVISED JUNE 1988 TO UPDATE COMPUTATION OF SHORT-DURATION VALUES

PRECIPITATION FREQUENCY VALUES FOR CAR 51ST AVENUE, Maricopa County
PRIMARY ZONE NUMBER= 7
SHORT-DURATION ZONE NUMBER= 8

POINT VALUES

RETURN PERIOD

DURATION	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR	500-YR	
5-MIN	.33	.45	.53	.64	.73	.82	1.01	5-MIN
10-MIN	.50	.69	.81	.98	1.12	1.25	1.56	10-MIN
15-MIN	.61	.86	1.02	1.25	1.43	1.60	2.01	15-MIN
30-MIN	.81	1.15	1.38	1.69	1.93	2.17	2.73	30-MIN
1-HR	.98	1.42	1.71	2.11	2.41	2.72	3.42	1-HR
2-HR	1.09	1.58	1.90	2.34	2.68	3.02	3.80	2-HR
3-HR	1.16	1.68	2.02	2.49	2.86	3.22	4.05	3-HR
6-HR	1.30	1.88	2.26	2.79	3.20	3.60	4.53	6-HR
12-HR	1.45	2.09	2.52	3.10	3.55	4.00	5.04	12-HR
24-HR	1.60	2.30	2.77	3.41	3.91	4.40	5.54	24-HR

* IF YOUR SITE IS IN ARIZONA OR NEW MEXICO, PLEASE CONSULT THE FOLLOWING PAPER FOR REVISED DEPTH-AREA VALUES:
DEPTH-AREA RATIOS IN THE SEMI-ARID SOUTHWEST UNITED STATES
NOAA TECHNICAL MEMORANDUM NWS HYDRO-40
ZEHR AND MYERS
AUGUST 1984

INPUT DATA

PROJECT NAME=CAR 51ST AVENUE, Maricopa County
ZONE= 7 SHORT-DURATION ZONE= 8
LATITUDE= .00 LONGITUDE= 100.00 ELEVATION= 0
2-YR, 6-HR PCPN= 1.30 100-YR, 6-HR PCPN= 3.60
2-YR, 24-HR PCPN= 1.60 100-YR, 24-HR PCPN= 4.40

* * * * E N D O F R U N * * * *

John:

I checked ADOT's ALISS records for all collisions reported by the Phoenix Police Department for the segment along 51st Avenue, between Broadway and Pecos Roads during the most recent 3-year evaluation period available (August 1, 1993 to July 31, 1996). The majority of this segment is outside the Phoenix corporate limits.

During the three-year evaluation period, there was only one collision reported on 51st Avenue within this segment. It occurred approximately 1100 feet north of Southern Avenue on 6/29/96 at 1:18 pm and did not result in injuries or death. It involved two northbound pickup trucks on 51st Avenue. The front vehicle was making a left turn while the rear vehicle was attempting to pass, causing a "same direction sideswipe" collision. The driver of the passing vehicle was cited for "unsafe passing".

EXHIBIT A

ACCIDENT CARD SUMMARY LEGEND

DATE:	1/6/92 (MONTH/DAY/YEAR)
HOUR:	0000 - 2400 (MILITARY TIME)
SEVERITY:	/ - NO INJURY 2 - POSSIBLE INJURY 3 - NON-INCAPACITATING 4 - INCAPACITATING F - FATAL (ALSO NUMBER OF PERSONS FATALITY INJURED IN CIRCLE)
LIGHT:	(LIGHT CONDITIONS) DYL - DAYLIGHT DKN - DARKNESS DAWN DUSK
W/S:	(WEATHER CONDITIONS) / - CLEAR RAIN CLOUDY STRONG WIND DUST FOG
RD COND:	(ROAD CONDITIONS) / - NO UNUSUAL CONDITIONS WET LOOSE SAND DIRT GRAVEL FRESH OIL OTHER
TYPE:	DIAGRAM OF PATH OF VEHICLE AND OTHERS
REASONS AND CAUSES:	EXAMPLE: .5M S/O (5 TENTH OF A MILE SOUTH OF) FYRW - FAILED TO YIELD RIGHT OF WAY L/TURN - LEFT TURN R/TURN - RIGHT TURN SnR&P - SPEED NOT REASONABLE & PRUDENT P/DRIVE - PRIVATE DRIVE M/C - MOTORCYCLE F/C - FAILED TO CONTROL LSOA - LEFT SCENE OF ACCIDENT HBD - HAD BEEN DRINKING DWI - DRIVING WHILE INTOXICATED (OVER LEGAL LIMIT .10) P/VEH - PARKED VEHICLE PED - PEDESTRIAN C/L - CENTERLINE

CARD 1

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: SOUTHERN AVENUE (STOP) (YIELD) (SIGNAL) @ 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
5-6-94	1414	F (1)	DYL	/	/	1 2	#1 OR #2 RAN RED LIGHT STRUCK (S) 94-1023
5-12-94	1425	/	DYL	/	/	2 1	#1 SNR.P F/C STRUCK #2 MAKING RIGHT TURN (N) 94-1078
5-22-94	0030	3	DKN	/	/	2 1	#1 (HBD) RAN RED LIGHT STRUCK #2 (S) 94-11654
7-18-94	1000	/	DYL	RAIN	WET	2 1	#1 SNR.P F/C STRUCK #2 STOPPED FOR RED LIGHT (N) 94-17128
8-8-94	1235	4	DYL	/	/	1 2	#1 RAN RED LIGHT STRUCK #2 (S) 94-19163
8-23-94	0600	3	DAWN	/	/	1 2	#2 RAN RED LIGHT STRUCK #1 (S) 94-20574

CARD 2

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: SOUTHERN AVENUE (STOP) (YIELD) (SIGNAL) @ 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
10-21-94	1640	/	DYL	/	/	1 2	#1 PASSING ON RIGHT TO MAKE RIGHT TURN STRUCK #2 MAKING R/TURN 94-25717

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: SOUTHERN AVENUE (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
5-10-95	0504		DAWN			1	#1 (LSOA) RAN OFF ROAD STRUCK SIGNAL / POWER POLE (L) 95-1075
5-15-95	1537	2	DYL			2 1	#1 RAN RED LIGHT STRU #2 (S) 95-1123
9-9-95	1809	2	DYL			1 2	#1 RAN RED LIGHT STRUC #2 (S) 95-2155

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: SOUTHERN AVENUE (AT:) 51ST AVENUE
(STOP) (YIELD) (SIGNAL) (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
1-19-96	1258		DYL			2 1	#1 F/C MAKING RIGHT TURN STRUCK SIGNAL (N) 96-01579
4-27-96	1245		DYL			2 1	#1 (DWI) RAN RED LIGHT STRUCK #2 STOPPED TO MAKE L/TURN (N) 96-10625
7-18-96	0720	2	DYL			2 1	#2 MAKING WIDE RIGHT TURN STRUCK #1 SNEAP (N) 96-18351
10-29-96	0550	3	DKN			1 2	#1 F/VEW MAKING LEFT TURN STRUCK #2 (S) 96-27461
12-20-96	1615		DYL			1 2	#1 F/VEW MAKING LEFT TURN STRUCK #2 (S) 96-31855

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: BASELINE ROAD (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
3-21-94	0815	3	DYL	/	/	2 1	#1 RAN STOP STRUCK #2 (S) 94-06426
4-24-94	1848	/	DUSK	CLOUDY	/	2 1	#1 & #2 STRUCK (S) 94-09253
10-7-94	0400	/	DKN	/	/	2 1	#1 (LSOA) F/C STRUCK #2 STOPPED FOR STOP SIGN (N) 94-24580

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: BASELINE ROAD (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
1-23-95	1140	/	DYL	CLOUDY	/	2 1	#1 (LSOA) STRUCK #2 STOPPED FOR STOP SIGN (N) 95-0173
5-18-95	0830	/	DAWN	/	/	1 2	#1 (LSOA) F/C BACKING UP STRUCK #2 (N) 95-11495
7-17-95	0212	4	DKN	/	/	2 1	#1 (HBD) SNR.P F/C RAN STOP STRUCK #2 STOPPED FOR STOP SIGN (N) 95-11669

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: BASELINE ROAD (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
3.14.96	0940	/	DYL	RAIN	WET	1 → 2	#1 FYRW FROM STOP STRUCK #2 (S) 96-0654[illegible]

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: DOBBINS ROAD (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
3-8-94	1746	/	DYL	/	/	2 1	#1 + #2 BOTH MAKING LEF TURNS STRUCK (N) 94-0540

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: ELLIOT ROAD (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
3-12-95	1645	/	DYL	/	/	↑2 ↑1	#1 INATTENTION F/C STRUCK #2 STOPPED TO MAKE L/T (N)95-0377
6-22-95	1750	/	DYL	/	/	1 2	#1 FYRW MAKING LEFT TURN STRUCK #2 (S)95-14537

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: ELLIOT ROAD (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
1-30-96	0821	/	DYL	Cloudy	/	2 1	#1 F/C BACKING UP STRUCK #2 (N) 96-02573

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: ESTRELLA DRIVE (STOP) (YIELD) (SIGNAL) @ 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
6-16-94	1547	/	DYL	/	/	1 2	#1 PASSING IN NO PASSING ZONE STRUCK #2 MAKING LEFT TURN (N) 94-14030

6400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: ESTRELLA DRIVE (STOP) (YIELD) (SIGNAL) @ 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
3-23-95	1611	2	DYL	/	/	1 2	#1 FYRW FROM STOP STRUCK #2 (S)95-06787

8400-038

MARICOPA COUNTY HIGHWAY DEPARTMENT
Traffic Engineering Division

ACCIDENT LOCATION

ON: ESTRELLA DRIVE (STOP) (YIELD) (SIGNAL) AT: 51ST AVENUE (STOP) (YIELD) (SIGNAL)

DATE	HOUR	SEV.	LIGHT	W/S	Rd Cond	TYPE	REASONS AND CAUSES
7-19-96	0545	F_1	DAWN			2 1	#1 (DWJE) RAN STOP STRUCK #2 (N) 96-1844
8-2-96	2329	96_2	DKN			2 1	#1 (HBD) RAN STOP STRUCK #2 (S) 96-1967
12-9-96	1642	3	DYL			1 2	#1 MAKING LEFT TURN STRUCK #2 PASSING ON LEFT (N) 96-3081

MCDOT Signal Warrant Table

(ix) ADT volume warrant. This warrant applies at a new intersection, an intersection revised by a highway construction project, or at the driveway of a new commercial or residential development, and is met when either of the following requirements are satisfied:

(A) The estimated ADT on the major street and on the higher volume minor street or driveway approach to the intersection equals or exceeds the values in the following table:

Lanes for Moving Traffic on Each Approach		Estimated ADT*	
Major Street	Minor Street	Major Street (both approaches)	Minor Street (one approach)
1	1	10,000	3,000
2 or more	1	12,000	3,000
2 or more	2 or more	12,000	4,000
1	2 or more	10,000	4,000
1	1	15,000	1,500
2 or more	1	18,000	1,500
2 or more	2 or more	18,000	2,000
1	2 or more	15,000	2,000

*Based on the volume projected to be present within 2 years of the opening of the highway or within 6 months of the opening of the development.

TAB

REGARDING:	51st Avenue Safety Improvement Study
DATE:	April 29, 1997
PROJECT NUMBER:	KM Job No.: M970294
PERSONS INVOLVED:	Tom Phelan, MCDOT Bruce Ward; MCDOT Tony Chavez; MCDOT Barry Ling; KM Jonathan Kiser; KM John Willett; KM
DISTRIBUTION:	Attendees, file

General Discussion:

A meeting was held to discuss MCDOT comments on the ***DRAFT 51st Avenue Safety Improvement Study.*** The following is a list of comments and/or requests from the County regarding the report:

- ✓ Use $15,000 per acre for right-of-way acquisition costs.
- ✓ Show estimated lump sum cost of $110,000 to purchase Laveen store, parcel of land and relocation of building.
- ✓ Include a discussion about the potential store relocation in the text.
- ✓ Utilize costs from the MCDOT office memo as bullet items following right-of-way table.
- ✓ Recommend realignment of 51st Avenue north of Baseline Road to avoid existing store.
- ✓ Mention that gas tanks exist at the gas station north of Baseline, determine whether or not gas tanks exist at the Laveen County Store and include a discussion of gas tanks in the Environmental section of the report.
- ✓ The low cost alternative should include a five lane roadway section (four lane with raised median) from Baseline Road to Broadway Road and three lanes from Elliot Road to Baseline Road per the cross section provided. The three lane cross section from Elliot Road to Baseline Road is anticipated to be constructed by sawcutting, matching and then chip sealing the existing asphalt. Widen 51st Avenue at Estrella and Dusty Lane for turn lanes only.
- ✓ The high cost alternative should include costs for the extension of culverts. State that drainage study will be conducted at the design stage in the absence of a drainage report. High cost alternative will also include three lane section from Pecos Road to Elliot Road and the widening of Southern Avenue to five lanes at its intersection with 51st Avenue.
- ✓ In the absence of a drainage report, the cost for drainage was assumed to include doubling the amount of east/west drainage across or under 51st Avenue that currently exists.
- ✓ The three lane section will be constructed by sawcutting 12 feet off the centerline and adding 12 feet of asphalt to match the Rural Collector Cross Section.
- ✓ Baseline Road is widening to five lanes at 51st Avenue as part of a separate project.
- ✓ Dobbins is not planned to warrant widening to five lanes at 51st Avenue by 2015.
- ✓ MCDOT has been granted right-of-way through the reservation.
- ✓ Mention that a signed school crossing exists on 51st Avenue south of Dobbins Road.
- ✓ The casino is planned to open in October, 1997.
- ✓ The annual growth rate utilized in this study was based on historical traffic volumes in the study area.
- ✓ Use more maps to show traffic volumes graphically.
- ✓ Distribute casino traffic volumes onto east/west streets based on existing traffic patterns.

Discussion Con't.

- ✓ Utilize a percentage casino traffic assignment of 85% north/15% south on 51st Avenue.
- ✓ Explain in more detail how hourly turning volumes were calculated.
- ✓ Differentiate in the text whether the peak hour analyzed is the AM or PM peak.
- ✓ Alter the accident summary table for MCDOT to footnote the contributing factors section of table.
- ✓ Check the table that calculates accident rates to verify accuracy.
- ✓ Include a figure for both high cost and low cost intersection configurations.
- ✓ The casino is planned to gain access to 51st Avenue 400 to 600 feet south of Dusty Lane; include a casino intersection in analysis sections.
- ✓ Check signal warrant table to see if accident warrants are actually met.
- ✓ Discuss how volume warrants were evaluated.
- ✓ Request specific accident records at St. Johns and Pecos Road at 51st Avenue and also on fatality accidents. Send a copy of accident summary table to explain County's interest to Bureau of Indian Affairs.
- ✓ Show alternative alignment of St. Johns Road on an aerial photograph.
- ✓ Provide retention for 25-year storm in drainage calculations.
- ✓ Pavement in intersections within three lane pavement section will be totally replaced depending on existing asphalt conditions. Evaluate existing pavement conditions at these intersections in the report.
- ✓ Include in text of report that left turn lanes and median openings will be constructed at 1/4 mile locations on 51st Avenue.
- ✓ Use $12,000 for relocation of 69kv poles and $7,000 for relocation of 12kv poles for overhead electric lines.
- ✓ A public meeting is scheduled for 7:00 p.m. on Wednesday, May 7th in the cafeteria of the public school located in Laveen southeast of the 51st Avenue/Dobbins Road intersection.
- ✓ Use a 10% contingency on utility costs.
- ✓ Separate power costs from irrigation costs in table of improvement costs.
- ✓ Mention the relocation of the sewer lift station on the south side of the Salt River adjacent to the west edge of 51st Avenue.
- ✓ Research the well numbers for existing well sites between Baseline Road and Southern Avenue.
- ✓ Use 65 feet of right-of-way from Baseline Road north to Broadway Road.
- ✓ Discuss with ADOT when construction on I-10 between SR 60 and Riggs Road will be complete.
- ✓ Discuss how traffic patterns may shift when freeway construction ends and casino traffic begins.

MCDOT provided the following items in the meeting for use in the 51st Avenue Safety Improvement Study:

- ✓ A memorandum documenting costs associated with cost per acre for right-of-way acquisition, the potential relocation of the Laveen Country Store, and the removal of the abandoned home north of Dobbins Road on 51st Avenue.
- ✓ Maricopa County Signal Warrant Guidelines based on daily traffic volumes.
- ✓ Roadway cross section figures.
- ✓ A new site location map on a single page instead of three pages.
- ✓ Existing and proposed bridge cross section exhibits for the 1,600 foot bridge over the Salt River.

NOTE: Please fax any meeting summary comments you may have detailing errors or ommissions in this document to the attention of Sheila Wagoner, by May 12, 1997, at 944-6592

KIRKHAM MICHAEL **meeting documentation**

REGARDING:	51st Avenue Safety Improvement Study
MEETING DATE:	June 11, 1997
PROJECT NUMBER:	KM Job No.: M970294 MCDOT Job No.: 68913
PERSONS INVOLVED:	Tom Phelan, MCDOT Don Wiltshire; MCDOT Jonathan Kiser; KM John Willett; KM
DISTRIBUTION:	Attendees, file

General Discussion:

The meeting was called by MCDOT to discuss report comments and request additional work items. The following items were discussed as report comments (same of which are additional services):

- Revise the pedestrian section of the report to a multimodel section with a discussion on MAG bike paths, bus routes, a pedestrian overpass and bike lanes.
- Include the cost of removing and relocating the existing well sites between Broadway Road and Baseline Road in the Irrigation Cost Tables.
- Show acquisition of right-of-way from the west side of 51st Avenue from Baseline Road to Broadway Road. Include this item as Low Cost Alternative B.
- Right-of-way acquisition from west side of 51st Avenue should reduce relocation of 69 kv utility poles and 12 kv utility poles.
- Shifting the acquisition of right-of-way to the west should allow for the curve in 51st Avenue south of the Salt River to be straightened out.
- Extend the right-of-way map south to Dusty Lane.
- Detail the transition in rights-of-way and section lines at the GRIC border/Dusty Lane.
- Update 2020 volumes outlined in the report to reflect MAG volumes with the addition of casino traffic.
- MCDOT will provide MAG 2020 volumes and additional color figures if necessary.
- Bold text specified in report.
- Recommend a new signal warrant study if Pecos Road and St. Johns Road are realigned.
- Cost estimate should include saw cutting and widening with 4"AC/10"ABC with a rubberized chip seal over entire 3 lane improved section and at left turn widening areas. MCDOT will provide unit cost for rubberized chip seal.
- Conduct additional research on area traffic volumes to determine a more appropriate annual area growth rate.
- Submit a proposal to complete all additional work items outlined in the meeting.

NOTE: Please fax any meeting summary comments you may have detailing errors or missions in this document to the attention of Sheila Wagoner, by June 30, 1997, at 944-6592

KIRKHAM MICHAEL **meeting documentation**

REGARDING:	51st Avenue Safety Improvement Study
MEETING DATE:	August 28, 1997
PROJECT NUMBER:	KM Job No.: M970294
PERSONS INVOLVED:	Tom Phelan, MCDOT Dave Wolfson; MCDOT Bruce Ward; MCDOT Laura Brannan; MCDOT Jonathan Kiser; KM John Willett; KM
DISTRIBUTION:	Attendees, file

General Discussion:

A discussion of the second submittal of the Safety Improvement Study comments was conducted at Maricopa County D.O.T. The following is a list of items discussed in this meeting:

- ✓ A future improvement to the area roadway network should include the analysis of a bridge constructed across the Salt River near the 59th Avenue alignment for the Safety Improvement Study.
- ✓ Use original color maps for vicinity map.
- ✓ Show recommendation to provide three lanes between Pecos Road and St. Johns Road in low cost improvement.
- ✓ State that it is beyond scope of this report to analyze realignment of St. Johns Road.
- ✓ Add table of contents to the report.
- ✓ Separate north/south and east/west growth rates to 5.1% and 6.2%, respectively.
- ✓ State that the safety concerns at the school and some traffic volume justification exists for signalization of the Dobbins Road/51st Avenue intersection in the future.
- ✓ Put the entire Truck Traffic Policy and Signal Volume Warrant Policy in the Appendix of the report.
- ✓ Eliminate 2020 volumes from Study, but state that 2020 volumes are discussed in detail in Truck Study.
- ✓ A savings exists by taking right-of-way from one side of 51st Avenue through offset area.
- ✓ Cella Bar is to collect right-of-way data and provide to MCDOT. MCDOT will forward this data to KM.

NOTE: Please fax any meeting summary comments you may have detailing errors or omissions in this document to the attention of Sheila Wagoner, by September 29, 1997, at 944-6592.

KIRKHAM MICHAEL **meeting documentation**

REGARDING:	51st Avenue Truck Study and Safety Improvement Study
MEETING DATE:	September 8, 1997
PROJECT NUMBER:	KM Job No.: M970294
PERSONS INVOLVED:	Tom Phelan, MCDOT Dave Wolfson; MCDOT Jonathan Kiser; KM John Willett; KM
DISTRIBUTION:	Attendees, file

General Discussion:

A meeting was held at Maricopa County to discuss traffic volume projections on the 51st Avenue Truck Study and Safety Improvement Study. The following is a list of comments from the discussion:

- ✓ MCDOT provided EMME2 traffic projections for 2010 with and without a bridge at the Salt River along the 59th Avenue alignment.
- ✓ Graphics from KM should show the bridge along the 61st Avenue alignment (freeway alignment).
- ✓ Updated socioeconomic data was used to develop the latest 2010 traffic volume projections.
- ✓ The 2010 volumes will be used as preliminary volumes for the Safety Improvement Study and the Truck Study.
- ✓ Casino volumes should be added to 2010 EMME2 volumes to account for the West End Casino.
- ✓ A bridge crossing at 61st Avenue will be necessary to keep traffic volumes on 51st Avenue at acceptable levels when direct access is provided between Ahwatukee and Laveen.
- ✓ The Safety Improvement Study should refer to the Truck Study for 2020 traffic volumes.
- ✓ The volumes in the Safety Improvement Study should be updated and a final report submitted.
- ✓ KM will provide figures for a traffic handout for a meeting with the Laveen Planning Committee on September 8, 1997.
- ✓ The survey/right-of-way information at the GRIC boundary has been obtained from research conducted by KM, MCDOT and Cella Bar.
- ✓ Remove the cost of the Dusty Lane widening from the cost estimate in the Safety Improvement Study.
- ✓ Redline comments on the Safety Improvement Study were delivered to KM by MCDOT.

NOTE: Please fax any meeting summary comments you may have detailing errors or omissions in this document to the attention of Sheila Wagoner, by September 29, 1997, at 944-6592 .

Open House Public Meeting

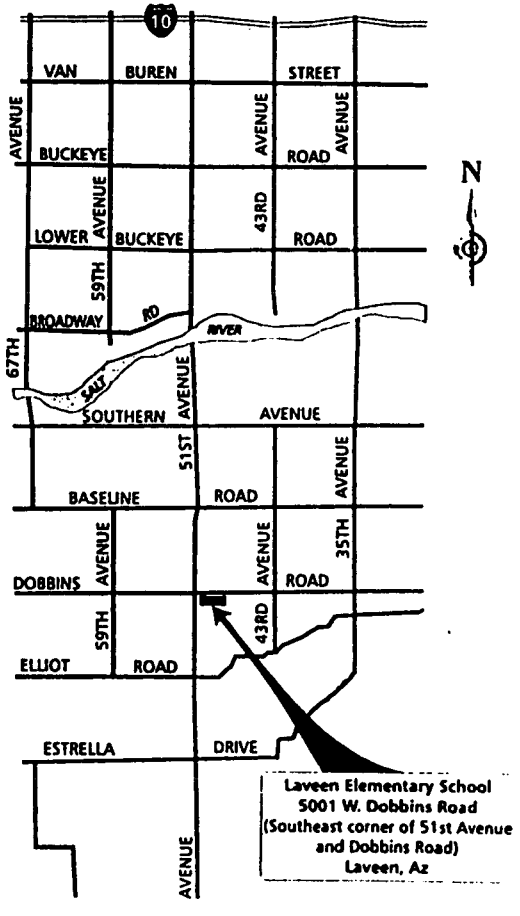
Hosted by the Maricopa County Department of Transportation

When: Wednesday, May 7, 1997, 7-9 p.m.

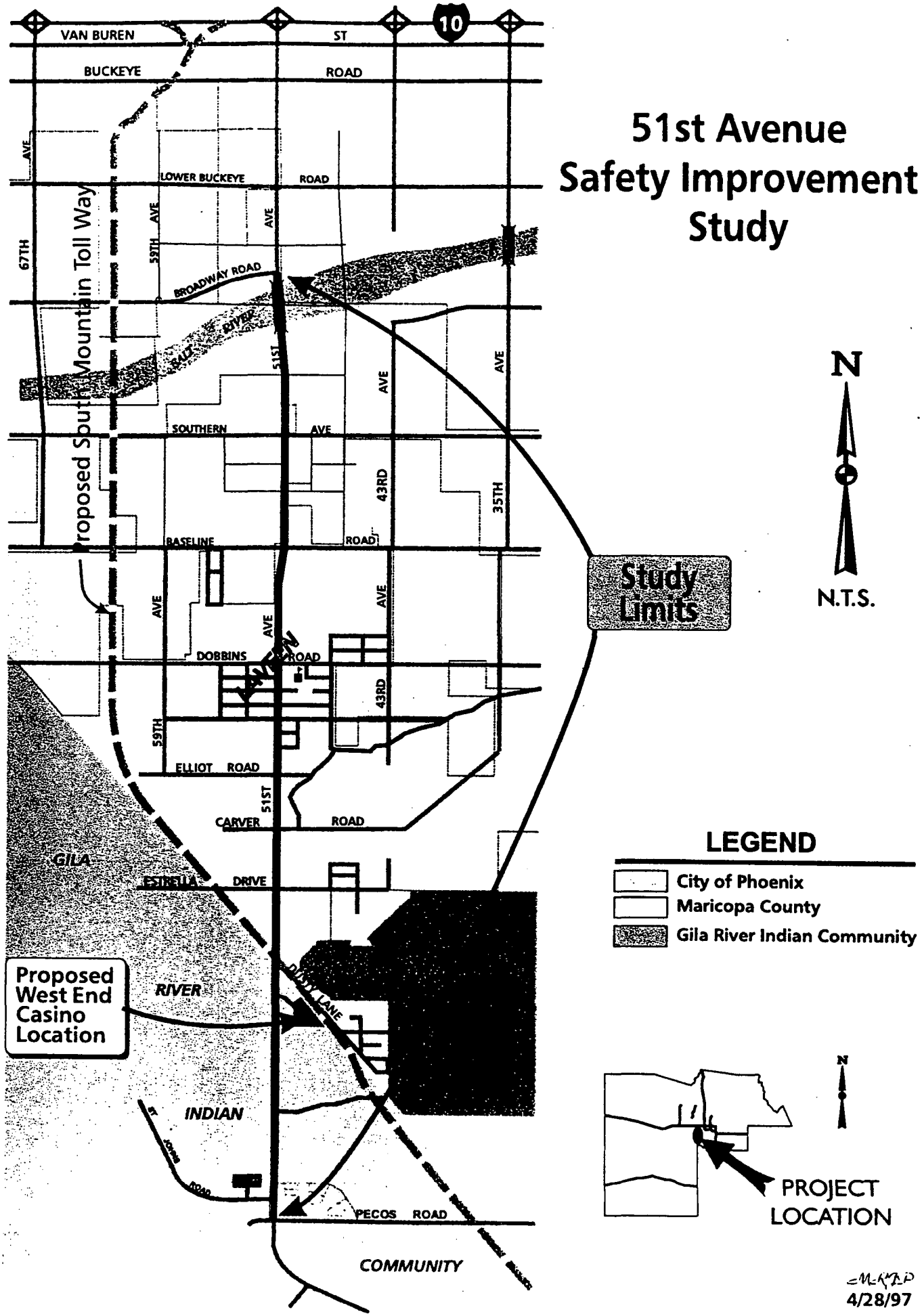
Where: Laveen Elementary School Library, 5001 West Dobbins Road, Laveen

Why: To discuss the safety study of the 51st Avenue corridor. Funds have been budgeted to widen 51st Avenue between Broadway and Baseline roads and the 51st Avenue Bridge. Other funds are budgeted for intersection and shoulder improvements between Baseline and the Gila River Indian Community boundary.

For more information, contact Bruce Ward, project manager, at 506-8681.



51st Avenue Safety Improvement Study



4/28/97

51ST AVENUE SAFETY IMPROVEMENT STUDY

BROADWAY ROAD TO THE GILA RIVER INDIAN COMMUNITY BOUNDARY

INFORMATION SHEET

- 51st Avenue in the study area serves as a major access road to the Laveen Community and Gila River Indian Community in the southwestern part of the metropolitan Phoenix area. It is also used as a minor link for travel between western Phoenix and Interstate 10 south of the Auwatuke area.

- Plans recently were announced by the Gila River Indian Community to open a casino on 51st Avenue south of the northern border of the Gila River Indian Community. Additional traffic is expected on 51st Avenue as a result of this new facility.

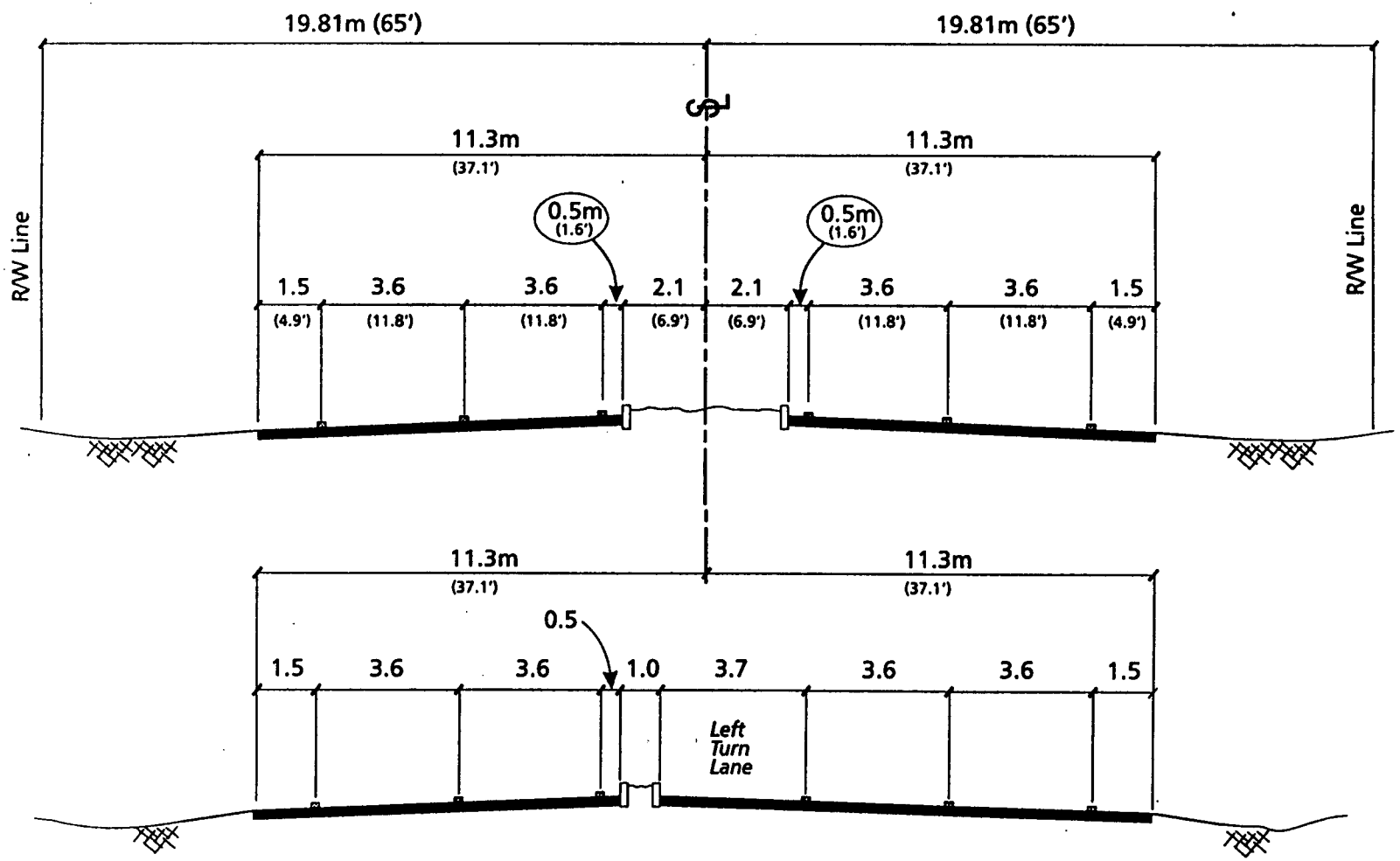
- A safety study of the 51st Avenue corridor in the southwestern Phoenix metropolitan area has been initiated by the Maricopa County Department of Transportation in cooperation with the Laveen Planning Committee and the City of Phoenix. The intention of the study is to identify traffic control and roadway improvements along 51st Avenue that can more effectively handle traffic between the years 1998 and 2005.

- It is anticipated that by 2005 or earlier the Arizona Department of Transportation will have developed through a privatization inititive or by direct ADOT design and construction an expressway or freeway within a majority of the South Mountain Freeway corridor.

- Funds have been budgeted by Maricopa County in the fiscal year that begins July 1999, for the widening of 51st Avenue to a five lane road between Broadway and Baseline including the widening of the 51st Avenue Bridge at the Salt River.

- Funds have been budgeted in the fiscal year that begins July 1997 for improved traffic control, widening of intersections and paved shoulder improvements between Baseline and Elliot and for intersection widening at the Estrella intersection.

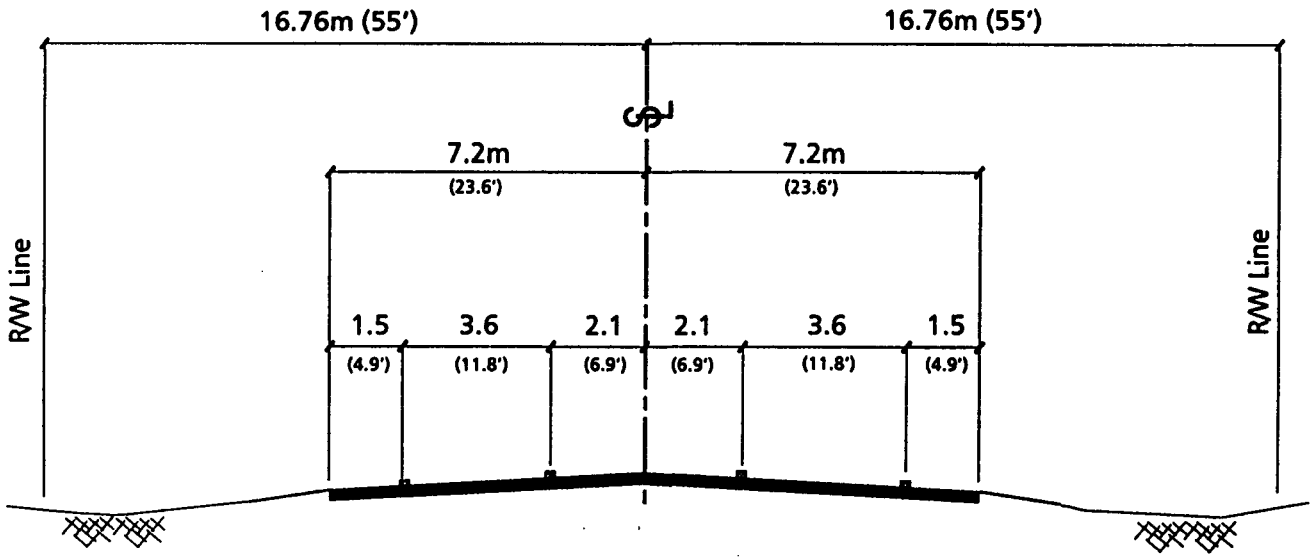
- Comments on the proposed improvements are welcome. Please send your comments to Mr. Bruce Ward, P.E., Project Manager, Maricopa County Department of Transportation, 2901 West Durango, Phoenix, Arizona, 85009.



Rural Arterial Road Cross Section With Four Lanes and Raised Median
22.6m (74.2') Paved Width

51st Avenue
Baseline Road to Broadway Road

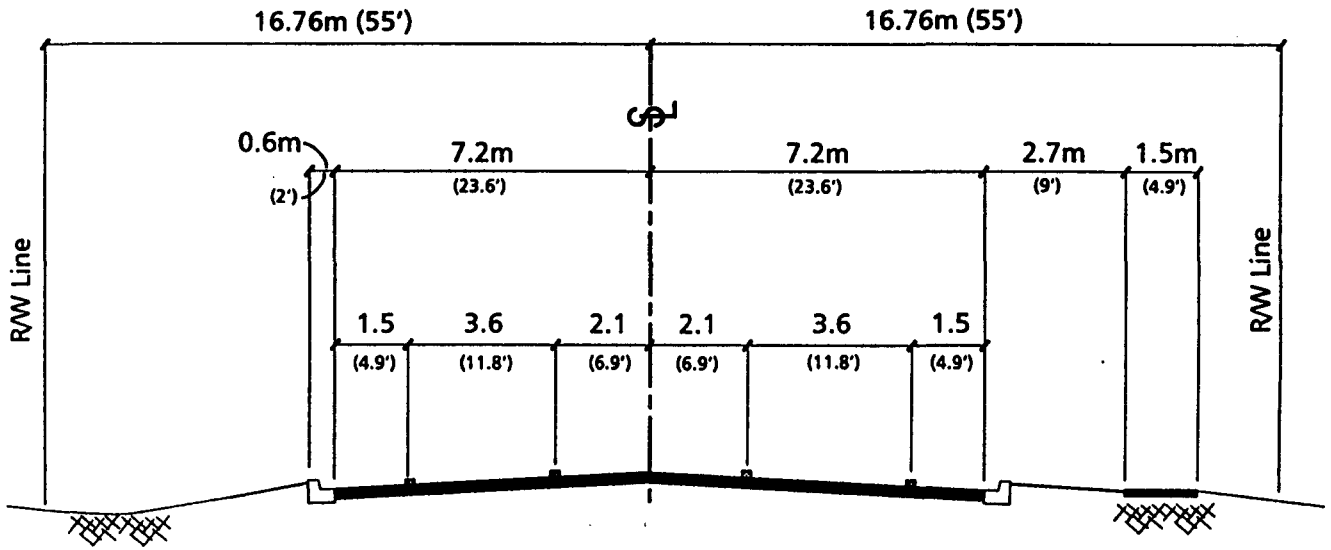
MRTP



Rural Collector Road Cross Section With Three Lanes Including a Continuous Two Way Left Turn Lane

51st Avenue
Elliot Road to Baseline Road

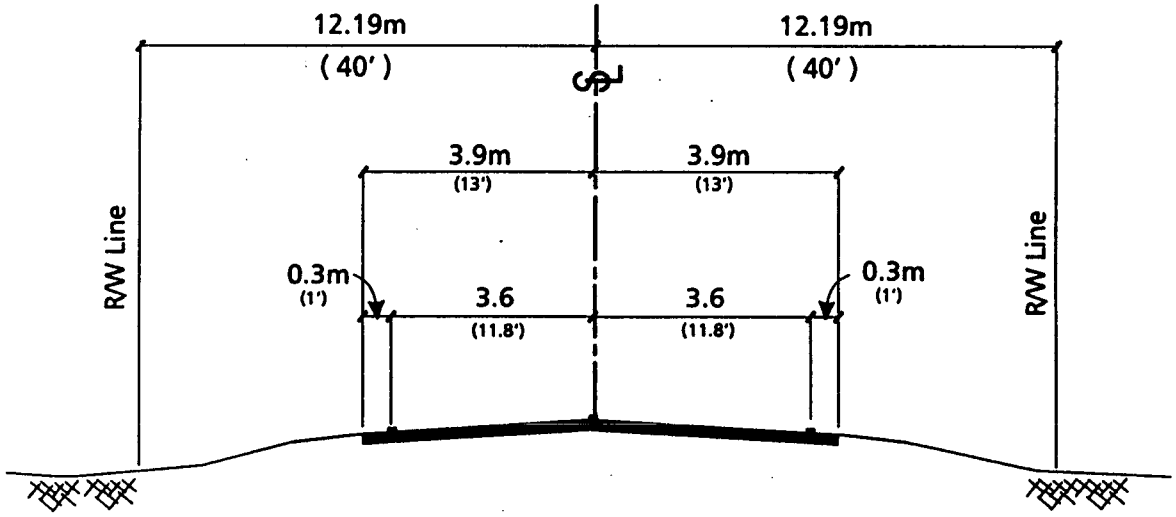
5/07/97

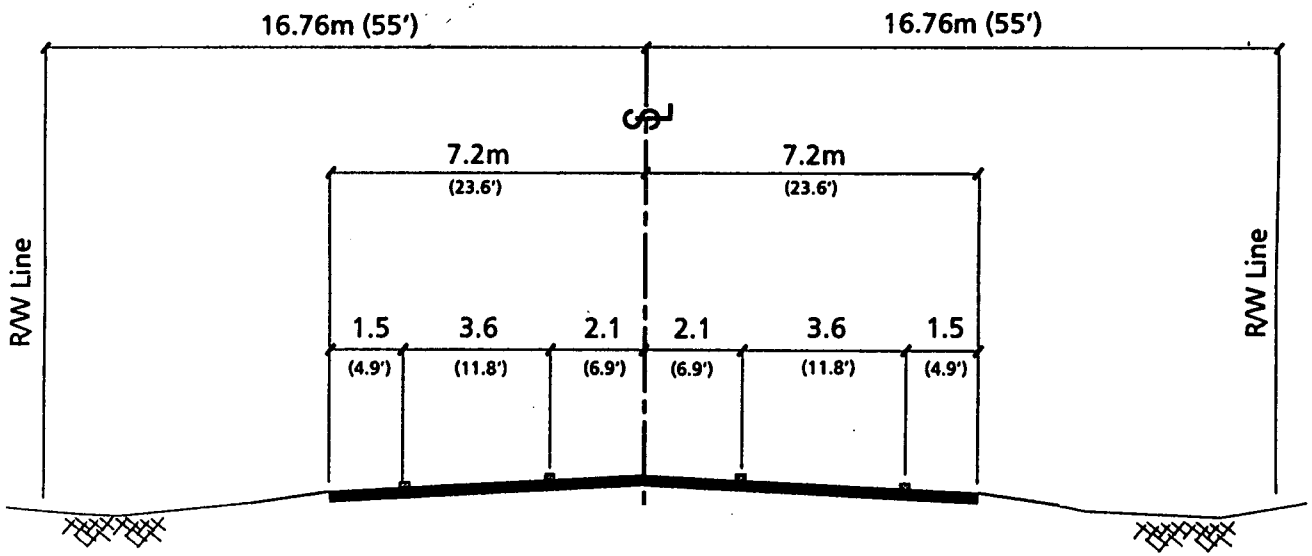


Urban Collector Road Cross Section With Three Lanes Including a Continuous Two Way Left Turn Lane

51st Avenue
Vicinity of Dobbins Road Intersection

MRJP
5/05/97





Two Lane Rural Collector Road Cross Section With Widening at Estrella and Dusty Lane

51st Avenue
Dusty Lane to Elliot Road

MRJP
5/07/97

PEDESTRIAN OPTIONS IN VICINITY OF DOBBINS ROAD

PEDESTRIAN OVERPASS

ADVANTAGES

- Full separation from street traffic provides users with an opportunity for a very safe crossing of street.

DISADVANTAGES

- Structure must meet requirements for persons with disabilities requireing approximately 200' of inclined ramps at each end.
- Experience is that less than 50% of pedestrians use the overpass, others cross at street level.
- Structure cost in range of $250,000 to $350,000 removes funding from other needed improvments in the area.

SIDEWALK AND SIGNALIZED INTERSECTION

ADVANTAGES

- Ease of use.
- Intersection visibility and control to provide safety.
- High percentage of actual use by pedestrians.
- Cost Advantage over grade separated overpass structure.

DISADVANTAGES

- Pedestrians and vehicles cross at same surface level.

51st Avenue Gila River Indian Community to Baseline Road
MCDOT Work Order No. 68913

Summary of Comment Cards

On May 7, 1997, nearly 60 people attended a public meeting to discuss the 51st Avenue project. Comment cards were distributed to all those that attended the meeting. The following information is a summary of the respondents' comments:

Results

As of May 9, MCDOT received feedback from 30 citizens. Of those who responded 33 percent said truck traffic should be diverted away from 51st Avenue. The reasons cited were increased traffic, noise and safety concerns for neighborhood children. In fact 13 percent expressed concern with school children crossing 51st Avenue at Dobbins. Roughly 17 percent said speed limits should be reduced and ten percent want stop signs erected at intersections.

Approximately 17 percent would like 59th Avenue improved instead of 51st Avenue; and ten percent would like the freeway completed. However, if 51st Avenue is improved; seven percent of the respondents want right-of-way purchased from the west side of the street and seven percent requested an equestrian trail.

With regard to the meeting, a sampling of the comments included:

- "...local traffic... will soon swamp our little 51st Avenue."
- "Special concerns need to be addressed for safe pedestrian access for school children across 51st Avenue and Dobbins."
- "(Improve) 59th Avenue instead of 51st Avenue."
- "...discourage trucks from using 51st Avenue."
- "Truck traffic needs to be diverted totally from the community and the school area-improving (51st Avenue) only makes it more attractive for truck traffic..."
- "Keep our rural neighborhood rural."
- "...establish 59th Avenue as the main thoroughfare, that will eliminate much of the unwanted non-community traffic."

DRAFT

51st Avenue, Gila River Indian Community to Baseline Road
MCDOT Work Order No. 68913
Summary of Citizen Comments

Comments	Number of Respondents
Staff very knowledgeable	7
Staff somewhat knowledgeable	12
Staff not very knowledgeable	1
Staff very helpful	13
Staff somewhat helpful	4
Staff not very helpful	1
Information presented in an understandable manner	17
Information not understandable	5
Questions answered	21
Questions not answered	2
Requested future information	20
Future information not needed	4
Heard about the meeting from:	
Newspaper	1
Radio	0
Flyers	22
Trail signs	1
Friends/Neighbors	8
Other	5

MCDOT LOS TABLE ON P 2-5 IS BASED ON AASHTO, Geometric Design of Highways, 1990

P 88-89 AASHTO, 1994

TWO LANE ROADWAY

LOS	2-Way hourly volume	SPEED mph	SPEED KM/h	2-Way Daily Volume*
A	420	≥58	93	4,200 vpd
B	750	≥55	88	7,500 vpd
C	1200	≥52	84	12,000 vpd
D	1800	≥50	80	18,000 vpd
E	2800	45	72	28,000 vpd
F	2800	<45	<72	>28,000 vpd

*- BASED ON 10% K FACTOR.

LOS B Threshold volume of 7,500 vpd is close to the 8,000 vpd outlined in MCDOT's Roadway Design Manual for LOS B on a rural major collector.

Per KM's previous analysis, 3 lane roadway is conservatively assumed to have a capacity 20% greater than a 2 lane roadway.

Los	3 Lane Road Daily Volume (2-way)
A	5,040 vpd
B	9,000 vpd
C	14,400 vpd
D	21,600 vpd
E	33,600 vpd
F	>33,600 vpd

4 Lane Roadway Capacity per AASHTO 1994, p 88,89

LOS	2 way hourly volume	SPEED MPH	SPEED km/h	2 way daily volume*
A	1440	>60	>96	14,400
B	2400	>60	>96	24,000
C	3300	>59	>95	33,000
D	3880	>58	>92	38,800
E	4400	55	>88	44,000
F	>4400	<31	<50	>44,000

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

TAB

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

RIGHT-OF-WAY DIVISION

MEMORANDUM

DATE: April 18, 1997

TO: Tom Phelan

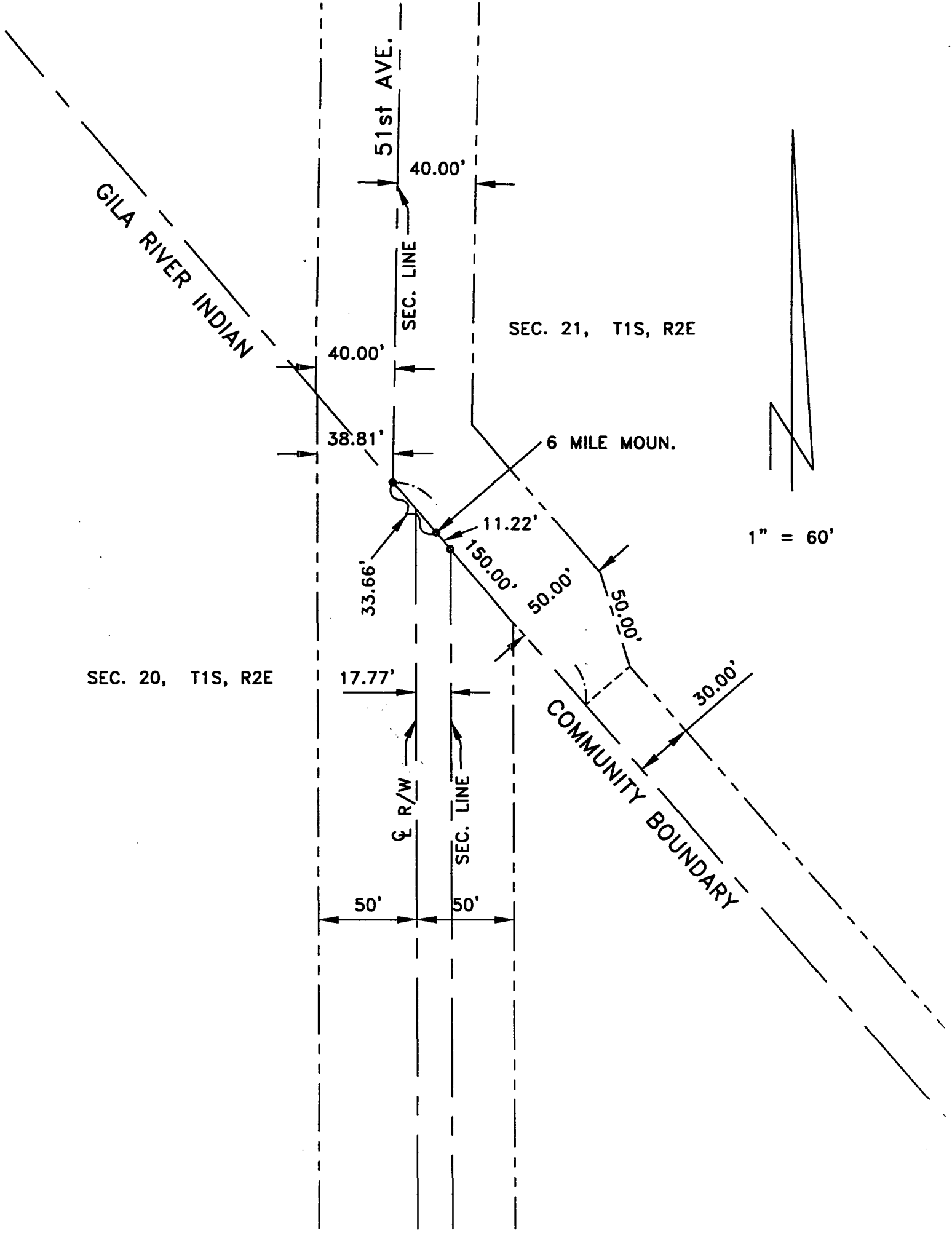
FROM: Tony Chavez TC 4-18-97

SUBJECT: 51st Avenue Safety Improvement study

Per your request, I have the following comments:

1. Estimated R/W value is $15,000 per acre (page 28).	
2. Total estimated land cost, 16.0 acres @ $15,000 (page 31)	= $240,000
3. Estimated cost to purchase store	= $100,000±
4. Estimated relocation cost	= $ 10,000
5. Estimated value of house north of Dobbins Road	= $ 0
6. Estimated title & escrow fees (64 parcel @ $700)	= $ 44,800
Estimated Total (Table 7.3.1)	= $394,800

51stave.doc


51st AVE.
40.00'
GILA RIVER INDIAN
SEC. LINE
SEC. 21, T1S, R2E
40.00'
38.81'
6 MILE MOUN.
11.22'
150.00'
33.66'
50.00'
50.00'
1" = 60'
SEC. 20, T1S, R2E
17.77'
30.00'
COMMUNITY BOUNDARY
℄ R/W
SEC. LINE
50'
50'

Recorded at Request of Board of Supervisors.

261130

R.F. 2182

D-11008

County of Maricopa

State of Arizona

Office of the Clerk

State of Arizona }
County of Maricopa } ss.

I, Rhea Woodall, Clerk of the Board of Supervisors do hereby Certify That the following is a true and correct extract from the minutes of the Board of Supervisors' meeting held September 18, 1972:

AUTHORIZATION OF ASSIGNMENT OF CERTAIN BUREAU OF INDIAN AFFAIRS ROADS TO MARICOPA COUNTY:

In accordance with recommendation by the County Engineer, Mr. Haws made the motion, which was unanimously carried, that the Board authorize the assignment of certain Bureau of Indian Affairs roads to Maricopa County. Included with this assignment is Gila River Indian Community Resolution No. GR-39-72, which grants to Maricopa County materials for road maintenance and future construction without any monetary consideration.

STATE OF ARIZONA }
County of Maricopa } ss

I hereby certify that the within instrument was filed and recorded at request of
ARICOPA CO. BD. OF SUPERVI...

OCT 4 1972 -10 30

in Docket 9737

on page 814-816

Witness my hand and official seal the day and year aforesaid.

Paul N. Marston
County Recorder

By Alyce Kettner
Deputy Recorder

In Witness Whereof, I have hereunto set my hand and affixed the Official Seal of the Board of Supervisors. Done at Phoenix, the County Seat this 19th day of September A.D. 1972

County Engineer
File

B I A
30 30 N Centre

Rhea Woodall
Clerk of the Board of Supervisors

R/W Secs 20-21 & South

Exp. GR-3-1
Misc 28C
RF 2182

9737 815

ASSIGNMENT OF ROAD RIGHT OF WAY

WHEREAS, the United States Department of the Interior, Bureau of Indian Affairs, Phoenix Area Office, Phoenix, Arizona, on April 24 1972, made application pursuant to the Act of February 5, 1948 (62 Stat. 17, 25 USCA 323-328) and in accordance with Departmental Regulations 25 CFR 161 and 162, for a road right-of-way 100 feet where noted & 80 feet where noted feet in width and 3.908 miles in length across restricted tribal lands and individual lands of the Gila River Indian Reservation, Arizona, such right-of-way to be granted to the United States, its successors and assigns, with the right to construct, maintain, and repair improvements, thereon and thereover, for such purposes and with the further right in the United States its successors and assigns, to transfer said right-of-way by assignment, grant, or otherwise, and

WHEREAS, the Gila River Indian Community, by Resolution No. GR-259-66 dated December 9, 1966, consented to the granting of a right-of-way to the above named-applicant for a road to be constructed on and across tribal lands without the payment of any consideration for damages, and to the subsequent transfer of said right-of-way by assignment, grant, or otherwise, and

WHEREAS, the Acting Superintendent, Pima Agency, Sacaton, Arizona, on April 26, 1972, granted the applicant an easement for a right of-way which was requested in its application of April 24, 1972, and which is more particularly described and delineated in the Grant of Easement and on the map of definite location filed by the applicant as a part of its application, and

WHEREAS, the Board of County Supervisors of Maricopa County has agreed to accept jurisdiction with respect to the future maintenance of the road and related improvements covered by the aforementioned grant of easement, subject to certain conditions as set forth in said resolution of the Gila River Indian Community.

NOW, THEREFORE, the United States Department of the Interior, Bureau of Indian Affairs, Phoenix Area Office, Phoenix, Arizona, owner of the right-of-way referred to herein, hereby transfers, assigns and conveys all of its right, title, and interest in and to said right-of-way, subject

to the approval of the Secretary of the Interior or his authorized representative, to Maricopa County, Arizona, without any monetary consideration.

Said assignment shall be effective from the date of the approval hereof by the Secretary of the Interior or his authorized representative.

IN WITNESS WHEREOF, the said assignor has hereunto set its hand and seal this _____ day of MAY 19 1978, 19____.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
PHOENIX AREA OFFICE

By: Charles D. Worthman
ASSISTANT AREA DIRECTOR

ACCEPTANCE BY ASSIGNEE

Maricopa County, Arizona, the assignee in the above and foregoing assignment, made subject to the approval of the Secretary of the Interior or his authorized representative, hereby accepts such assignment and agrees to fulfill all the obligations, conditions, and stipulations as set forth in Resolution No. GR-259-66 of the Gila River Indian Community and in the application dated December 9, 1966 of the United States Department of the Interior, Bureau of Indian Affairs, Phoenix Area Office, for the subject right-of-way; the rules and regulations of the Secretary of the Interior applicable thereto (25 CFR 161 and 162), except that 25 CFR 161.5(c) shall not apply since Maricopa County, Arizona, is prohibited by law from executing such a stipulation.

Maricopa County, Arizona
BOARD OF SUPERVISORS

ATTEST:

Clerk of the Board

By: _____
Chairman of the Board

Map File

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
PIMA AGENCY
Sacaton, Arizona

The requirements of 25 CFR 161.5(c) are hereby waived as to the assignee hereof and the foregoing Assignment is hereby approved.

Date 9-26-72

Superintendent

COMMISSIONER'S CERTIFICATE:

I, R.C. Esterbrooks, being County Highway Engineer of Maricopa County, State of Arizona, hereby state that I am satisfied with the accuracy of the survey and map and do hereby recommend to the icopa County Board of Supervisors an application for and acceptance of the right-of-way as delineated on map of definite location.

R C Esterbrooks
County Highway Engineer

: 8/30/72

te of Arizona } SS
nty of Maricopa }

an August 30, 1972, before me Walter Herbold, a Notary Public in and for said Maricopa nty, State of Arizona, personally appeared R.C. Esterbrooks, known to me to be the person whose name subscribed to the within instrument and acknowledged to me that he executed the same.

Walter Herbold
Notary Public

Commission Expires Sept. 8, 1975

RIGHT-OF-WAY APPLICATION AND CONVEYANCE

INTY APPLICATION:

By Maricopa County Board of Supervisors' Resolution of Application No._____ adopted September 18, 1972

ANSFER ACTION:

I, _____, Superintendent, _____ Agency, acting on behalf of the Bureau of Indian fairs and pursuant to Departmental Regulation 25 CFR 162.3, do hereby transfer this right-of-way and jurisdiction the County of Maricopa, State of Arizona.

_____
Superintendent

te:_____

ENGINEER'S AFFIDAVIT

'ATE OF ARIZONA } SS
OUNTY OF MARICOPA

GEORGE S. OVERBY, BEING FIRST DULY SWORN, DEPOSES AND STATES THAT HE IS THE AREA ROAD ENGINEER, BUREAU OF INDIAN AFFAIRS, PHOENIX AREA OFFICE, PHOENIX, ARIZONA, THAT HE HAS EXAMINED THE FIELD NOTES OF THE SURVEY FOR A IGHWAY RIGHT-OF-WAY DESCRIBED AND SHOWN ON THIS MAP; THAT THIS MAP WAS PREPARED UNDER HIS DIRECTION FROM SAID FIELD OTES; AND THAT SAID RIGHT-OF-WAY, 80 FEET IN WIDTH A DISTANCE OF 1.070 MILE, AND 100 FEET IN WIDTH A DISTANCE OF .848 MILES FOR A TOTAL DISTANCE OF 4.918 MILES BEGINNING AT ENGINEERING STATION 0+00.00 WHICH BEARS N.0°17'32"W., ,713.26 FEET FROM THE E¼ CORNER OF SEC. 29, T. 1 S., R. 2 E., GGSRB&M, ARIZONA AND ENDING AT ENGINEERING STATION 62+08.25, WHICH BEARS S.2 19'30"E., 7,368.64 FEET FROM THE NW CORNER OF SEC. 9, T. 2 S., R. 2 E., GGSRB&M, ARIZONA, ND IS ACCURATELY LOCATED ON THIS MAP, DWG. NO. GR-3-1.

George S. Overby
GEORGE S. OVERBY

SUBSCRIBED AND SWORN TO BEFORE ME THIS 29th DAY OF May, 1972

Mary M. Gilbert
NOTARY PUBLIC

MY COMMISSION EXPIRES JULY 28, 1972

APPLICANT' S CERTIFICATE

I, GEORGE S. OVERBY, DO HEREBY CERTIFY THAT I AM THE AREA ROAD ENGINEER FOR THE UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF INDIAN AFFAIRS, PHOENIX AREA OFFICE, PHOENIX, ARIZONA, HEREINAFTER DESIGNATED THE APPLICANT; THAT AS AREA ROAD ENGINEER I SUBSCRIBED THE FOREGOING AFFIDAVIT; THAT THE LOCATION OF SAID RIGHT-OF-WAY, 80 FEET IN WIDTH A DISTANCE OF 1.070 MILES, AND 100 FEET IN WIDTH A DISTANCE OF 3.848 MILES FOR A TOTAL DISTANCE OF 4.918 MILES BEGINNING AT ENGINEERING STATION 0+00.00, WHICH BEARS N.0°17'32"W., 4,713.26 FEET FROM THE E¼ CORNER OF SEC. 29, T. 1 S., R. 2 E., GGSRB&M, ARIZONA AND ENDING AT ENGINEERING STATION 262+08.25, WHICH BEARS S.2 19'30"E., 7,368.64 FEET FROM THE NW CORNER OF SEC. 9, T. 2 S., R. 2 E., GGSRB&M, ARIZONA AND IS ACCURATELY LOCATED ON THIS MAP, DRG. GR-3-1, AS SURVEYED BY ME, OR UNDER MY DIRECTION, AND THIS MAP WAS PREPARED BY ME, OR UNDER MY DIRECTION, THAT THE SURVEY AND MAP ACCURATELY REPRESENT THE LOCATION OF THE ROAD SHOWN THEREON; THAT SUCH SURVEY AS REPRESENTED ON THIS MAP HAS BEEN ADOPTED BY THE APPLICANT AS THE DEFINITE LOCATION OF THE ROAD THEREBY SHOWN; AND THAT THE MAP HAS BEEN PREPARED TO BE FILED FOR THE APPROVAL OF THE SECRETARY OF THE INTERIOR OR HIS DULY AUTHORIZED REPRESENTATIVE AS PART OF THE APPLICATION FOR SAID RIGHT-OF-WAY TO BE GRANTED THE UNITED STATES, ITS SUCCESSORS AND ASSIGNS, WITH THE RIGHT TO CONSTRUCT, MAINTAIN, AND REPAIR IMPROVEMENTS, THEREON AND THEREOVER, FOR SUCH PURPOSES, AND WITH THE FURTHER RIGHT IN THE UNITED STATES, ITS SUCCESSORS AND ASSIGNS, TO TRANSFER THIS RIGHT-OF-WAY BY ASSIGNMENT, GRANT OR OTHERWISE.

George S. Overby
GEORGE S. OVERBY, AREA ROAD ENGINEER
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
PHOENIX AREA OFFICE, PHOENIX, ARIZONA

[illegible] 4,713.26 FEET FROM THE E. CORNER OF SEC. [illegible], T. 1 S., R. 2 E., [illegible], ARIZONA, [illegible] 262+08.25, WHICH BEARS S.2 19'30"E., 7,368.64 FEET FROM THE NW CORNER OF SEC. 9, T. 2 S., R. 2 E., G&SRB&M, ARIZONA, AND IS ACCURATELY LOCATED ON THIS MAP, DWG. NO. GR-3-1.

GEORGE S. OVERBY

SUBSCRIBED AND SWORN TO BEFORE ME THIS 25th DAY OF May, 1972

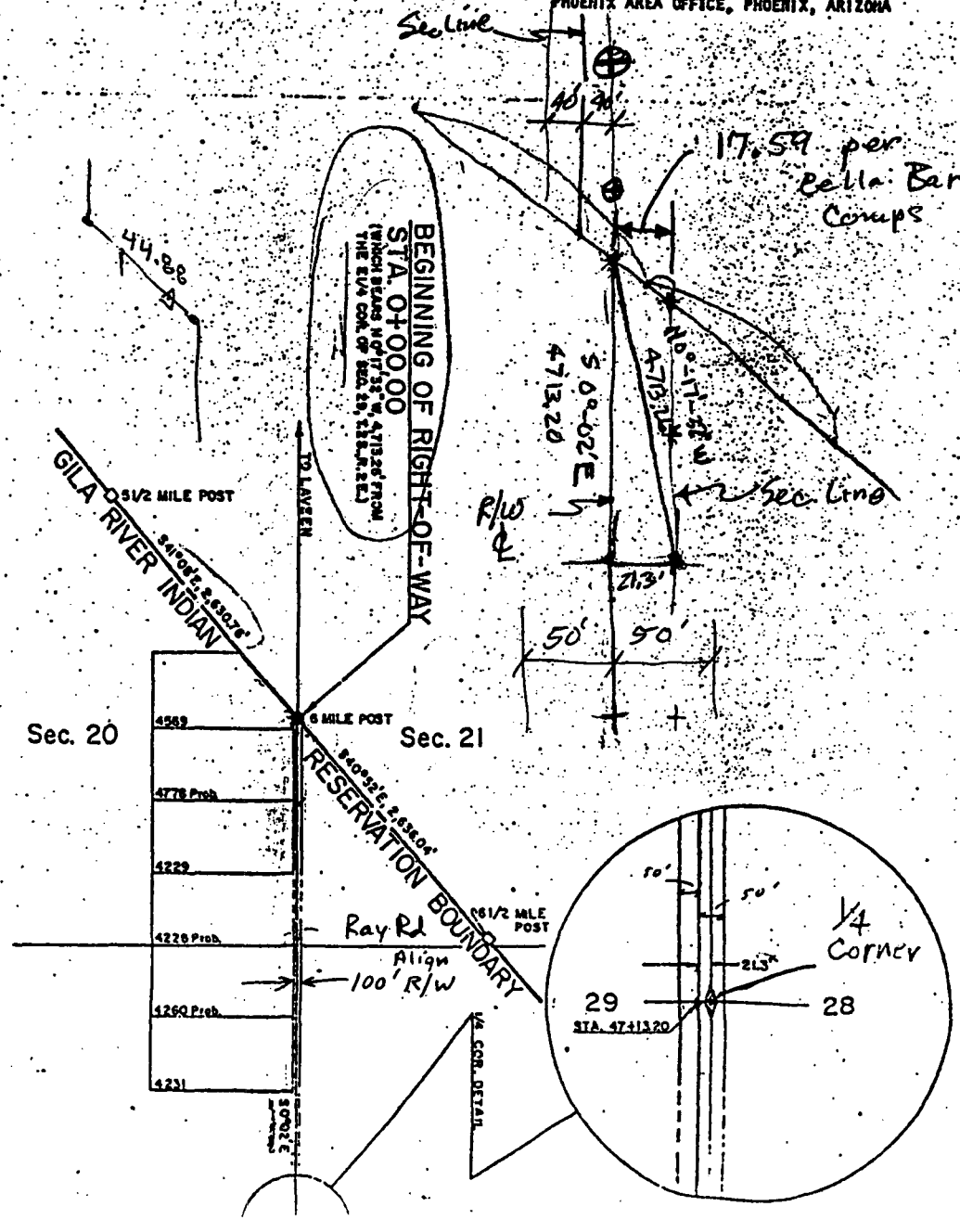
Mary M. Gilbert
NOTARY PUBLIC

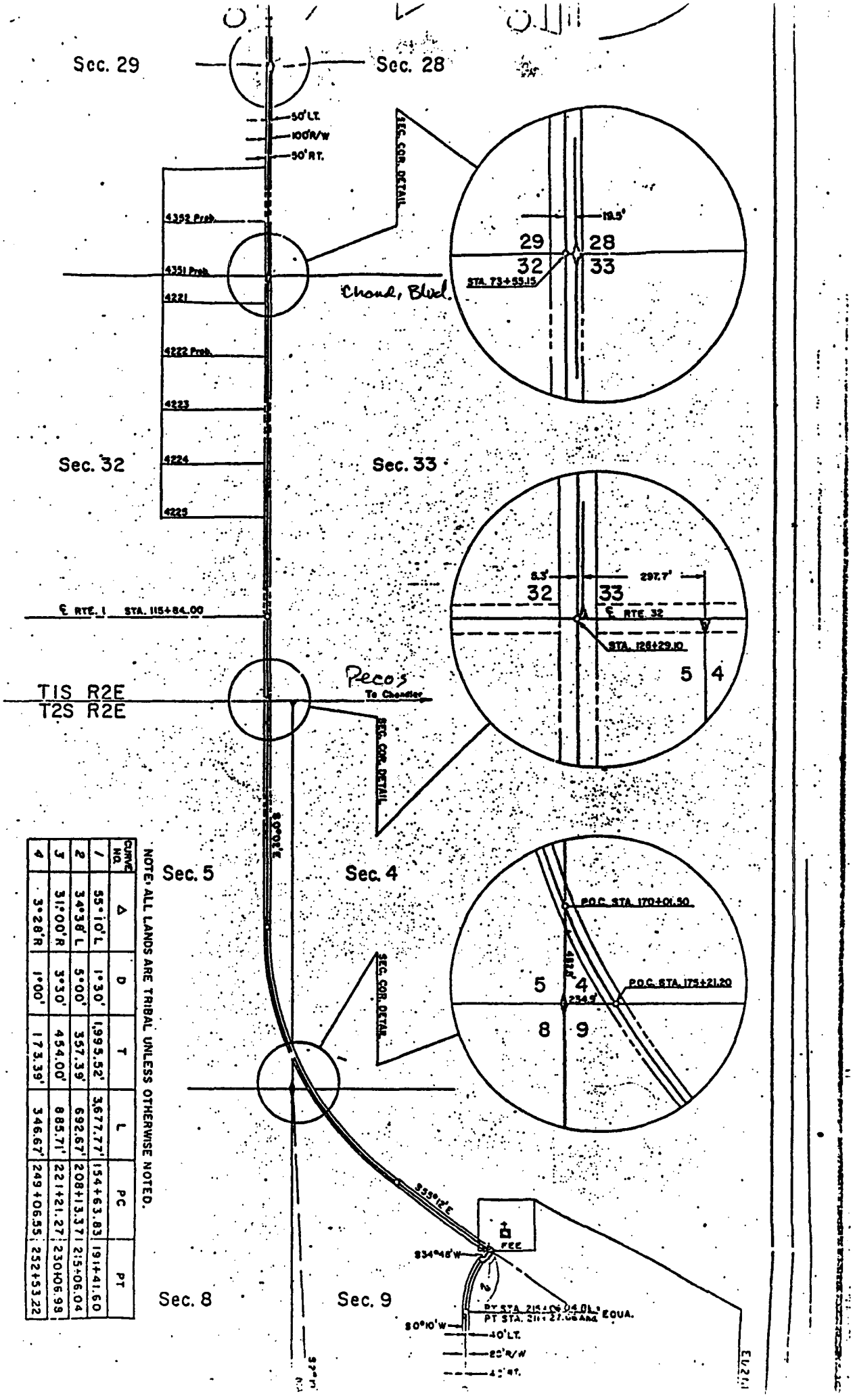
MY COMMISSION EXPIRES JULY 28, 1972

APPLICANT' S CERTIFICATE

I, GEORGE S. OVERBY, DO HEREBY CERTIFY THAT I AM THE AREA ROAD ENGINEER FOR THE UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF INDIAN AFFAIRS, PHOENIX AREA OFFICE, PHOENIX, ARIZONA, HEREINAFTER DESIGNATED THE APPLICANT; THAT AS AREA ROAD ENGINEER I SUBSCRIBED THE FOREGOING AFFIDAVIT; THAT THE LOCATION OF SAID RIGHT-OF-WAY, 80 FEET IN WIDTH A DISTANCE OF 1,070 MILES, AND 100 FEET IN WIDTH A DISTANCE OF 3.848 MILES FOR A TOTAL DISTANCE OF 4.918 MILES BEGINNING AT ENGINEERING STATION 0+00.00, WHICH BEARS N.0°17'32"W., 4,713.26 FEET FROM THE E. CORNER OF SEC. 29, T. 1 S., R. 2 E., G&SRB&M, ARIZONA AND ENDING AT ENGINEERING STATION 262+08.25, WHICH BEARS S.2 19'30"E., 7,368.64 FEET FROM THE NW CORNER OF SEC. 9, T. 2 S., R. 2 E., G&SRB&M, ARIZONA AND IS ACCURATELY LOCATED ON THIS MAP, DRG. GR-3-1, AS SURVEYED BY ME, OR UNDER MY DIRECTION, AND THIS MAP WAS PREPARED BY ME, OR UNDER MY DIRECTION, THAT THE SURVEY AND MAP ACCURATELY REPRESENT THE LOCATION OF THE ROAD SHOWN THEREON; THAT SUCH SURVEY AS REPRESENTED ON THIS MAP HAS BEEN ADOPTED BY THE APPLICANT AS THE DEFINITE LOCATION OF THE ROAD THEREBY SHOWN; AND THAT THE MAP HAS BEEN PREPARED TO BE FILED FOR THE APPROVAL OF THE SECRETARY OF THE INTERIOR OR HIS DULY AUTHORIZED REPRESENTATIVE AS PART OF THE APPLICATION FOR SAID RIGHT-OF-WAY TO BE GRANTED THE UNITED STATES, ITS SUCCESSORS AND ASSIGNS, WITH THE RIGHT TO CONSTRUCT, MAINTAIN, AND REPAIR IMPROVEMENTS, THEREON AND THEREOVER, FOR SUCH PURPOSES, AND WITH THE FURTHER RIGHT IN THE UNITED STATES, ITS SUCCESSORS AND ASSIGNS, TO TRANSFER THIS RIGHT-OF-WAY BY ASSIGNMENT, GRANT OR OTHERWISE.

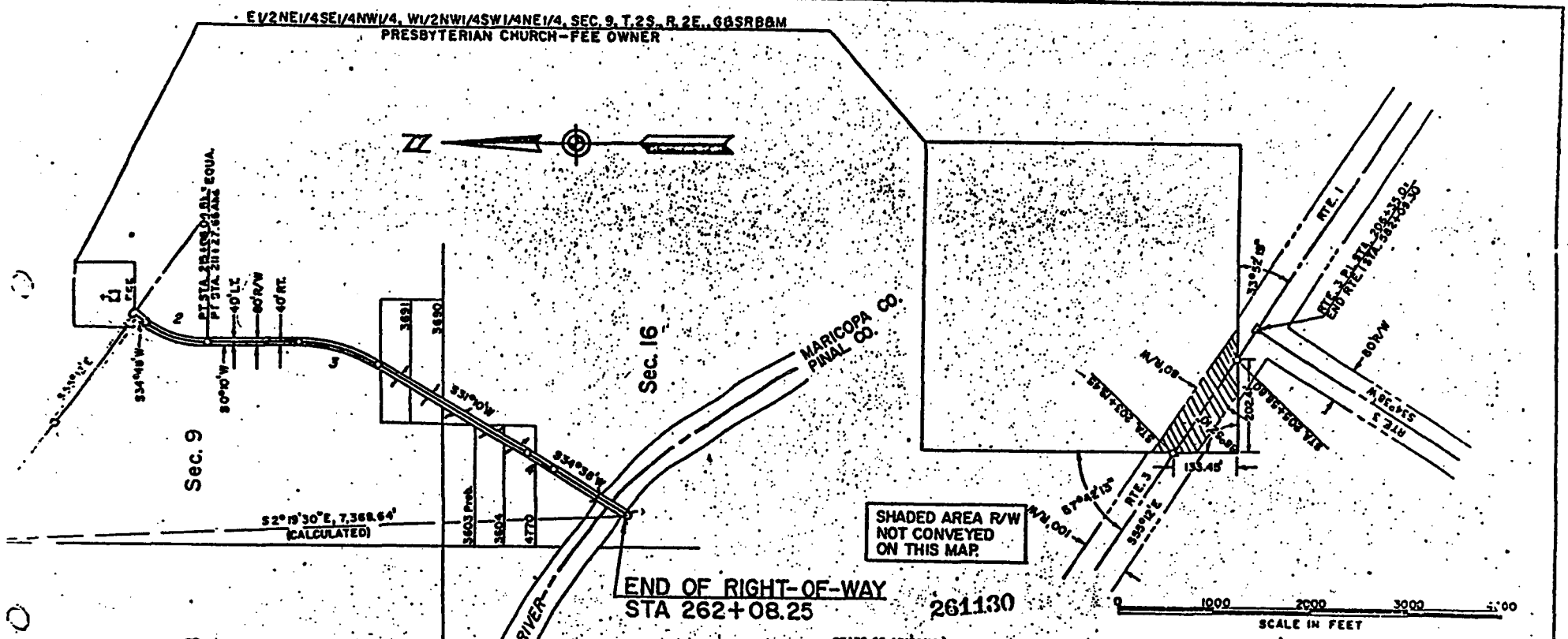
George S. Overby
GEORGE S. OVERBY, AREA ROAD ENGINEER
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
PHOENIX AREA OFFICE, PHOENIX, ARIZONA





CURVE NO.	Δ	D	T	L	PC	PT
1	55°10'L	1°30'	1,995.52'	3,677.77'	154+63.83	191+41.60
2	34°38'L	5°00'	357.39'	692.67'	208+13.37	215+06.04
3	31°00'R	3°30'	454.00'	885.71'	221+21.27	230+06.98
4	3°28'R	1°00'	173.39'	346.67'	249+06.55	252+53.22

NOTE: ALL LANDS ARE TRIBAL UNLESS OTHERWISE NOTED.



261130

STATE OF ARIZONA } ss
County of Maricopa }

I hereby certify that the within instrument was filed and recorded at request of MARICOPA CO. BD. OF SUPERVISORS

OCT 4 1972 -10 30

in Docket 9737

on page 814-816

Witness my hand and official seal the day and year aforesaid.

Paul N Marston
County Recorder

By Glyce Kitrell
Deputy Recorder

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
PHOENIX AREA OFFICE
ROADS

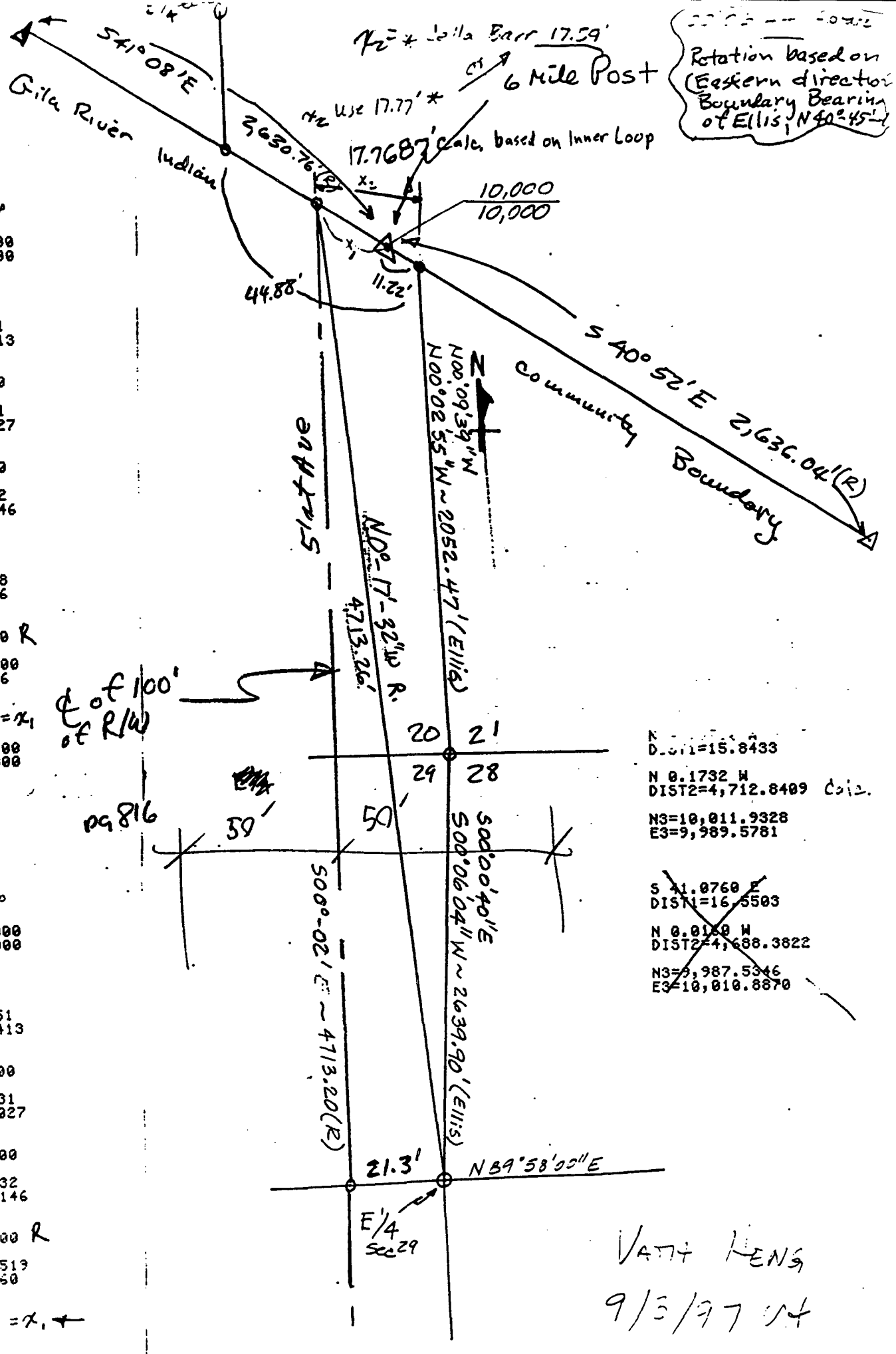
GILA RIVER INDIAN RESERVATION
RIGHT-OF-WAY MAP
ROUTE 3

MARICOPA COUNTY STATE OF ARIZONA

DRAWN J.D.K. RECOMMENDED
CHECKED R.B.H. APPROVED

...NOTED.

	PC	PT
	[illegible]+63.23	191+41.60
	[illegible]+13.37	215+06.04
	[illegible]+21.27	230+06.98
	[illegible]+06.55	252+53.22



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E1=10,000.0000

S 40.5200 E
HD=11.2200

N2=9,991.5151
E2=10,007.3413

S 0.0939 E
HD=2,052.4700

N3=7,939.0531
E3=10,013.1027

S 0.0040 E
HD=2,639.9000

N4=5,299.1532
E4=10,013.6146

S 89.5800 W
HD=21.3000

N5=5,299.1408
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N 0.0160 W
HD=4,713.2000 R

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Inner Loop

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HD=11.2200

N2=9,991.5151
E2=10,007.3413

S 0.0939 E
HD=2,052.4700

N3=7,939.0531
E3=10,013.1027

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HD=2,639.9000

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~~N 0.0160 W~~
~~DIST2=4,688.3822~~

~~N3=9,987.5346~~
~~E3=10,010.8870~~

VATT HENS
9/5/97 VH

RICOPA COUNTY BOARD OF SUPERVISORS
AGENDA FORM

Contract/Lease for ☐ NEW ☐ RENEWAL ☐ AMENDMENT ☐ CANCELLATION
LOW ORG. NO._____ DEPARTMENT: Transportation CONTROL NUMBER: TD 058-95
ENCUMBRANCE NO._____ AGENCY: Operations CONTROL NUMBER: PW 605

1. BRIEF DESCRIPTION OF PROPOSAL AND REQUESTED BOARD ACTION:

The Transportation Department Director recommends the approval of the Maricopa County Department of Transportation Truck Policy which will allow the Department to uniformly address truck prohibition requests and other truck policy issues.

The Transportation Advisory Board during their February 21, 1995, meeting recommended the approval of this policy.

All Supervisory Districts.

2. Compliance with Maricopa County Procurement Code

NA (article) N/A (paragraph) Renate Lewis (Procurement Officer)

SOLE SOURCE JUSTIFICATION:

3. CONTINUED FROM MEETING OF
DISCUSSED IN MEETING OF

4. ☐ THIS DEPARTMENT WILL CAUSE PUBLICATION
☐ CLERK OF THE BOARD TO CAUSE PUBLICATION

5. MOTION: It is moved that the Maricopa County Board of Supervisors: approve the Maricopa County Department of Transportation Truck Policy

6. FINANCIAL: ☐ Expenditure ☐ Revenue ☐ Budgeted ☐ Contingency ☐ Budgeted Amendment ☐ Transfer ☐ Grant or Other

N/A (TOTAL) Road (232) (FUND) S. Wilson (FINANCIAL OFFICER S. Wilson) 3.24.95 (DATE)

7. Operations/Contracts:

Renate Lewis, Contracts Manager DATE

8. DEPARTMENT: Transportation - 6400 TP:bs

Thomas R Buick (ACTION RECOMMENDED BY Tom Buick) 3/22/95 (DATE)

9. MATERIALS MANAGEMENT:

MATERIALS MGMT. DIR. DATE

B. W/MBE PROGRAMS DATE

10. LEGAL: Approved as to form and within the powers and authority granted under the laws of the state of Arizona to the Maricopa County Board of Supervisors.

Jerry Minter (DEPUTY COUNTY ATTORNEY J. Minter) 3/23/95 (DATE)

11. OTHER:

SIGNATURE DATE

12. APPROVED FOR AGENDA: Associate County Administrator, Operations

Larry A. Schmitt (APPROVING OFFICIAL L. Schmitt) 3-22-95 (DATE)

13. OTHER:

SIGNATURE DATE

15. RECOMMENDATION OF COUNTY MANAGER:

☒ Approved ☐ Disapproved

Comments:

D R Smith (COUNTY MANAGER) 4/7/95 (DATE)

14. BOARD OF SUPERVISORS: Action taken:
☒ Approved ☐ Amended ☐ Disapproved ☐ Deleted
Continued to:_____
(Date and type of meeting)

Fran McCarroll (CLERK OF THE BOARD) 4/19/95 (DATE)

AGENDA ITEM SUMMARY

Maricopa County Department of Transportation
Name of Project: Truck Traffic Policy
Work Order Number: Not Applicable
District No(s).: All Districts
Contact: Monica Beeman
Contact Phone: 506-8681
Date Typed: 3/15/95
Agenda Target Date: 4/19/95

ACTION

Approve the Maricopa County Department of Transportation Truck Traffic Policy.

ISSUES

The County frequently receives requests for truck prohibitions and other truck route issues throughout the unincorporated areas of Maricopa County. The Truck Traffic Policy was developed to uniformly address these requests. The Transportation Advisory Board reviewed the policy and recommended approval at their February 21, 1995 meeting.

OBJECTIVE

The goal of this policy is to uniformly and consistently review and evaluate requests for truck prohibition and other truck routing issues.

cll

THE MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

TRUCK TRAFFIC POLICY

Background

This policy was developed in response to various requests for truck prohibition and other truck routing issues in the unincorporated areas of Maricopa County.

Policy Statement

Trucks are permitted on County roads. The term truck shall be defined as any vehicle used primarily for commercial purposes with a gross vehicle weight over 10,000 pounds. Permanent, mandatory truck routes will not be established. Local truck traffic will generally be permitted. "Through" truck traffic may be prohibited. Requests to prohibit "through" trucks on County roads will be evaluated based on the category of the road, as defined in the County Roadway Design Manual, and other considerations, as indicated below.

- If the road is an arterial, through trucks will generally be permitted.
- If the road is a collector street, through trucks may be prohibited after review of factors, including, but not limited to:
  - the availability of reasonable alternate routes
  - the necessity of access to land use
  - the shortest direct route to destination
  - coordination of truck routing with adjacent jurisdictions
  - the percentage of heavy, through trucks that exceed 5% of Average Daily Traffic (ADT)
  - road geometry or design
  - traffic congestion below Level-of-Service "C"
  - unusual traffic operational hazards
- If the road is a local street, through trucks may be prohibited after review of factors, including, but not limited to:
  - the availability of reasonable alternate routes
  - the necessity of access to land use
  - the shortest direct route to destinations
  - unusual traffic operational hazards

The evaluation will determine whether prohibition of through trucks is warranted. If warranted, a Board of Supervisor' resolution is required to enact the prohibition. Authorization for this type of resolution is given to the Board of Supervisors in Arizona Revised Statutes § 28-643 "Local traffic-control devices."

THE MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION

TRUCK TRAFFIC PROCEDURE

Steps

1) Upon receipt of a request to prohibit trucks on a particular roadway, the Traffic Engineering Division will initiate a study to evaluate the request.

2) The evaluation will be based upon the category of road and other considerations as outlined in the MCDOT Truck Traffic Policy.

3) If the study indicates that through trucks should be prohibited, the Traffic Engineering Division will prepare a Board of Supervisors' agenda item to approve a resolution prohibiting through trucks. Example agenda item is attached.

4) The resolution should identify the specific section or sections of one or more roads where the prohibition will apply.

5) The Traffic Engineering Division will install "No Through Trucks" text signs at appropriate locations in conformance with the Manual of Uniform Traffic Control Devices and the MCDOT Sign Manual.

6) The Maricopa County Sheriff's Office will enforce the prohibition upon request by citizens or County officials.

51ST AVENUE ENVIRONMENTAL OVERVIEW

Broadway Road - Pecos Road
Project Nos. 68913 & 68943

ENVIRONMENTAL OVERVIEW

The purpose of this environmental overview is to evaluate and describe the existing environment along the existing 51st Avenue Road corridor based on available data and to identify the potential environmental concerns within the corridor area. This environmental overview will evaluate the proposed upgrade of 51st Avenue from a two-lane arterial roadway to a 5 lane roadway from Baseline road to Broadway road and from Baseline to Pecos road a 3 to 5 lane roadway. The overview is not intended to meet requirements of the National Environmental Policy Act (NEPA) for the proposed project. An appropriate environmental document will be prepared during a later phase of the project, as needed to obtain project approval.

This overview describes the project area in terms of physical, natural and cultural environment within the context of its socio-economic development. The information provided is based on existing data from various municipal, county, federal agencies and a windshield survey of the project area. For this overview, the project area is generally defined as 51st Avenue from Pecos Road as the southern termini point on the Gila River Indian Community (GRIC) and Broadway Road at the northern end of the alignment.

PHYSICAL/NATURAL ENVIRONMENT

Water Quality

The proposed roadway project will not affect ground water quality, except for the potential for accidental spills of hazardous materials. The depth to ground water is generally less than 950 feet below ground surface in the two mile reach from the Salt River to Baseline Road. It is in this segment that ground water contamination due to accidental spills would have the most potential, but the proposed alignment would have no influence on the potential. Ground water south of Baseline heading toward South Mountain exceeds 1,050 feet.

Ground water contaminants in the area are primarily from nitrates, metals, and sulfates. This form of contamination is typical of agricultural areas where applications of herbicides and pesticides have leached concentrations of nitrates and sulfates into groundwater.

Drainage/ Topography

In general, the project area is relatively flat, gently sloping in a northwesterly direction toward

the Gila and Salt Rivers. Elevation ranges from 1150 feet above mean sea level on gently sloping land adjacent to South Mountain to 1000 feet above mean sea level in the Salt River channel.

The study area is situated within a broad drainage basin of approximately 26 square miles and drains from the east and southeast toward Baseline Road. The basin headwaters originate in the western part of South Mountain and flow in a northwestern direction in a sheet flow pattern toward Baseline Road. The Champion Drain is an existing irrigation waste water ditch located in the natural low point that parallels the northern portion of Baseline Road. The Champion Drain will be utilized to convey to the west the surrounding flow in the vicinity of Baseline Road from the proposed 51st Avenue project.

The drainage pattern north of Baseline Road has been substantially altered by farming practices and the roadway irrigation facilities. The impact of 51st Avenue is somewhat attenuated by the location of the roadway in that the drainage flows essentially follow along the natural roadway path.

A drainage basin at Estrella Drive and Elliot Road would collect water from much of the western South Mountain area. Currently the flow pattern is to the west in the irrigation return ditches, on the existing roadway, and as sheet flow. The 51st Avenue widening will cause this flow to continue to concentrate at Elliot Road and Estrella Drive.

Several features in the drainage basin will need to be evaluated to address overall drainage issues as well as problems created during construction. Consideration should be given to reduce flood flows to manageable levels. Coordination with ADOT and Maricopa County Flood Control will be necessary to account for drainage impacts from the proposed ADOT South Mountain Freeway. The incorporation of retention basins at Estrella Drive and Elliot Drive would reduce the size of downstream channels and structures.

Water Wells

Water resources in the 51st Avenue Study consist of surface water delivered by the Salt River Project Grand Canal north of the Salt River and by other SRP canals south of the river, and Ground water pumped from numerous wells. Ground water in this area is found in the deep alluvial deposits of the west Salt River Valley.

Based on preliminary data several water wells (see Appendix A - Features) were identified in the area of potential effect from the proposed project. Should wells be identified in the project area the principal impacts of the roadway upon the well supplies would be: (1) need for removal of wells from the right-of-way and (2) possible severance of a well from areas requiring water.

Mitigation efforts for well closure or relocation would be necessary during the design phase for this project.

Water Quality Permits

It is anticipated that an Aquifer Protection Permit (APP) will not be required for the proposed roadway construction. Because the project disturbs more than five acres a National Pollution Discharge Elimination System (NPDES) permit will be required.

Clean Water Act - Section 401 and 404 Permits

The U.S. Army Corps of Engineers and the Arizona Department of Environmental Quality will be contacted early in the planning or the proposed projects. The placement of fill in waterways is regulated under Section 404 of the Clean Water Act by the U.S. Army Corps of Engineers. This agency's regulatory branch should be contacted to determine the need for a nationwide or individual permit. ADEQ should be contacted to insure that proposed projects comply with the state water quality standards and Section 401 of Clean Water Act.

A 401 certification letter from Arizona Department Environmental Quality will be required for the upgrade and/or construction of the bridge on 51st Avenue across the Salt River and the likelihood of bridge activities falling under the revised nationwide 404 permits is indeed likely. Should the 51st Avenue Bridge project fall under an individual Nationwide Permit, time allowances necessary to process the permit should be taken into account.

Air Quality

The entire study area from Broadway Road to Pecos Road on 51st Avenue lies within the Maricopa County Non-Attainment Area. This air basin is an area in which one or more criteria pollutants exceed the National Ambient Air Quality Standards (NAAQS). The pollutants that exceed the prescribed air quality standards in the non-attainment area are particulate matter (PM-10), carbon monoxide (CO), and ozone (O_3) identified by the Arizona Department of Environmental Quality, Air Quality Division.

Primary sources of PM-10 within Maricopa County are from vehicle exhaust and road dust. Agricultural activities, the mining activities of gravel companies in the Salt River bottom, and the dust from dirt roads contribute to the levels of PM-10 within the study area.

Noise

According to Federal Highways Act procedures, noise abatement must be considered when implementation of a roadway project results in a substantial increase over the existing noise level or otherwise exceeds established criteria (A substantial increase is usually defined as 15 decibels

greater than the existing noise level).

FHWA Noise Abatement criteria are shown in Table 1 below.

TABLE 1
FHWA NOISE ABATEMENT CRITERIA

Activity Category	Description	Leq (h)
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve it's intended purpose.	57dBA
B	Residences, schools, parks, churches, libraries, hospitals, motels, and hotels,	67dBA
C	Developed lands not included in Categories A or B	72 dBA

Source. - Code of Federal Regulations, Title 23, Part 772

There are two noise category types found within the study area. Category B includes residential type land uses such as single family homes and churches, and Category C is associated with land uses such as commercial and light industrial. Potential noise impacts for the selected corridor will need to be evaluated in terms of Federal Regulations for Noise Abatement.

If additional lanes are added to increase traffic in the area of Dobbins and 51st Avenue in the area of residential homes, this would likely constitute a substantial increase in noise levels in the area potentially approaching criteria levels. MCDOT will conduct a noise study as part of the environmental evaluation; however, no federal funds are expected to be used for project construction.

Visual

The visual character of the project area is dominated by South Mountain to the southeast, the Estrella Mountain to the west, and agricultural lands south of the Salt River. South of Dobbins the residential area with its predominant over story of non-native trees contrasts sharply with the grey-green hues of native desert scrub and the dark earth tones of the south mountain area. Views tend to be expansive stretching to the horizon except when viewing the South Mountain and Estrella Mountains on the southern portion of the study area.

Vegetation and Wildlife

Since the majority of the land use is cleared for agricultural purposes, the small amount of native habitat is described as typical of the Desert scrub zone supporting numerous smaller mammals, birds, and reptiles. The wildlife habitat and populations vary widely along the project area due to the variation from a riparian habitat along the Salt River on the north end, to the agricultural areas to natural desert toward the southern portion of the study area. Common species occurring in the project area include the Black-tailed Jack Rabbit (*Lepus californicus*), Coyote *(Canis latrans)*, Round-tailed squirrel (*Spermophilus teretcaudu*), Pocket mouse (*Perognathus hemionus*) crooki, Dove *(Scardafella inco)*, Gambels Quail (*Lophortyx gambeli*), Catus Wren *(Camphylorhynchus brunneicapillus*), Harris Hawk (*Parabuteo unicinctus)*, Western Diamondback Rattlesnake (*Crotalus atrox*), desert tortoise (*Gopherus agassizii*) and Desert Horned Lizard (*Phrynosoma platyhinos calidiarum*). The Arizona Game and Fish Department and U.S. Fish and Wildlife Service will be consulted regarding protected plant and animal species.

The study area in the South Mountain area presents a unique situation with an abundance of wildlife largely resulting from available water from irrigated farmlands and its proximity to the Estrella Mountains to the west.

The South Mountain Park area is inhabited by a large number of animals indigenous to mountainous areas. These animals are know to travel between the Park and Estrella Mountains. Animals known to inhabit the area include deer, ringtail cats, javelina, and mountain lions. Bighorn sheep used to be found in the area, but are now inhabitants of the Estrella Mountains.

Cultural/Historic

A Class I archaeological resources inventory for 51st Avenue was conducted along the corridor. The research identified 51 archaeological sites and four prehistoric canal segments within the eight-mile stretch of road.

Archaeological resources within the project area, identified by the Pueblo Grande Museum, are limited to Hohokam Indian Villages. Three large village sites have been identified within the Laveen Planning Area (ref. Laveen - Land Use Plan Maricopa County) are as follows: 1) Pueblo Primero; 2) Las Cremaciones; and 3) Villa Buena. Smaller sites would be expected to extend beyond the large village sites.

A archaeological consultant will conduct a pedestrian survey of the right-of-way alignment in the July or August time frame to determine the potential impact to historical sites. Based on the Class III survey further investigative evaluations may be necessary.

Hazardous Materials

Hazardous materials are regulated by the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Information was reviewed to locate areas of environmental concern. There are no Superfund or State Water Quality Assurance Revolving Fund sites identified in the project area. There were no operational landfills located within or near the project area.

Underground storage tanks were identified in the project area. The convenience store at Pecos Road and 51st Avenue, the Laveen School operation and maintenance facility, the general store at the southeast corner of Dobbins Road and 51st Avenue, a general store at 51st Avenue north of Baseline Road and a storage tank on the northwest corner of Dobbins and 51st Avenue.

Leaking Underground Storage Tanks

Noted leaking underground storage tanks (LUST) sites are identified as: 1) 1/4 mile north of Baseline Road at convenience store, and 2) Laveen School District Maintenance Facility south of Dobbins Road on 51st Avenue.

Past agricultural chemical practices in the use of pesticides and herbicides throughout the rural community involved chemicals that were very stable and therefore did not break down readily. Though chemical application of these chemicals has been discontinued since the 70's, concern from residual chemicals especially along newly acquired right-of-way in existing agricultural farming areas potentially still exists. With proper dust control measures in place soil testing would not be recommended.

Socio-economic Environment

The Socio-economic environment description consists of social economic elements of the project area, including property ownership, land use, zoning, Socio-economics, and publicly owned lands.

Jurisdictional Boundaries/Land Use

The project area primarily consists of lands within the City of Phoenix jurisdictional area and within the Gila River Indian Community. Land outside the Gila River Indian Community is predominantly privately held in agricultural and rural developed parcels. The US Army Corps of Engineers has jurisdiction within the 100 year floodplain of the Salt River area. An area near the southwest section of the bridge over the Salt River is owned by the Arizona State Land Department.

Land uses within the project area generally consist of agriculture, commercial, residential, open

space and tribal use. Commercial and retail uses are generally located at the intersections of major arterial roadways and 51st Avenue. The Laveen School districts administrative office and school property is located at Dobbins and 51st Avenue. Industrial land tends to be located toward the northern project areas around the Salt River area. Residential areas were noted in areas between Dobbins Road and Elliot Road. A few residential properties on GRIC land were noted along 51st Avenue.

Publicly Owned Lands

Under the potential that federal funding might be used to construct projects, Section 4(f) of the Department of Transportation restricts the used of any publicly-owned land in a park, recreation area, wildlife or waterfowl refuge, or land from historical sites for highway purposes. This act requires consultation with various resource agencies, and documentation that there are no feasible and prudent alternatives to the use of such land, and a determination that the proposed actions includes all possible planning to minimize harm to such lands before Federal funds can be used for highway purposes on these lands.

There is no wildlife or waterfowl refuges designated within the project area. There is no park and recreational land use areas located within the project area. The potential for historic properties is under the historical context of the general store on the corner of Dobbins and 51st Avenue. The potential that the property is of historic significance is not likely and therefore 4(f) properties are not likely to be impacted.

Environmental Justice - Title V/EO 12898

Environmental Justice provisions stipulate that actions do not exclude persons and populations from participation, deny persons and populations of the benefits of the proposed action, activities or subject persons and populations of the benefits of the proposed action or subject the same to discrimination because of race, color, or national origin.

Within the project area, the majority of the population of the GRIC is largely American Indian. The Community members are within designated protected populations. A portion of the proposed 51st Avenue project is located within the Community. The project will actually enhance the transportation configuration and safety within the GRIC land. The GRIC is building a casino near the project area southeast of the 51st Avenue and Dusty Lane intersection. Traffic volume projections indicate increased traffic volume in the area due to casino activity. The proposed project will not adversely affect or disproportionately impacted the minority community.

Agriculture, Prime, and Unique Farmlands

The study area is located in Maricopa County, long known for its agricultural use. The combination of suitable soils, water supply, and a long growing season have made possible the development of highly specialized, intensive farming in the study area. In Maricopa County field crops include cotton, wheat, turf, corn, irrigated pasture, barley, pistachio, and soybeans. Vegetable crops include lettuce, tomatoes, cantaloupes, onions, watermelons, cauliflower, broccoli, carrots, peppers, cabbage, squash, brussel sprouts, and string beans. Much of the agricultural production in Maricopa County is devoted to citrus trees, predominantly oranges and lemons. The dairy and feedlot industry plays an important role in the county.

The designation of prime farmland grew out of a program by the Natural Resource Conservation Service (formally the Soil Conservation Service) to map the Nation's important farmlands. The continuing conversion of agricultural lands led to the passage of the Farmland Protection Act (Public Law 97-98) in 1981 which was amended in 1994. The act expressed the need to recognize the effect of their actions and programs on the Nation's farmlands.

Under the Farmland Protection Act, the USDA was charged with implementing a program to develop criteria for identifying the effects of Federal programs on the conversion of farmlands to nonagricultural uses. These criteria were published in 1983. A minimum amount of right-of-way will be acquired for the roadway improvement project. The overall impact on farms would be considered minimal.

APPENDIX A

FEATURES ALONG 51ST AVENUE

Building	General Store -SE corner Dobbins Road and 51st Ave Post office, Laveen Laveen Elementary School (51st Avenue south of Dobbins) Laveen Baptist Church (51st Avenue and Dobbins) St. John's Indian School (51st Avenue and Pecos Road) Anderson Clayton Gin (Southern and 51st) Laveen Feed & Tack Convenience Store (Pecos and 51st) Residences at Larson Road and 51st Avenue
Gravel Operations	Ajax Sand & Gravel (SWC along Salt River) Calmat (SEC along Salt River)
Bridge	Salt River Bridge (51st Ave. & Broadway)
Parks	South Mountain Park and GRIC Ball Diamonds
Canals	Western Canal crossing north of Dusty Lane and 51st Avenue Irrigation Canals (west side of 51st from Southern to Dobbins)
Drainage Ditch	Champion Drain at 51st Avenue and Baseline Road
Underground Storage	Laveen School Districts Operation and Maintenance Facility, Laveen Feed and Tack, Laveen General Store, Convenience Store at Pecos Road and 51st Avenue.
Utilities	SRP, DOE, APS, Sante Fe, Southwest Gas, Gila Water Company, Phoenix Water and Sewer, and El Paso Natural Gas
Developments	Dobbins to Estrella
Water Wells	SWC (Southwest Corner) of Southern and 51st Avenue NWC Baseline & 51st NWC Estrella & 51st
Gila River Indian Community Boundary	51st Avenue & Dusty Lane

<u>NATURAL FEATURES</u>

Salt River	51st Avenue south of Broadway
South Mountain Foothills	Ray Road to Elliot Road

SUPPLEMENT TO 51st AVENUE OVERVIEW

As part of MCDOT's assessment of the 51st Avenue Overview Study, the Environmental Planning Section is continuing to evaluate environmental issues identified within the overview report. Based on information reviewed, MCDOT will produce an Environmental Assessment for the current project area from Broadway Road to the Gila River Indian Community (GRIC) along 51st Avenue. This document will assess the impacts to the environment.

The road improvements along 51st Avenue will be conducted in phases with the first phase extending from the GRIC Boundary to Baseline Road. Additional phases includes the addition of a new bridge and/or improvement of the existing bridge at 51st Avenue, and the upgrade of the two lane roadway between Baseline Road and Broadway Road.

WATER QUALITY - Section 404 & 401 PERMITS

As an element of the Environmental Assessment MCDOT is in the process of obtaining a Section 404 Permit from the Army Corps of Engineers for bridge construction in the Salt River. Due to the extent of activity and amount of disturbance, an Individual Permit will be required for this project which includes alternatives to the proposed action. MCDOT will be required to obtain Section 401 Water Quality Certification from the Arizona Department of Environmental Quality (ADEQ) for water quality purposes.

If it is determined that in order to construct or improve the 51st Avenue Bridge the water needs to be drained from the area beneath the bridge, a de-watering permit will be required from the Arizona Department of Water Quality (ADWR). In addition, the removal or construction of water wells will require an Aquifer Protection Permit (APP).

In conjunction with the Section 404 Permit, a Biological Assessment (BA) will be conducted due to the fact that the bridge project will impact wetlands. A BA will provide the information needed by MCDOT to determine if the project will, in any significant way, adversely affect endangered species, which would require MCDOT to enter into formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to Section 10 of the Endangered Species Act.

CULTURAL

The Cultural Element is presently being addressed with a Class III cultural survey having been conducted in June 1997. Based on the initial information and findings of extensive Hohokam settlements in the area further studies are likely warranted. Based on the 51st Avenue Cultural Resources Report, MCDOT will proceed with further investigations in areas that are agreed upon by MCDOT's Archaeologist and MCDOT's consultant, with concurrence by the Arizona State Historic Preservation Office. At a minimum this investigation involves subsurface investigations in agreed upon areas within MCDOT's right-of-way.

NOISE

Should circumstances warrant it additional noise studies/modeling may be required in order to assess the advisability of noise barriers along portions of 51st Avenue.

ENVIRONMENTAL ISSUES

Project Name -51st Avenue

Work Order #s 68913 & 68943 Date - May 5, 1997

Southern Termini = Pecos Road Northern Termini = Broadway Road

Site Visit : Yes

	Yes	No	Study
Archaeology			X
Ecology -Aquatic			X
Ecology- Terrestrial			X
T&E Species - Fed.			X
T&E Species - State			X
Native Protected Plants	X		
Wildlife			X
Riparian			X
Wetlands			X
Floodplains	X		
Hazardous Waste Sites		X	
Prime/Statewide Farmland		X	
Section 4(f), 6(f)		X	
Social		X	
Sole Source Aquifer		X	
Air		X	
Land Use		X	
ROW Required	X		
Noise			X
Visual		X	
Economic		X	
Other	X		

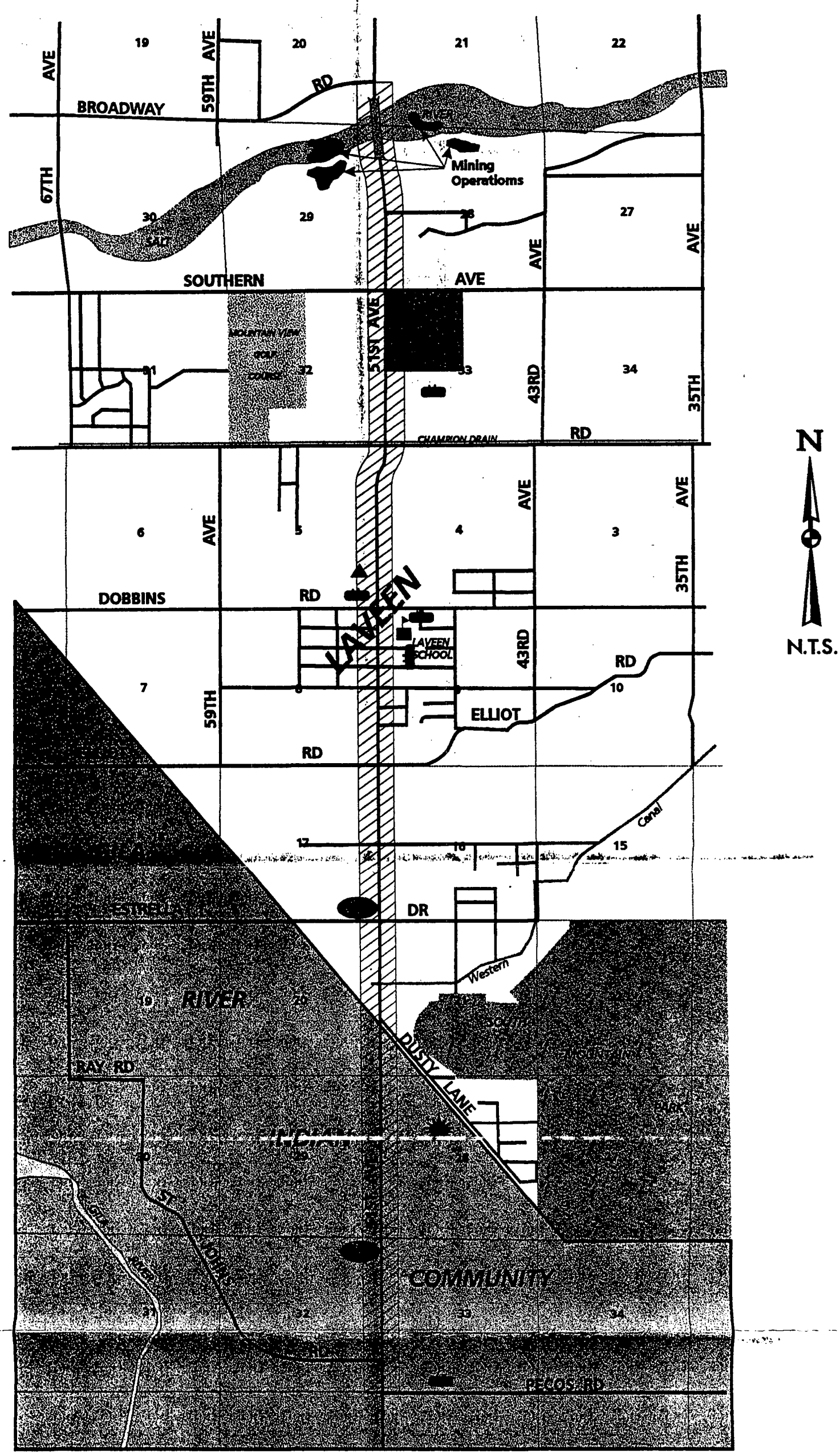
Other included drainage, safety, and traffic study

ENVIRONMENTAL CLEARANCES REQUIRED

	Yes	No
ADEQ Water Quality Certification	X	
Corps - Section 404 Individual	X	
Corps - Section 404 Nationwide		
Section 7 or 10 Consultation		X
NPDES-Nat. Pol. Disc. Elim. Sys.	X	
Tribal Communities	X	
State Historic Preservation Office	X	
Flood Control District	X	
Fed. Land Management Agencies	X	
Other:_____		

COMMENTS: (significant impacts, unique features, special problems, sensitive issues)

As a result of proposed project being located within the Salt River channel, a Section 404 Permit will be reviewed by a number of agencies, including Az. Game and FIsh Department, U.S. Fish and Wildlife Service and Az. Department of Environmental Quality Certification under Section 401 of the Clean Water Act. The Section 404 permit from the Army Corps of Engineers will take a considerable period of time to procure. It is not unreasonable to expect lead time to obtain an individual permit from 9 months to 1year. Should a Section 404 Nationwide Permit be issued under an existing statue would require 6-9 months. The Corps may possible require an Environmental Assessment (EA)

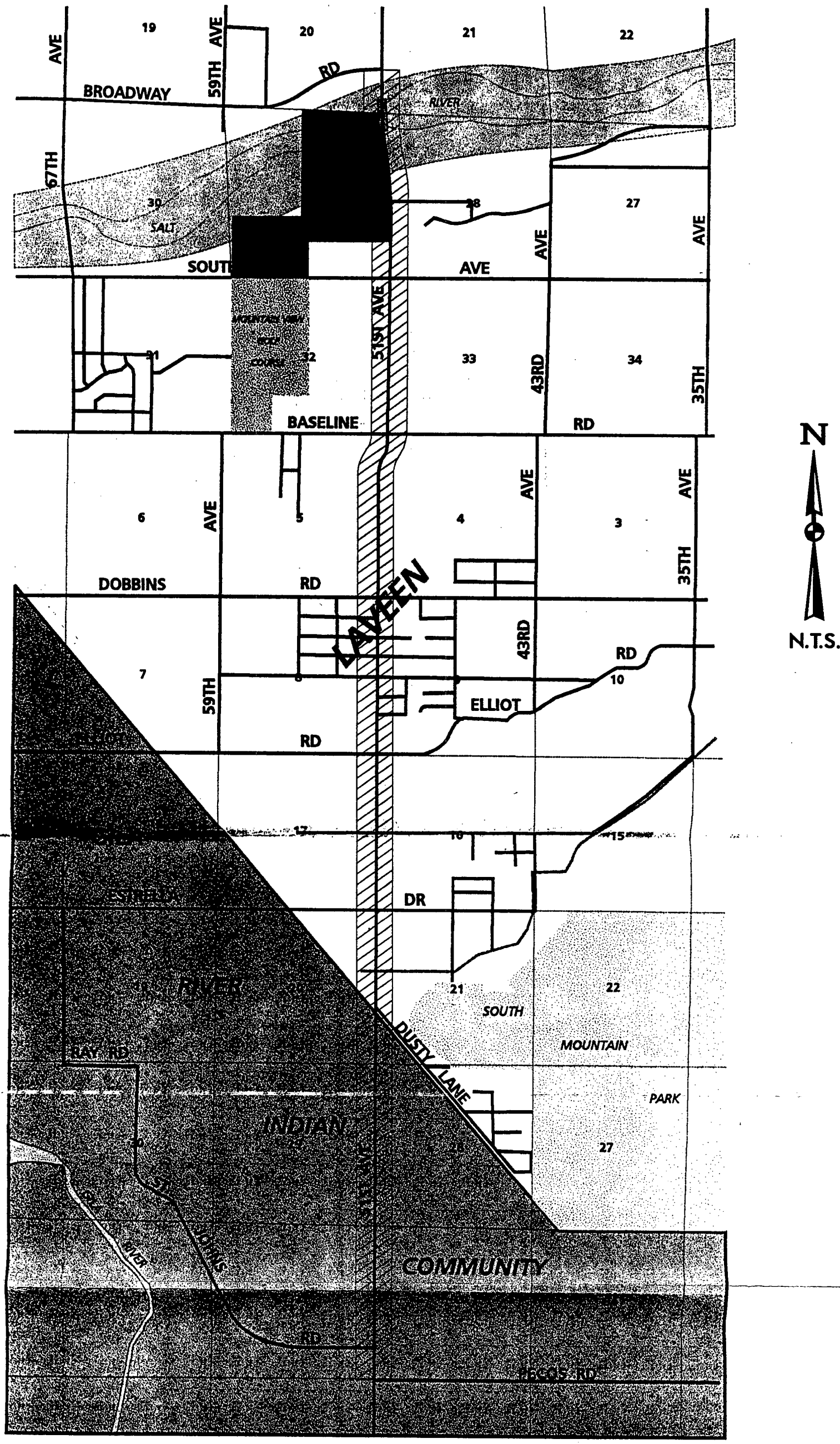


LEGEND

- Salt River 51st Ave Bridge
- A6 Land
- Proposed Casino
- Underground Storage Tank
- Water Well
- Fire Station
- Project corridors

51st Avenue Overview
LAND USE
Project #68913 & #68943

5/20/97



LEGEND

- COE (Corp of Engineers)
- State Land
- Maricopa County
- Gila River Indian Community
- City of Phoenix
- PROJECT CORRIDORS

LAND OWNERSHIP PHYSICAL/NATURAL JURISDICTIONAL AREA

5/20/97

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St. Johns Road
51st Avenue
Proposed Realignment of St. Johns Road
Pecos Road