THE PREDICTED EFFECT OF THE INTERSTATE BY-PASS ON ELOY, ARIZONA

by

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STATEMENT BY AUTHOR

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Chapter 1

INTRODUCTION

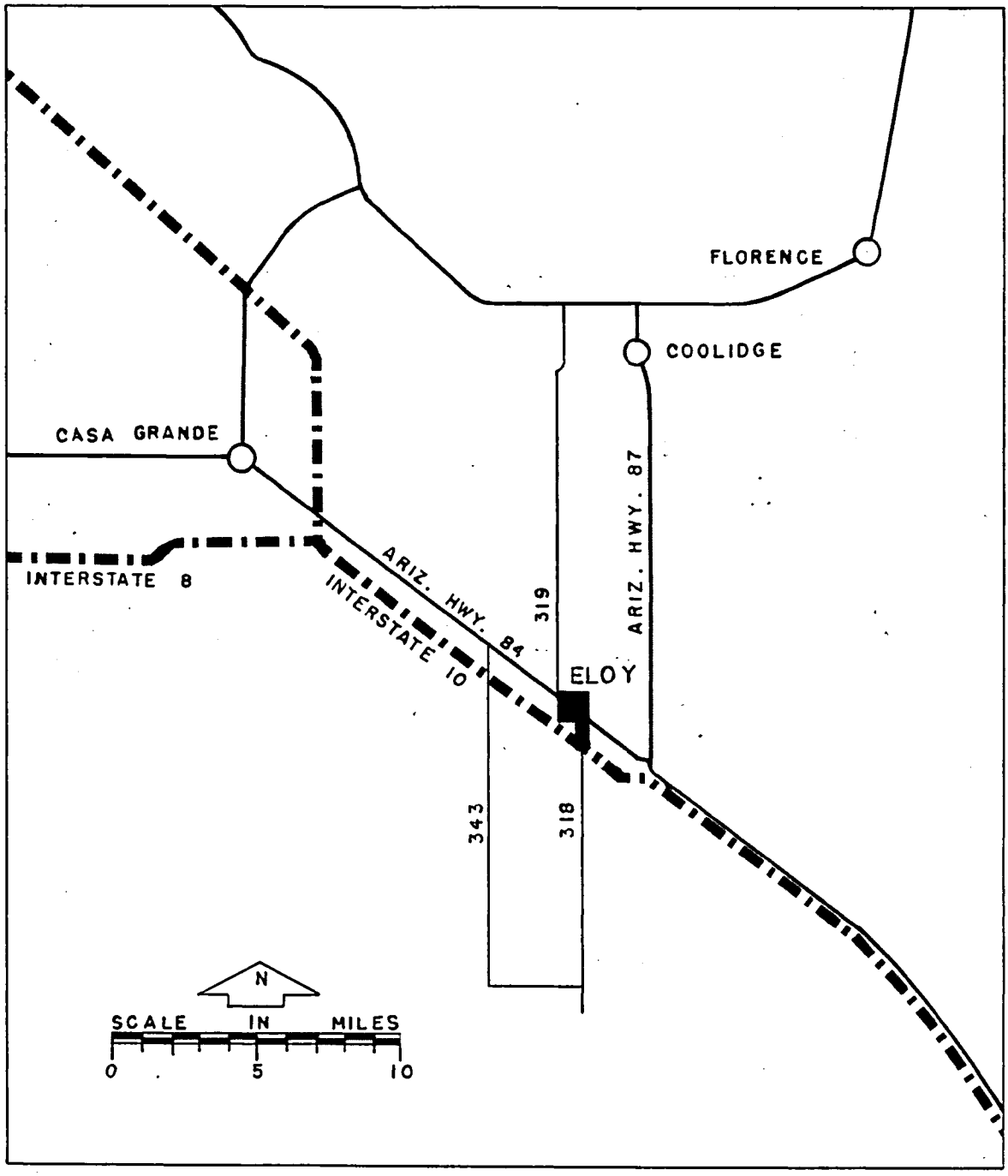
1.1 General Discussion

The city of Eloy, Arizona will, in late 1965, be added to the already large number of communities, throughout the country, which have been by-passed through re-routing of major highways. The absence of through traffic will alter the characteristics of land use, property values, retail sales and traffic flow which exist prior to construction of the by-pass.

Eloy is a small incorporated city of 4,899 population (1) located just north of proposed Interstate Route 10, midway between the major population centers of Phoenix and Tucson (see Figure 1.1). Interstate Route 10, when constructed, will parallel the present alignment of Arizona 84 and route through traffic approximately one mile south of the business district.

Through travelers will have little cause to penetrate the business district since required services will undoubtedly be more easily obtained along the Interstate corridor and will, therefore, not be a factor in local street traffic flow. Conversely, local traffic will have relatively weak desires for movement to any part of the city on the by-pass route. (2)

Eloy exists as an agricultural trading center and serves as a collecting point for cotton and miscellaneous farm products enroute to market. It is also a distribution point for goods and services rendered to its agriculturally-oriented residents. Technological advancements in farming techniques have materially reduced the relative size of the



ELOY BY-PASS

FIGURE 1.1

labor force and effectively slowed the rate of growth of both population and retail sales. (3, 4) Economic indicators, such as retail sales, reveal that Eloy is neither maintaining pace with the growth rates of the dominant communities in Pinal County nor with the balance of the state.

Growth statistics for Eloy may tend to cloud the picture unless it is realized that appearances of stagnation may be partially explained. At one time more than 11,000 migratory workers descended on the community each year during cotton season and contributed to the economic base. The loss of this activity has forced the city to enter into a transitory or recovery phase of its development. Eloy's declining position as a trading center is indicative of this transition. (4)

The relocation of the highway will add some complications in terms of reduced municipal revenues but the elimination of through traffic should materially benefit the city. (5)

Police court fines constitute a major source of non-utility revenues collected by Eloy and a significant portion of the total court fines is derived from through traffic. (6) Higher legal speed limits and lack of jurisdiction over I-10 traffic (Figure 1.1) will reduce the through traffic violations in Eloy and materially affect municipal revenues.

1.2 Purpose and Scope

Unlike most studies of by-passed communities, which enjoy general economic growth, this study centered on the community of Eloy, Arizona; which, economically, is backsliding. (4) Although Eloy is growing in population, its retail and real estate activities are not directly reflecting this growth. (7) In this by-pass study such factors as land use and value, population and socio-economic distribution,

retail sales, traffic volumes and parking supply and demand were used to determine the probable effect the presence of the by-pass will have on the community. Other reports have resorted to "after" studies to determine over-all effects. Since the Eloy by-pass has not yet been constructed, the over-all effects were predicted from analyses of data from other by-pass studies and the resulting conclusions were applied to the problem encountered in Eloy. (6)

Unfortunately, little of the specific data, on which published conclusions were based, are available from the many "before and after" studies which have been conducted. This obstacle, together with the impossibility of obtaining detailed sales tax reports from the Arizona Tax Commission for individual communities was a severe limitation encountered in the course of this study.

The design year, 1980, was selected for making projections of the variables in this study. It was not expected that the projections would prove completely accurate for the design year but that the forecasts would approximate 1980 statistics and be realized either before or after 1980. A 20-year forecast allows for reasonable expectation of success in projections where forecasts over longer periods are less accurate because of the difficulty of adequately predicting effects of technological change on employment, population distribution and general economic activity.

Chapter 2

PREVIOUS INVESTIGATIONS

2.1 Approach to Problem

Considerable interest in the effects of a by-pass route around a community has resulted in many economic studies in different sections of the country. Generally these studies are of a "Before" and "After" type and involve comparisons of retail business, land use, land value, and traffic volumes for periods preceding and following the opening of a high-type by-pass facility. California has been a leader in this type of investigative endeavor since their extensive freeway system was in the process of development before the advent of the Interstate Highway Act. (8)

Studies of the effects of both limited and non-limited access by-passes have clearly defined the advantages of limited access. (9) A non-limited access by-pass quickly suffers a loss of travel time because of the rapid build-up of commercial frontage. In effect, such a by-pass becomes another city street which requires a new by-pass since the cost of acquiring abutting properties for widening or for restricting access makes the cost of improvement prohibitive. It was determined in the Dallas, Houston, and San Antonio studies (10), and substantiated by California studies, that land values adjacent to the by-pass increase by as much as 500 percent. (11) Two California studies of agricultural communities reported considerable overall improvement in retail sales in one and no appreciable effects in the other (12, 13) Service stations and cafes, located in Fairfield, California, which received large highway patronage, suffered a 24 percent drop in sales while significant increases of 46 percent were realized by stores catering to local busi-

ness. Property values increased proportionately to reflect the increased sales activity.

Traffic volumes along major arterials, paralleling a by-pass, have been found to decrease from 10 to 60 percent when the by-pass is opened to traffic. (2, 14) The extent of changes in traffic volumes resulting from the development of a by-pass is a function of the percentage of total trips which are through trips and have no reason for passing directly through a community. It follows that if a majority of trips approaching the city core have destinations in the core, little change in traffic volumes on city streets may be expected. (14) In many cities the reductions in traffic volume have been only temporary since normal growth, coupled with increased business activity due to reduced traffic friction, has ultimately compensated for the losses. (2) Careful planning of both access and alignment of by-passes greatly affects the volume of local traffic diverted to the by-pass. A facility can be designed to be either attractive or unattractive to intraurban traffic by the selection of interchange locations. (15, 16)

Previous studies indicate that business oriented to the local trade area will generally recover from the small losses resulting from partial elimination of through traffic. (17) Because the percentage of through traffic which normally stops in a community is usually quite small, the increment of economic base derived from this source is small. (18) Losses resulting from a by-pass are generally limited to types of business which cater to through-traffic needs; these include service stations, cafes, and motels. (12) Losses are usually recovered and increased locally-oriented activity for all types of business may be expected in one to two years. (5) There are factors such as location, type, and ownership of business, which may prevent a recovery from losses suffered as a result of a by-pass. (19)

Since the economic base is different for each community only generalized conclusions may be drawn from economic studies. Consideration must be given to population trends, types of industry, size of trading area, location and accessability of other trading areas, and to the prevailing community spirit. (20) A negative value for any one of these factors will tend to nullify any benefits normally resulting from a by-pass route.

Several sources of land value data have been utilized by various research groups. In a Colorado study (21) by Bardwell and Merry, land values were determined from the sale price based on tax stamps. Some land value studies specifically mention including the value of mortgages assumed. Others exclude all sales where mortgages are involved and the tax is paid only on the equity. (22) California studies generally stress that all sales should be verified with the buyer and seller to learn if any extenuating circumstances influenced the sale. (23) Other studies have only considered vacant land sales. (24)

The sources of retail sales data seem to be as varied as those for property sales. Many states, by law (20), will not reveal specific sales tax collections from a community. This limitation has severely handicapped researchers. In some areas, interviews with effected businessmen have been used, although it has been concluded that reliable factual data were not obtained. (25)

Case studies of land value control sections are favored by some investigators, while in instances where appropriate control areas could not be found, multiple regression analyses of the variables involved in the worth of real estate have been used. Holshouser (26) states that, "Much research will be required before any numerical representation (of the highway effect variable) can be used with confidence! "

It is apparent that some serious limitations have been imposed on previous studies and some authorities feel that, because of these limitations, studies have been restricted to roads whose impact was clearly significant, thus negating comparative analysis. (27)

Chapter 3

DESIGN OF EXPERIMENT AND PROCEDURES

3.1 Design of Experiment

The design of an experiment identifies the variables and establishes the types of data to be collected. In this experiment the dependent variables for which data were collected were:

1. Land Use
2. Land Value
3. Population
4. Retail Sales
5. Parking
6. Traffic Volumes

These variables were not considered as being the only dependent variables which would be influenced by the by-pass. However, they were selected for two reasons: (1) availability of data, and (2) the possibility of comparison with other studies. In effect, the design of this experiment was dictated by the lack of adequate data for other variables needed to provide a statisticial base for purposes of analysis. Therefore, the trend for each variable was analyzed and projected to the design year to determine the effects of the by-pass.

3.2 Procedures Utilized

Field observation and recording the use for each tract of land was necessary to obtain an up-to-date land use base. A simplified land use classification system using six categories was used for field recording. The distribution of land uses and the density of development were then compared to norms reported for other communities.

Data for land value analysis were obtained from the assessor's office for properties which were sold at least twice in the last ten years and for which the value of improvements had not changed. Earlier records were inadequate due to incomplete recording procedure. Assessed valuation and the value of tax stamps were recorded for each parcel sold to determine the relative reliability of these values. A twenty percent sample of purchases was randomly selected to test the reliability of tax stamp reporting. An area adjacent to the Interstate right-of-way was selected for comparison with a control area located on the north city limits and believed to be relatively free from the influence of the new route.

Population of the study area was related to county and state growth and compared with the population growth of other Pinal County communities. Population projections for Eloy were made and then reviewed to determine if the projection should be adjusted to reflect the influence of a by-pass, as experienced by other communities.

Since sales tax returns are not released for individual businesses, or as a total for each city, retail sales for Eloy were assumed to be the same relative proportion to county-wide sales as reported in the 1948, 1954, and 1958 Censuses of Business. (28) Projected population was then used to forecast design year sales activity for local business. Potential highway oriented sales activity was assumed to be directly proportional to through traffic volumes recorded for 1958 and projected for 1980.

A peak-hour parking study, of the business district, was conducted following procedures recommended by the Bureau of Public Roads. (29) The procedure involves four tours per hour along a preselected route through the business district. License numbers of parked vehicles were recorded on a Parking Study form prepared so

that block or area tabulations may be completed on each form. (See Appendix A, Tables XXIV through XXVI. In conjunction with the parking study, an inventory was taken of business district parking spaces. Calculations of turnover, usage, and accumulation determined the adequacy of present facilities. Projected population and sales were then used as the basis of determining future parking demand.

Traffic volume counts, for the preceding 20 years, were obtained for three locations in the Eloy area. Counts for three other locations, where secondary roads intersect State Highway 84, were obtained for 4 years, and counts through Eloy were obtained for 13 years. Future traffic volumes were then projected to the design year using state-wide projections of population (30) and Arizona Highway Department traffic projection factors and projected vehicle registration. (31)

Turning movement manual counts for the peak hours were made for the intersection of Main Street and State Highway 84. These traffic volumes were then related to the 24-hour volumes to determine the 24-hour volumes attracted to and through the business district. The relationship was projected to find the design year volumes through the Eloy business district.

Finally, the projected dependent variables were compared with those from "after studies" in other communities as a check on their validity.

Chapter 4

PRESENTATION OF DATA

4.1 Land Use

A base map, (scale 1" = 200') of Eloy was used to scale the area of the various land uses as of 1962. Table I shows the distribution of the land use categories in Eloy by acreage. The 1962 Land Use in Eloy is shown in Figure 4.1.

TABLE I

LAND-USE DISTRIBUTION, ELOY, ARIZONA

	Acres	Percent Of City Area	Percent Of Developed Area
Single Family	147.57	16.83	27.12
Intensive Residential	51.58	5.89	9.48
Commercial	39.55	4.51	7.27
Industry	15.50	1.77	2.85
Public and Quasi-Public	58.89	6.49	10.45
Streets	231.71	26.66	45.93
Vacant	331.80	37.85	—
Total	876.60	100.00	100.00

4.2 Land Value

Sales records for the subdivisions of Eloy are shown in Tables II through IV and the boundaries of each subdivision are shown in Figure 4.2. Tables II through IV also show the acreage of each plot sold.

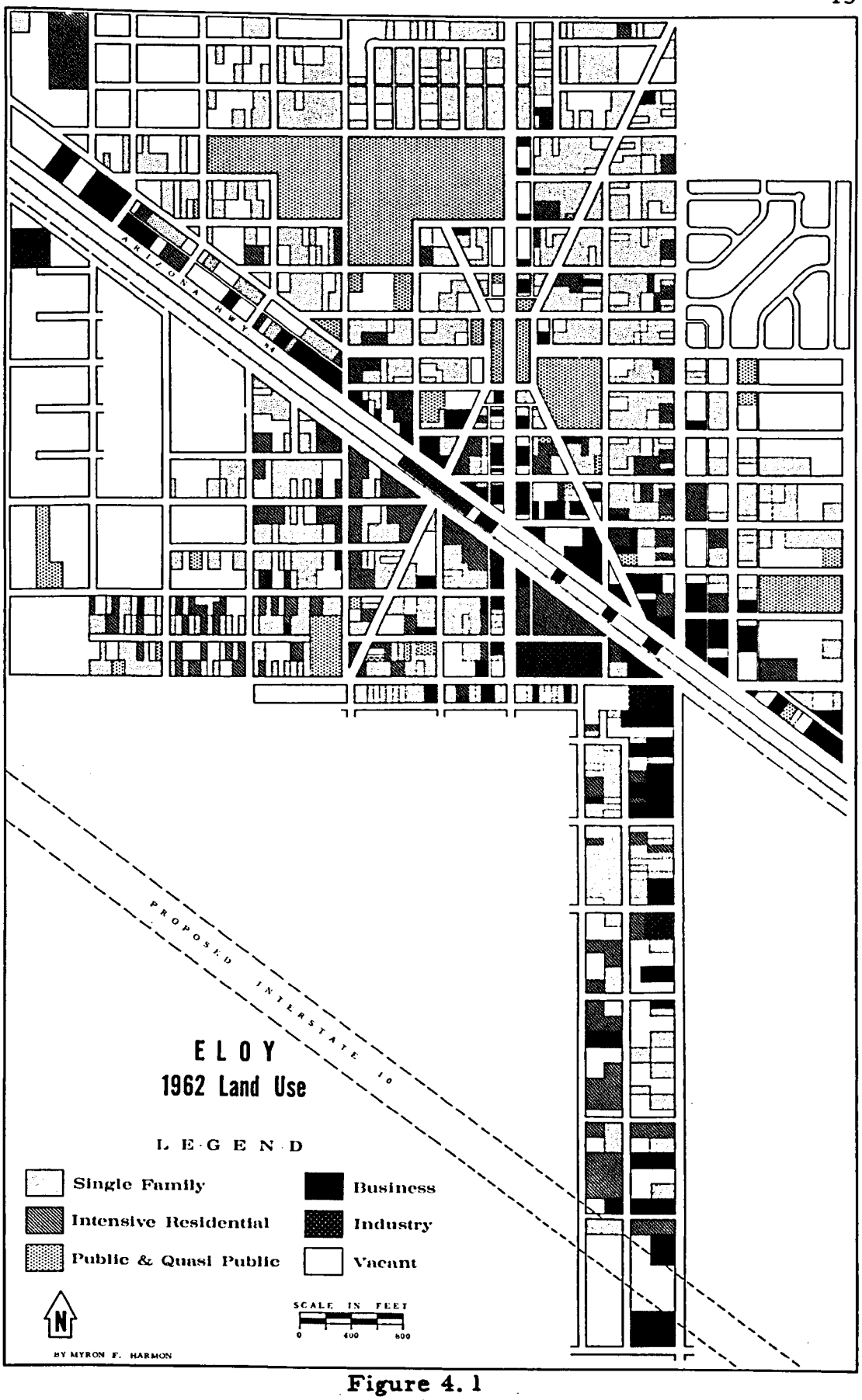

ARIZONA HWY 84
PROPOSED INTERSTATE 10
ELOY
1962 Land Use
LEGEND
Single Family
Intensive Residential
Public & Quasi Public
Business
Industry
Vacant
N
SCALE IN FEET
0
400
800
BY MYRON F. HARMON

Figure 4.1

TABLE II

TAX STAMPS ON SALES - COTTON CITY PROPER

Sale No.	Acres	Years (1951 thru 1962) 51	52	53	54	55	56	57	58	59	60	61	62
1	0.21	-	-	-	1	-	-	-	-	-	1	-	-
2	0.17	-	-	-	-	-	1	-	-	-	-	1	-
3	0.12	-	-	-	-	-	-	-	5	5	-	-	-
4	0.12	-	-	-	1	-	1	-	-	-	1	-	-
5	0.17	-	-	-	-	-	-	12	10	-	-	-	-
6	0.17	-	-	1	-	-	-	-	1	-	-	1	-
7	0.17	-	-	-	-	-	5	-	-	-	5	-	6
8	0.52	-	-	-	-	-	-	-	3	-	-	6	-
9	0.17	-	-	-	-	4	4	-	-	-	-	4	-
10	0.12	-	-	-	-	-	-	8	-	-	-	8	-
11	0.17	-	-	2	-	-	-	-	-	-	-	-	3
12	0.17	-	-	1	-	-	-	-	-	-	-	1	-
13	0.17	-	2	-	-	-	-	-	-	-	1	-	1
14	0.17	-	-	-	1	1	-	-	1	-	-	-	1
15	0.14	-	2	-	-	-	-	-	-	-	-	3	-
16	0.17	-	-	-	1	-	-	-	-	-	1	-	-
17	0.14	-	-	-	-	-	-	-	-	-	3	-	4
18	0.14	-	-	-	-	-	7	-	-	-	7	-	-
19	0.12	2	-	2	3	-	4	-	-	-	-	4	-
20	0.12	1	-	-	-	-	-	-	-	2	-	1	-
21	0.17	-	-	-	1	-	-	-	-	-	-	1	-
22	0.12	-	1	-	-	-	-	1	-	-	1	-	-
23	0.12	1	-	-	-	-	-	-	-	-	-	1	-
24	0.12	1	-	-	-	-	-	-	-	-	-	2	-
25	0.22	2	-	-	-	2	-	-	2	-	-	3	-
26	0.14	-	-	-	1	-	-	-	-	-	-	-	1
Total Sales		5	3	4	7	3	6	3	6	2	8	13	6

TABLE III

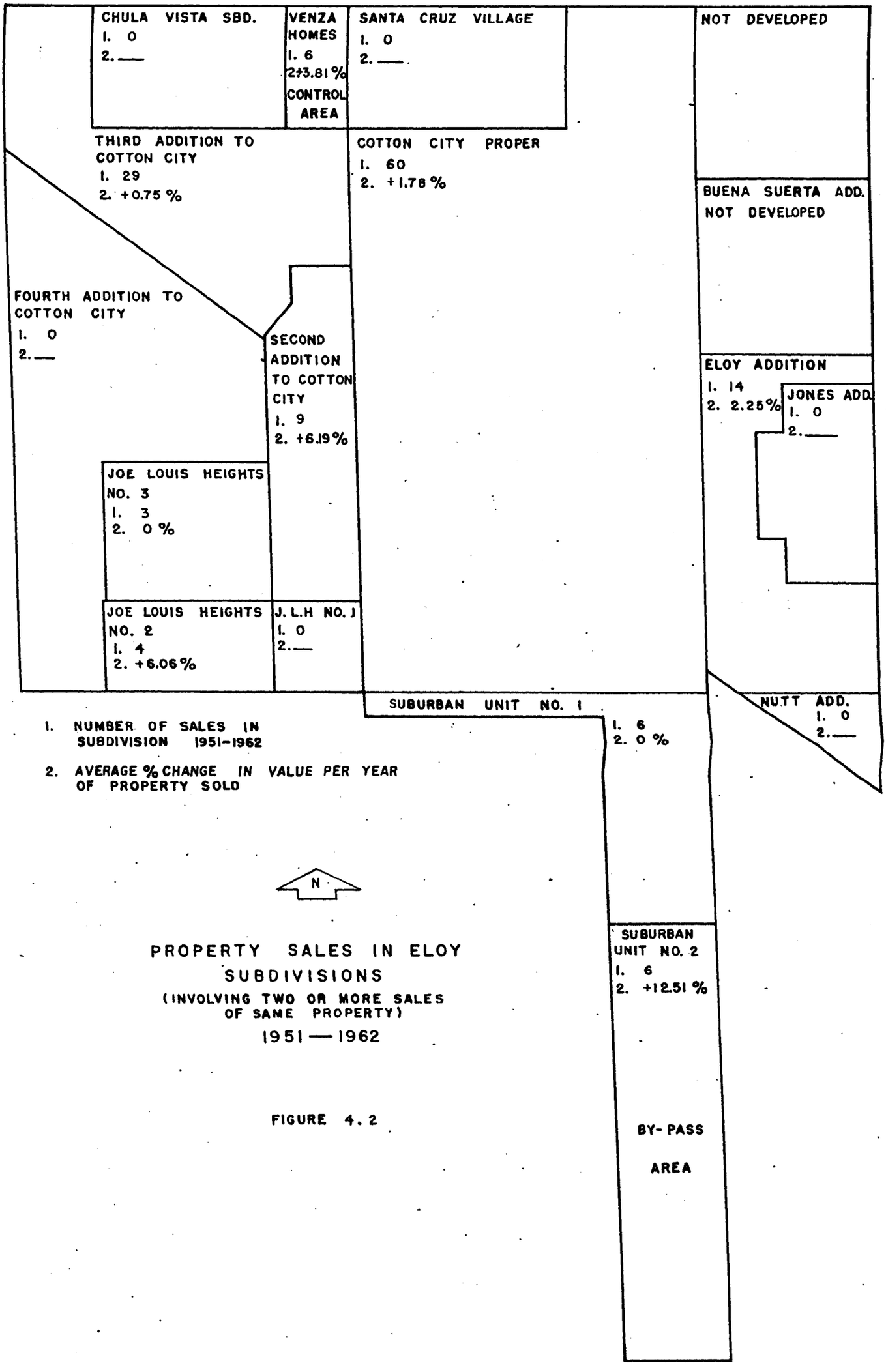
TAX STAMPS ON SALES - COTTON CITY ADDITION

Sale No.	Acres	Years (1951 thru 1962) 51	52	53	54	55	56	57	58	59	60	61	62
1	0.17	-	-	-	-	1	-	-	-	-	-	-	2
2	0.37	-	-	-	-	2	-	-	-	-	-	-	2
3	0.36	-	-	-	-	1	-	-	2	-	-	3	-
4	0.36	-	-	-	2	-	-	-	-	-	-	-	2
5	0.17	-	-	-	-	1	-	1	1	-	-	3	-
6	0.17	-	-	-	-	-	-	5	-	-	-	3	-
7	0.17	1	-	-	-	1	1	-	-	1	-	-	1
8	0.17	-	1	-	-	1	1	-	-	-	1	-	1
9	0.57	-	4	-	-	-	-	-	-	-	-	4	-
10	0.34	-	-	2	-	-	-	-	-	-	-	2	-
11	0.17	-	-	-	5	-	-	-	-	-	-	-	6
12	0.31	-	-	-	4	-	-	-	4	2	2	-	-
13	0.17	-	-	-	-	-	10	-	-	-	-	-	8
Total Sales		1	2	1	3	6	2	2	3	2	2	5	7

TABLE IV

TAX STAMPS ON SALES - OTHER ADDITIONS

Sale No.	Acres	Years (1951 thru 1962) 51	52	53	54	55	56	57	58	59	60	61	62
Eloy													
1	0.27	-	-	-	1	-	-	-	-	-	-	-	2
2	0.27	-	-	-	1	-	-	-	-	-	-	-	2
3	0.09	-	-	-	1	-	-	-	-	-	-	-	1
4	0.17	-	-	14	15	-	-	-	12	-	-	-	-
5	0.69	2	-	-	-	-	3	-	-	-	-	-	2
6	0.59	-	-	-	-	18	-	-	-	-	18	-	-
Louis 2													
1	0.17	-	-	-	1	-	-	-	-	-	-	1	-
2	0.15	-	-	-	-	-	1	-	-	-	2	-	-
Louis 3													
1	0.17	1	-	-	-	-	1	-	-	-	-	1	-
S.U.1													
1	0.17	-	-	-	-	-	1	-	-	-	-	-	1
2	0.19	-	1	-	-	-	-	-	-	-	-	1	-
3	0.19	-	-	-	-	-	4	-	-	-	-	4	-
S.U.2													
1	0.17	-	-	-	-	1	-	-	-	-	-	4	-
2	0.12	-	-	-	-	-	-	2	-	-	-	-	2
3	0.17	-	-	-	-	-	-	2	-	-	-	-	2
Venza													
1	0.22	-	-	-	3	-	-	-	-	-	-	4	-
2	0.22	-	-	-	2	-	-	-	-	-	-	3	-
3	0.22	-	-	-	-	-	-	16	-	-	-	16	-
Total Sales		2	1	1	7	2	5	3	1	-	2	8	7



1. NUMBER OF SALES IN SUBDIVISION 1951–1962
2. AVERAGE % CHANGE IN VALUE PER YEAR OF PROPERTY SOLD

PROPERTY SALES IN ELOY SUBDIVISIONS
(INVOLVING TWO OR MORE SALES OF SAME PROPERTY)
1951 — 1962

FIGURE 4.2

Table V shows the tax stamp mean value and the group number used to indicate this mean in the above Tables. It is interesting to note that 55 properties were sold a total of 143 times during the ten years studied.

TABLE V

TAX STAMP MEAN VALUES

Group No.	Stamp Value	Mean Sale Value	Group No.	Stamp Value	Mean Sale Value
1	0.55	750	10	5.50	5,250
2	1.10	1,250	11	6.05	5,750
3	1.65	1,750	12	6.60	6,250
4	2.20	2,250	13	7.15	6,750
5	2.75	2,750	14	7.70	7,250
6	3.30	3,250	15	8.25	9,750
7	3.85	3,750	16	8.80	8,250
8	4.40	4,250	17	9.35	8,750
9	4.95	4,750	18	9.90	9,250

Assessed evaluation was not used as a guide in determining land value since no continual program of up-dating is currently employed by the assessors office.

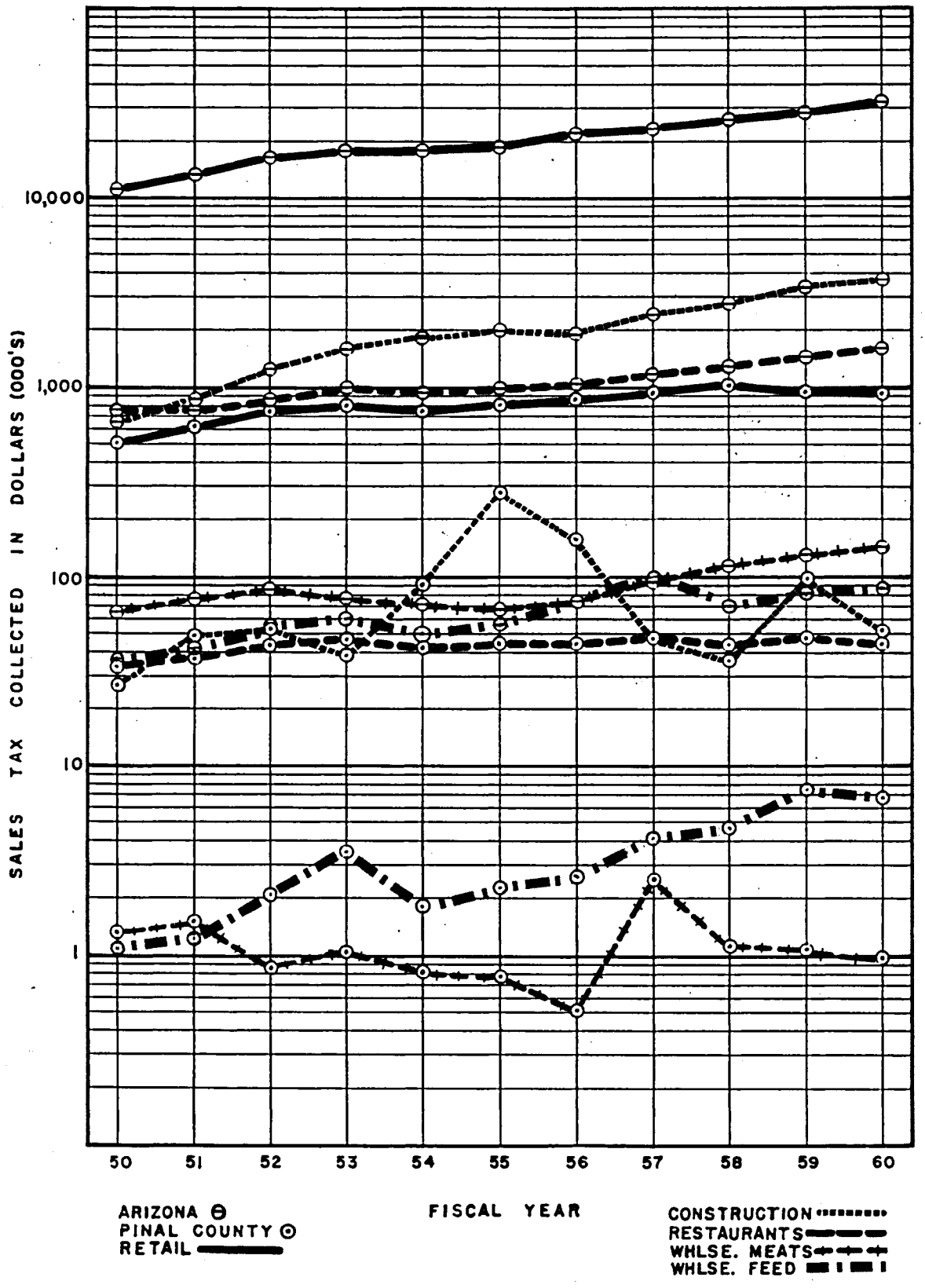
4.3 Retail Sales

Retail sales tax statistics for five selected categories were used in conjunction with the Census of Business data to explore sales activity relationships existing between the communities of Pinal County and between the county and Arizona. Sales tax collections for eleven years are shown in Table VI. Figure 4.3 shows the relative rates of increase for the five categories by state and county. Trends, in retail and service trade sales, (28) are evident in Table VII which indicates

TABLE VI

SALES TAX COLLECTED FROM SELECTED SOURCES
FOR ARIZONA AND PINAL COUNTY, 1950-1960

Fiscal Year July 1 to June 30		Pinal County Taxes, Dollars	Pinal County % Of Total Tax	Arizona Taxes, Dollars	Arizona % Of Total Tax
50	Restaurants	34,043	4.26	712,505	4.43
	Whlse Meats	1,315	0.16	64,222	0.40
	Contracting	28,018	3.50	654,935	4.07
	Whlse Feed	1,157	0.15	38,790	0.24
	Retail	516,882	64.64	11,501,788	71.43
51	Restaurants	38,494	3.64	791,282	4.21
	Whlse Meats	1,438	0.14	73,707	0.39
	Contracting	49,946	4.73	933,714	4.97
	Whlse Feed	1,354	0.13	46,901	0.25
	Retail	638,449	60.44	14,446,418	71.65
52	Restaurants	43,507	3.63	878,703	3.96
	Whlse Meats	885	0.07	89,540	0.40
	Contracting	51,406	4.29	1,194,313	5.38
	Whlse Feed	2,062	0.17	58,796	0.27
	Retail	763,322	63.64	15,851,574	71.42
53	Restaurants	48,562	3.63	966,569	3.97
	Whlse Meats	1,028	0.08	78,763	0.32
	Contracting	44,712	3.47	1,568,236	6.45
	Whlse Feed	3,410	0.27	60,034	0.25
	Retail	821,449	63.79	17,209,144	70.73
54	Restaurants	44,236	3.28	945,013	3.81
	Whlse Meats	820	0.06	72,645	0.29
	Contracting	92,853	6.87	1,753,154	7.06
	Whlse Feed	1,849	0.14	52,214	0.21
	Retail	767,383	56.81	17,364,388	69.91
55	Restaurants	45,061	2.77	986,872	3.64
	Whlse Meats	797	0.05	69,259	0.26
	Contracting	242,936	14.94	2,076,996	7.65
	Whlse Feed	2,212	0.14	58,555	0.26
	Retail	811,488	49.89	18,297,262	67.40
56	Restaurants	45,697	2.36	1,095,071	3.44
	Whlse Meats	510	0.03	74,295	0.23
	Contracting	156,387	8.07	1,995,457	6.28
	Whlse Feed	2,646	0.14	76,480	0.24
	Retail	888,164	45.84	21,193,275	66.64
57	Restaurants	49,132	2.51	1,193,179	3.45
	Whlse Meats	1,616	0.08	95,723	0.28
	Contracting	49,605	2.53	2,504,045	7.23
	Whlse Feed	4,208	0.21	101,734	0.29
	Retail	963,371	49.12	23,438,884	67.69
58	Restaurants	46,163	2.37	1,291,245	3.57
	Whlse Meats	1,128	0.06	111,578	0.33
	Contracting	40,905	2.10	2,863,530	7.92
	Whlse Feed	4,712	0.24	69,018	0.19
	Retail	1,046,919	53.79	25,076,618	69.37
59	Restaurants	49,521	2.29	1,434,422	3.45
	Whlse Meats	1,096	0.05	124,805	0.32
	Contracting	98,819	4.58	3,319,910	7.78
	Whlse Feed	7,500	0.35	82,530	0.20
	Retail	960,565	44.49	28,799,993	69.32
60	Restaurants	46,520	2.65	1,558,168	3.58
	Whlse Meats	994	0.06	137,017	0.32
	Contracting	53,309	3.04	3,385,075	7.78
	Whlse Feed	6,581	0.38	86,381	0.20
	Retail	958,543	54.58	30,485,924	70.07



SELECTED SALES TAX COLLECTIONS, 1950-1960
ARIZONA & PINAL COUNTY

FIGURE 4.3

the lack of growth in Eloy when compared to nearby communities and to the county.

TABLE VII

TRENDS IN RETAIL AND SERVICE SALES

Sales (000's)

	1948	1954	1958
Eloy	$ —	$ 4, 227	$ 4, 221
Coolidge	6, 588	10, 474	11, 435
Casa Grande	8, 237	15, 336	19, 344
Pinal County	25, 941	46, 301	56, 130

4.4 Population

The population data for Arizona, Pinal County, Eloy, Casa Grande, Coolidge, and Florence, for the census years 1920 to 1960 are presented in Table VIII. Table IX reflects the growth rates from census to census for the various political divisions. The percentage relationships between the state and county population and between Pinal County and the study cities are given in Table X. Population data, prior to 1950, were not available for either Coolidge or Eloy.

Population figures for Pinal County, Eloy, Casa Grande, and Coolidge, do not reflect the high seasonal influx of agriculture workers nor are these workers considered when making population projections for this study. Distortion of projections would result if these seasonal workers were added to the permanent population.

TABLE VIII

POPULATION STATISTICS

Year	Arizona	Pinal County	Casa Grande	Florence	Coolidge	Eloy
1920	334, 162	16, 130	948	1, 161	-	-
1930	435, 523	22, 031	1, 351	1, 318	-	-
1940	499, 261	28, 841	1, 545	1, 383	-	-
1950	749, 587	43, 191	4, 181	1, 776	4, 306	3, 580
1960	1, 302, 161	62, 673	8, 311	2, 143	4, 990	4, 899.
1970	2, 135, 000*					
1980	3, 425, 000*					

* ARIZONA STATISTICAL REVIEW, Valley National Bank, September 1962.

TABLE IX

PERCENT CHANGE FROM PRECEDING CENSUS

Year	Arizona	Pinal County	Casa Grande	Florence	Coolidge	Eloy
1930	+ 30.40	+ 36.8	+ 42.51	+ 13.54	-	-
1940	+ 14.62	+ 30.9	+ 14.41	+ 3.4	-	-
1950	+ 50.20	+ 49.7	+ 170.1	+ 28.4	-	-
1960	+ 73.81	+ 31.2	+ 98.8	+ 20.66	+ 15.9	+ 36.84

TABLE X

POPULATION RATIOS

Year	Pinal County As % Arizona	Percent of Pinal County			
		Casa Grande	Florence	Coolidge	Eloy
1920	4.83	5.88	7.20	—	—
1930	5.06	6.12	5.97	—	—
1940	5.78	5.31	4.86	—	—
1950	5.76	9.68	4.11	9.97	8.29
1960	4.82	13.26	3.42	7.84	7.82

4.5 Parking

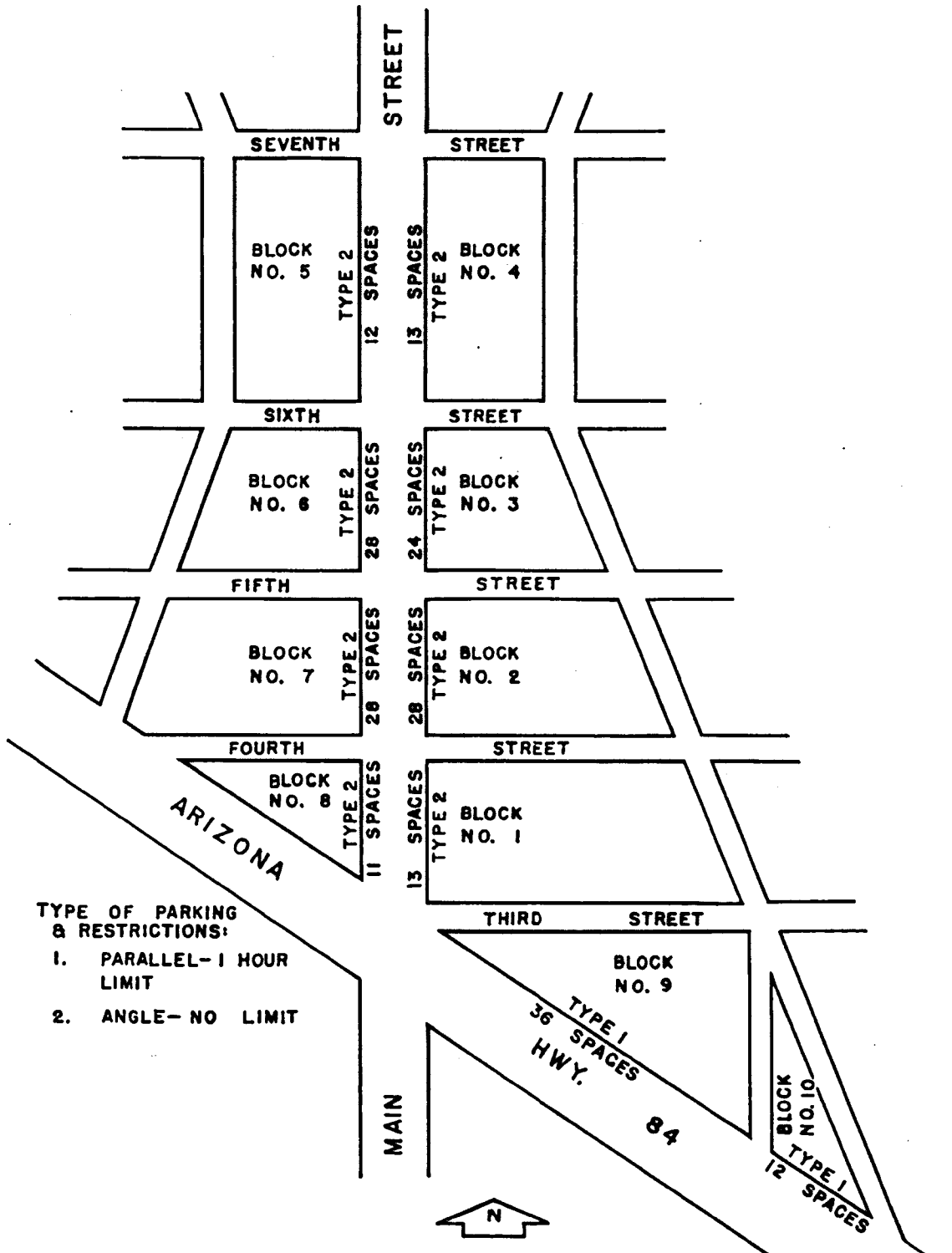
Inventories of curb parking in the Central Business District of Eloy were obtained for the hours from 2:00 P. M. to 4:00 P. M. Figure 4.4 gives the block layout and numbering system for the parking study. The parking accumulations are shown in Figure 4.5 and Parking Usage Records are given in Table XXVII through Table XXVIV in Appendix III. Table XI is a recapitulation of data for the one-hour restricted parking zones and for the unrestricted zones.

TABLE XI

SUMMARY OF PARKING SUPPLY, USAGE, AND OCCUPANCY, 2-4 P. M.

Restrictions	Supply		Usage		
	Spaces	Space-Hours	Vehicles	Space Hours	Percent Occupancy
1-hour	44	88	79	32.25	36.65
None	157	314	137	78.00	24.84

Table XII shows the numbers of vehicles parked for indicated periods in the two types of zones and the average time parked per vehicle.



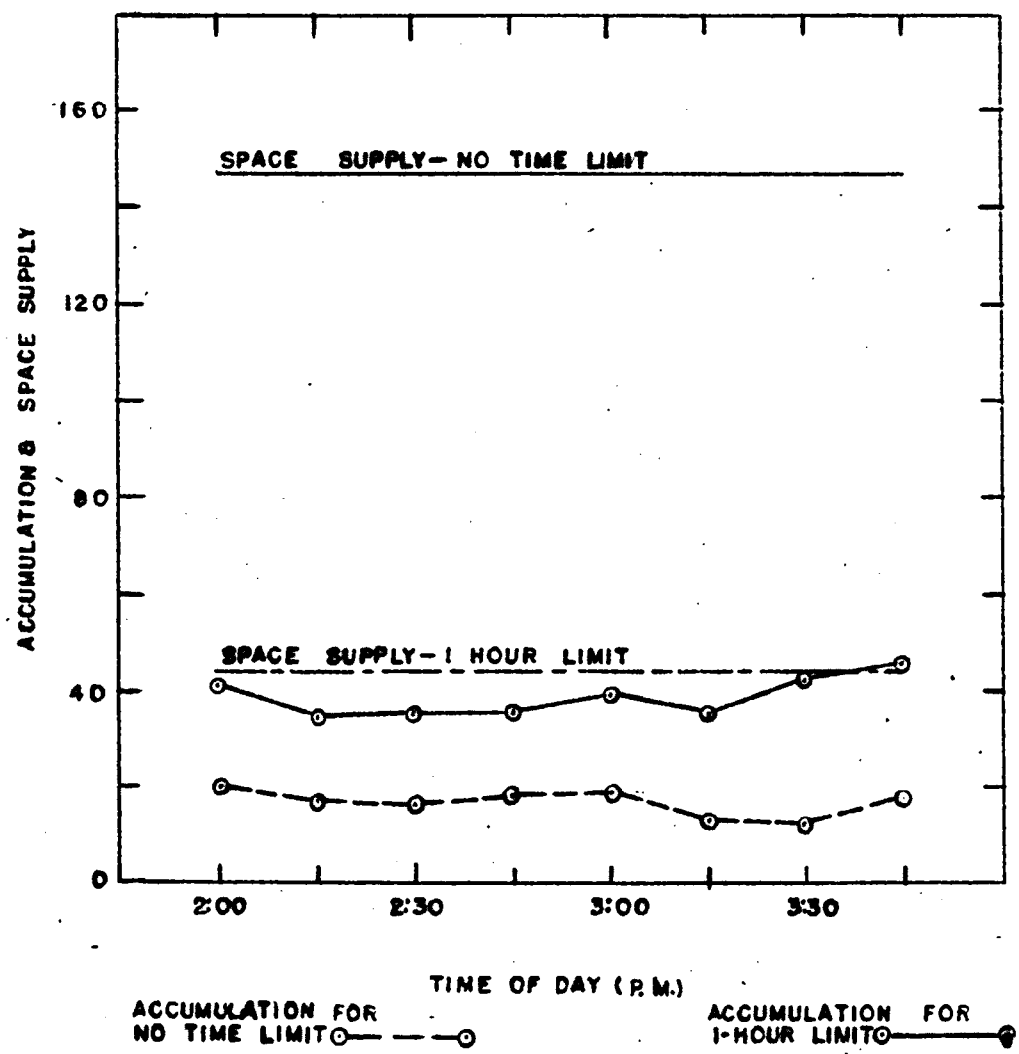
EXISTING PARKING FACILITIES
ELOY-1960

FIGURE 4.4

TABLE XII

DURATION OF PARKING FOR OBSERVED VEHICLES, 2-4 P. M.

Type Of Restriction	0-30 Min.	30-60 Min.	60-90 Min.	90-120 Min.	Average Duration-Min.
1-hour	69	7	1	2	24.5
None	97	24	16	10	34.4



PARKING ACCUMULATION

FIGURE 4.5

4.6 Traffic Volumes

Automatic traffic volume counts for locations in Eloy are given in Table XIII. Traffic counts for all highways, in the Eloy area, are shown graphically on Figure 4.6.

Manual turning movement counts at the intersection of Arizona 84 and Main Street in Eloy for the evening peak hour and for the 4:00 P.M. to 6:00 P.M. period are illustrated on the Intersection Volume Forms shown in Figures 4.7, 4.8, and 4.9. Table XIV is a recapitulation of the peak hour movements at the intersection for a weekday.

TABLE XIV

DIRECTIONAL TRAFFIC FLOW DURING PEAK HOUR, 1961

	Rt Turn, %	Lt Turn, %	Thru, %	Vehicle Total
NW Bound (84)	3.03	15.67	81.30	198
SE Bound (84)	28.10	18.05	53.85	310
N Bound	29.65	18.72	51.63	135
S Bound	37.05	17.33	37.05	81

Comparing the peak hour, non-directional flow (508) on Arizona 84 with the ADT of 8,245 (Table XIII), directs attention to the low percentage of peak flow often found in small communities located on major highways.

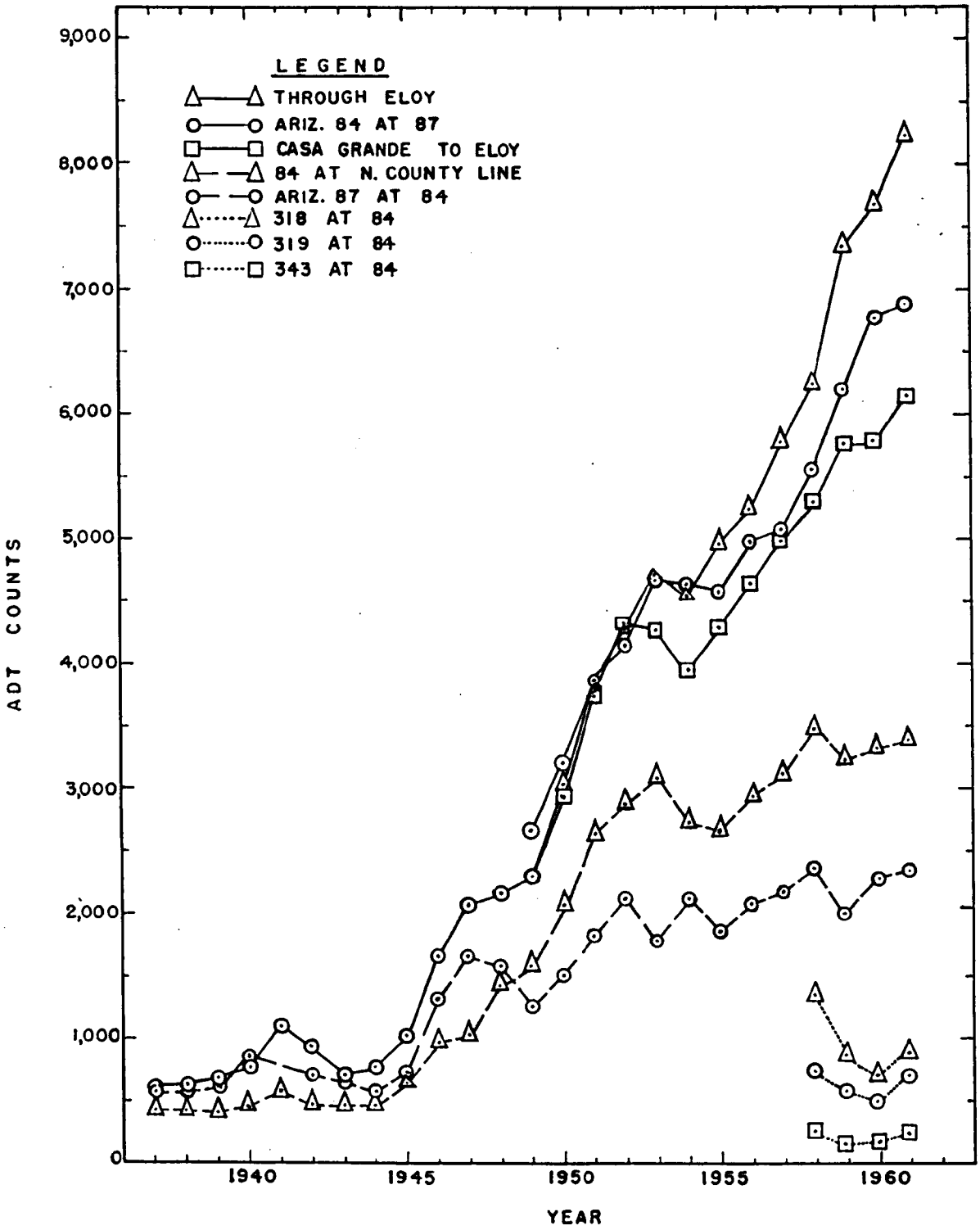
TABLE XIII

AVERAGE DAILY TRAFFIC IN ELOY AREA

Year	Casa Grande -County Line	US 84 at Ariz. 87	C.G. To Eloy	Through Eloy	Ariz. 87 At Junction	Hwy. 318 at 84	Hwy. 319 at 84	Hwy. 343 at 84
1937	425	620	-	-	555			
1938	427	632	-	-	581			
1939	410	667	-	-	610			
1940	458	796	-	-	852			
1941	584	1, 109	-	-	1, 057			
1942	485	942	-	-	702			
1943	453	719	-	-	651			
1944	457	777	-	-	564			
1945	656	1, 034	-	-	730			
1946	960	1, 674	-	-	1, 321			
1947	1, 031	2, 080	-	-	1, 661			
1948	1, 415	2, 162	-	-	1, 567			
1949	1, 579	2, 324 (1)	2, 340 (2)	2, 663 (2)	1, 256			
1950	2, 077	3, 042	2, 944	3, 204	1, 503			
1951	2, 656	3, 862	3, 445	3, 762	1, 810			
1952	2, 894	4, 154	4, 328	4, 268	2, 131			
1953	3, 086	4, 676	4, 262	4, 717	1, 799			
1954	2, 712	4, 628	3, 925	4, 525	2, 115			
1955	2, 665	4, 571	4, 289	4, 956	1, 863			
1956	2, 940	4, 984	4, 624	5, 235	2, 078			
1957	3, 137	5, 084	4, 995	5, 765	2, 170			
1958	3, 476	5, 556	5, 291	6, 247	2, 358	1, 343	732	239
1959	3, 214	6, 206	5, 755	7, 351	1, 998	838	561	125
1960	3, 323	6, 775	5, 778	7, 695	2, 274	676	480	148
1961	3, 375	6, 895	6, 168	8, 245	2, 334	878	689	220

(1) From Eloy to Junction

(2) The difference between these two is volume generated by Eloy



ADT. ON HIGHWAYS—ELOY AREA

FIGURE 4.6

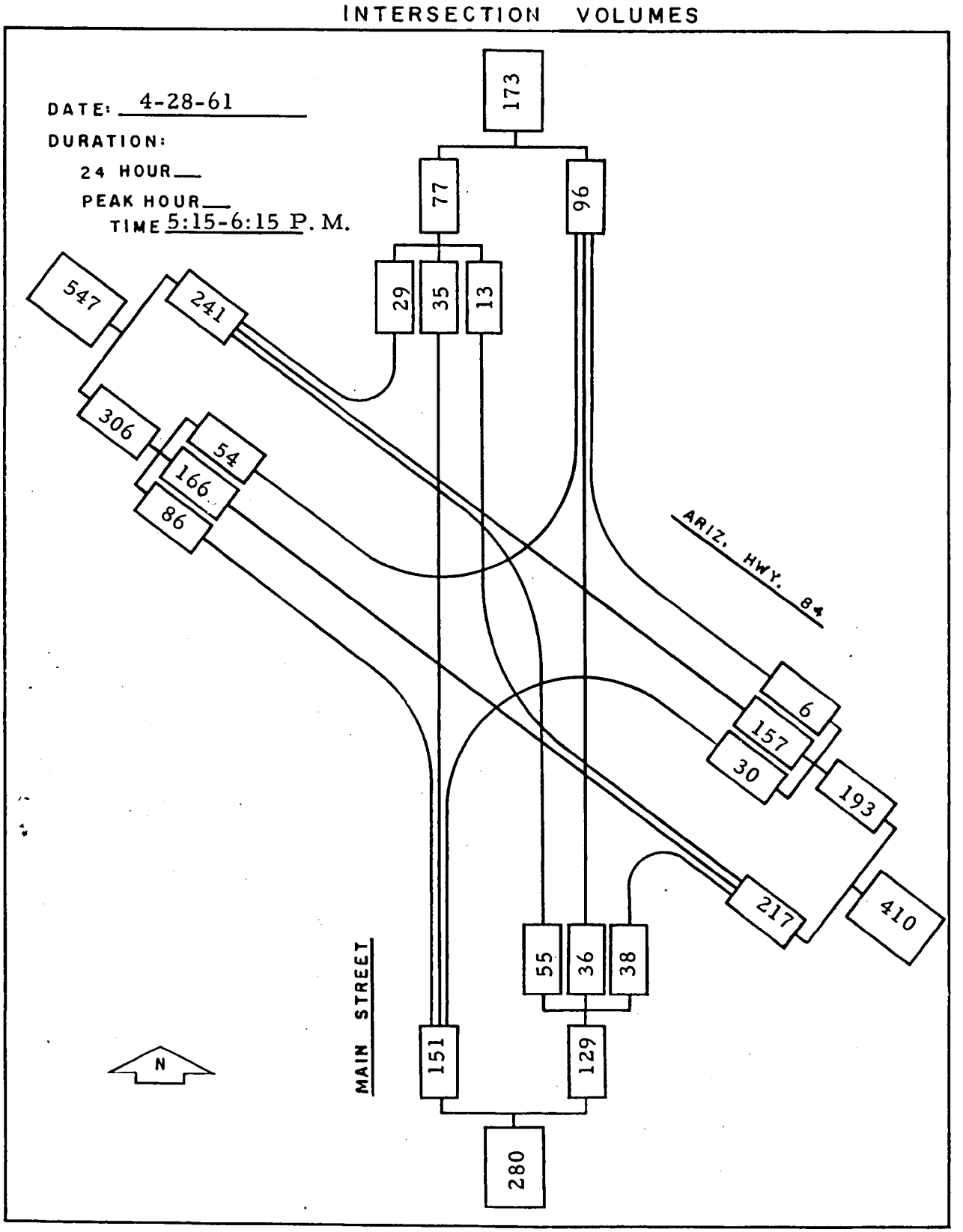

INTERSECTION VOLUMES
DATE: 4-28-61
DURATION:
24 HOUR
PEAK HOUR
TIME 5:15-6:15 P. M.
173
77
96
29
35
13
547
241
306
54
166
86
ARIZ. HWY. 84
6
157
30
193
217
410
55
36
38
MAIN STREET
151
129
280
N

FIGURE 4.7

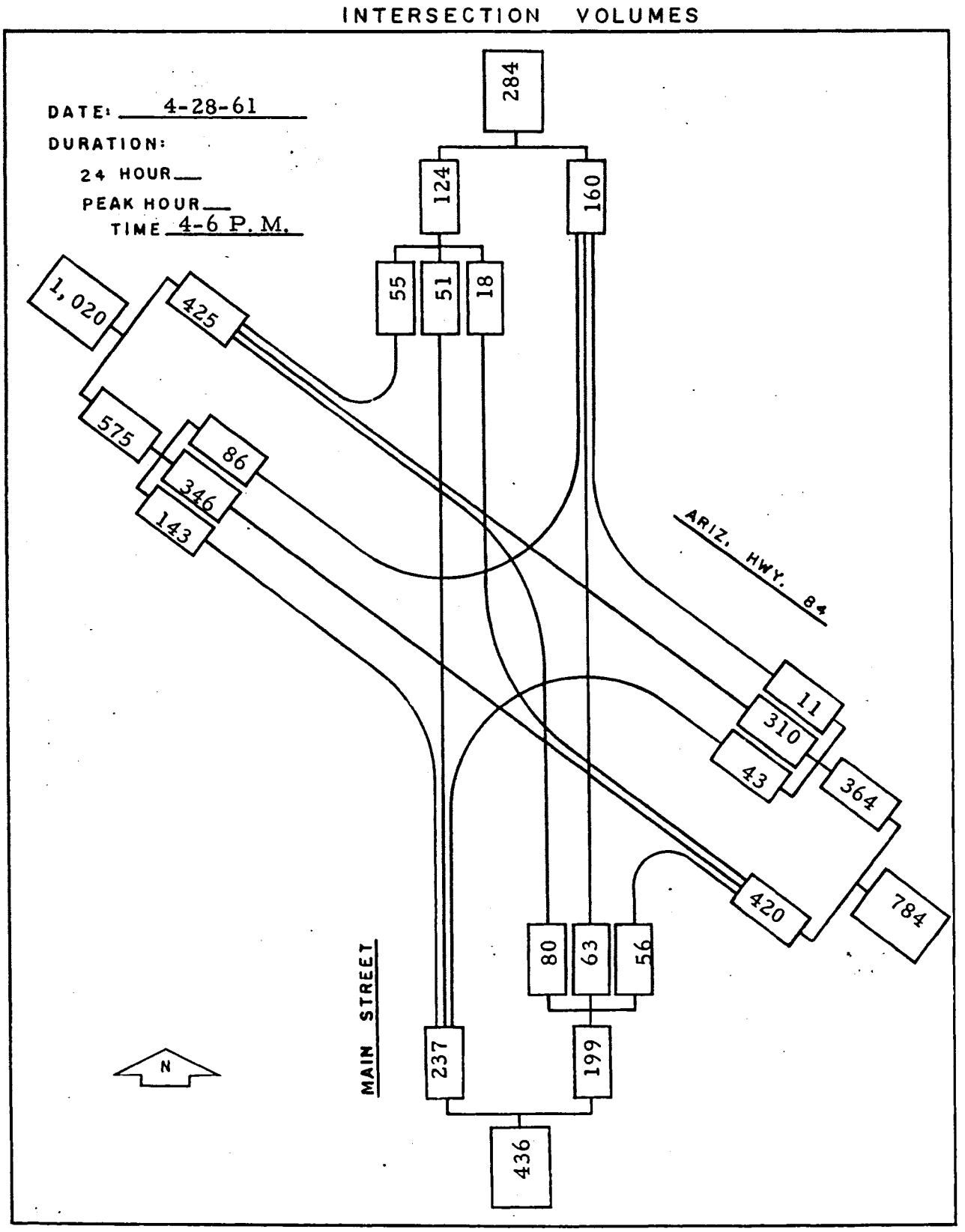

INTERSECTION VOLUMES
DATE: 4-28-61
DURATION:
24 HOUR
PEAK HOUR
TIME 4-6 P.M.
284
124
160
55
51
18
1,020
425
575
86
346
143
ARIZ. HWY. 84
11
310
43
364
420
784
80
63
56
MAIN STREET
237
199
436
N

FIGURE 4.8

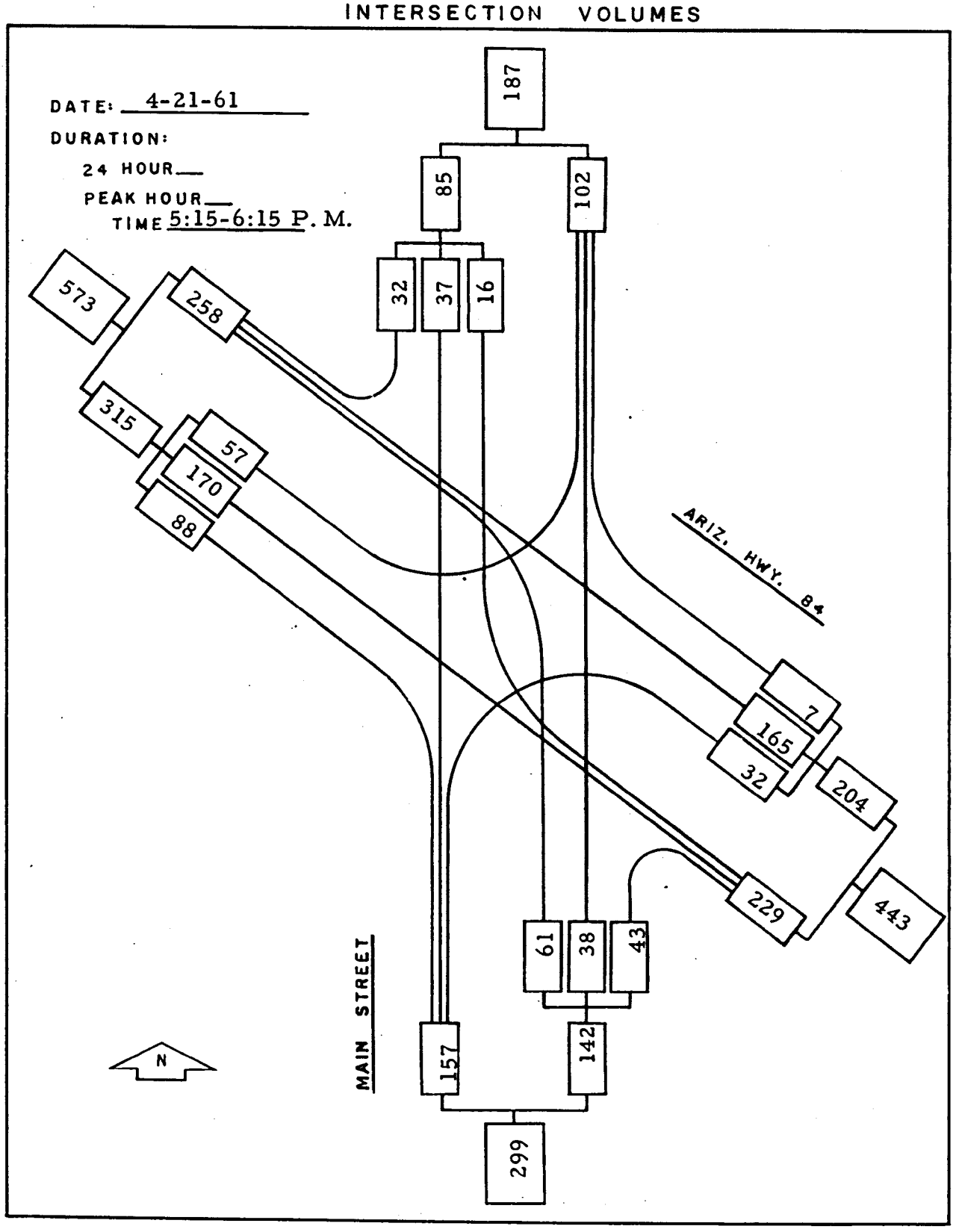

INTERSECTION VOLUMES
DATE: 4-21-61
DURATION:
24 HOUR
PEAK HOUR
TIME 5:15-6:15 P. M.
187
85
102
32
37
16
573
258
315
57
170
88
ARIZ. HWY. 84
7
165
32
204
229
443
61
38
43
MAIN STREET
157
142
299
N

FIGURE 4.9

Chapter 5

ANALYSES OF DATA

5.1 Relationships Between Variables

Interactions between the dependent variables are evident from analyses of the data. The interaction is not always of the same degree; for instance, retail sales for an area are closely related to area population and median income, but retail sales are related directly to land value only for those uses where sales activity is involved.

Land use and land values are closely related to the economic stability of a community. In the eleven-year period, 1951-1962, property sales showed little evidence of a strong economy. Figure 4.2, recapitulates the sales involved in this study, and shows the small increase in value of property. The percentage increases are not adjusted for inflationary influences.

The slight demand for property is a result of the declining position of Eloy as a trading center and from the low median family income. Morgan states that, (3) "Eloy is a community characterized by substantial amounts of illiteracy, poverty , and unemployment". These socio-economic conditions are a factor in land use and land value. The relatively low percentage of developed land devoted to single family use (Table I) houses slightly more than one-half of the population. Approximately forty-four percent of the population reside on less than ten percent of the developed land. These figures result in densities of 21.6 persons per acre for single family use and 34.6 persons per acre for intensive residential use.

The population growth of 36.84 percent between 1950 and 1960 has not resulted in comparable growth for economic and travel-related factors. Retail and service trade sales (Table VII) remained at the same level from 1954 to 1958 while Pinal County registered a 21.2 percent increase. In 1954, Eloy sales were 9.1 percent of the county total. By 1958, Eloy's share of county sales had been reduced to 7.5 percent. This reduction in Eloy's share of county retail and service sales may be considered as an actual loss of approximately $900,000 gross sales by the merchants of Eloy from 1954 to 1958. Failure to maintain relative position in total county sales is inconsistent with the increase in through traffic volume unless that source of retail and service trade sales is of minor importance. It has been estimated that 23 percent of sales in Eloy are realized by establishments of the types patronized by highway travelers. (32)

Traffic volumes on the major highways (Figure 4.6) in the Eloy area have consistently increased. From Table XIII, it is evident that Eloy generated some 24.7 percent of the 1960 ADT on Arizona 84 through the community. In 1950, twelve percent of the traffic on Route 84 was generated by Eloy. Thus, intracity travel in Eloy on Route 84 increased 206 percent between 1950 and 1960. This was the most substantial increase displayed by any of the dependent variables considered in this study. Traffic through Eloy increased 141 percent from 1950 to 1960. This increase is in very good agreement with statewide increase in vehicle registration of 129.5 percent. During the same period, state population increased 73.8 percent, while Pinal County population increased only 31.2 percent.

The lack of a dynamic economy in Eloy is also reflected by the demand for parking facilities in the Central Business District. Occupancy and usage of parking spaces (Table XI) indicated a low demand

for parking space. Space occupancy between 2:00 and 4:00 P. M. varied from 24.84 percent for the non-restricted areas to 36.65 percent for the 1-hour restricted parking. Turnover for the parking facilities, Table XII, indicate the relatively short period of time that vehicles were parked. The low rate of parking demand is consistent with the static sales activity of the Eloy economy.

5.2 Projection of Population (Methods and Comparisons)

Population projection for a small area is difficult since all of the compensating factors existing in a large area are not present. The population projection, and the projections of all the study variables, were prepared assuming the basic premise that neither a national catastrophe nor a local disaster would occur during the projection period. This assumption does not decrease the difficulty encountered in small-area projections nor does it affect methods of projection. Two methods of projecting population were applied in deriving the best estimate of future population in Eloy:

1. Arithmetic Projection:
   This method is a straight line extension of past population growth. It assumes that the same increments of growth will occur in the future as did in the past.
2. Projection by Apportionment:
   This method relates local population growth to county and state population growth.

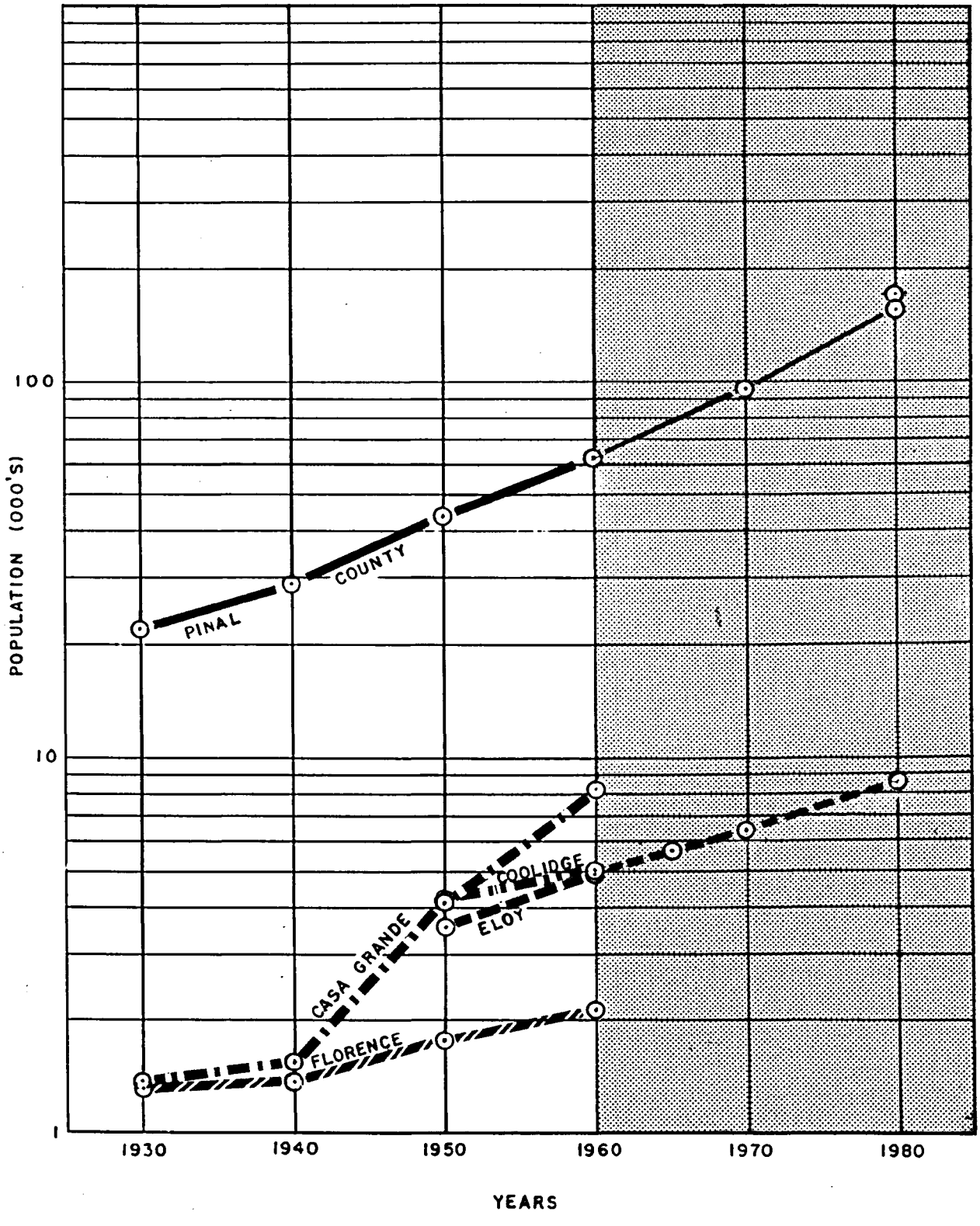
A straight line projection of population to 1980 for Eloy was based on the past growth record of other communities in Pinal County and the county itself, since Eloy population statistics were available from only two censuses. This method of estimating Eloy's population

results in an increase of 32.9 percent for each decade and places Eloy at 6,500 population in 1970 and at 8,650 population in 1980. This projection is shown graphically in Figure 5.1.

Projection of population by apportionment involves the trend of Eloy population in relation to county population and the trend for the county in relation to forecasts by other agencies for the state. The state population has been forecast at 2.135 million in 1970 and 3.425 million in 1980. (30) These projections place the prependerance of population in the metropolitan areas. As the metropolitan areas of Arizona have grown, farming areas have decreased in percentage of state population. Pinal County population was 5.78 percent of the state population in 1940, 5.75 percent in 1950, and 4.82 percent in 1960. It was assumed that this trend would continue at a reduced rate of decline due to the Phoenix-Tucson corridor growth.

A projection by apportionment, tempered by the above considerations, predicted that Pinal County would contain 4.5 percent of the state population in 1970 and 4.4 percent in 1980. On this basis, Pinal County population would increase to 97,000 by 1970 and to 151,000 by 1980. These estimates differ slightly from other estimates which have given more weight to the "impetus to move out of metropolitan areas". (32) The projected growth of Pinal County is shown in the shaded area of Figure 5.1 along with another estimate (32) for 1980.

Eloy population has declined as a percentage of county population. In 1950, Eloy accounted for 8.29 percent of Pinal County population while in 1960 the ratio dropped to 7.82 percent. It was assumed that this trend would continue and become more pronounced. It was estimated that an Eloy population of 6,400 would represent 6.60 percent of the county population in 1970. By 1980 the population would increase to 8,500, representing 5.54 percent of the county population. The



POPULATION GROWTH 1930–1980

FIGURE 5.1

results obtained by the two methods of projection thus compare very favorably. The initial population projection to the year 1980, which excluded the effect of the by-pass, was then reviewed considering the effect of the by-pass. As established in subsequent analyses, approximately five percent of Eloy's economic base is derived from highway oriented business. The number of employees required by these businesses, in the design year, will not significantly alter preliminary population projections. Therefore, the initial projection was left unchanged.

5.3 Traffic Projections

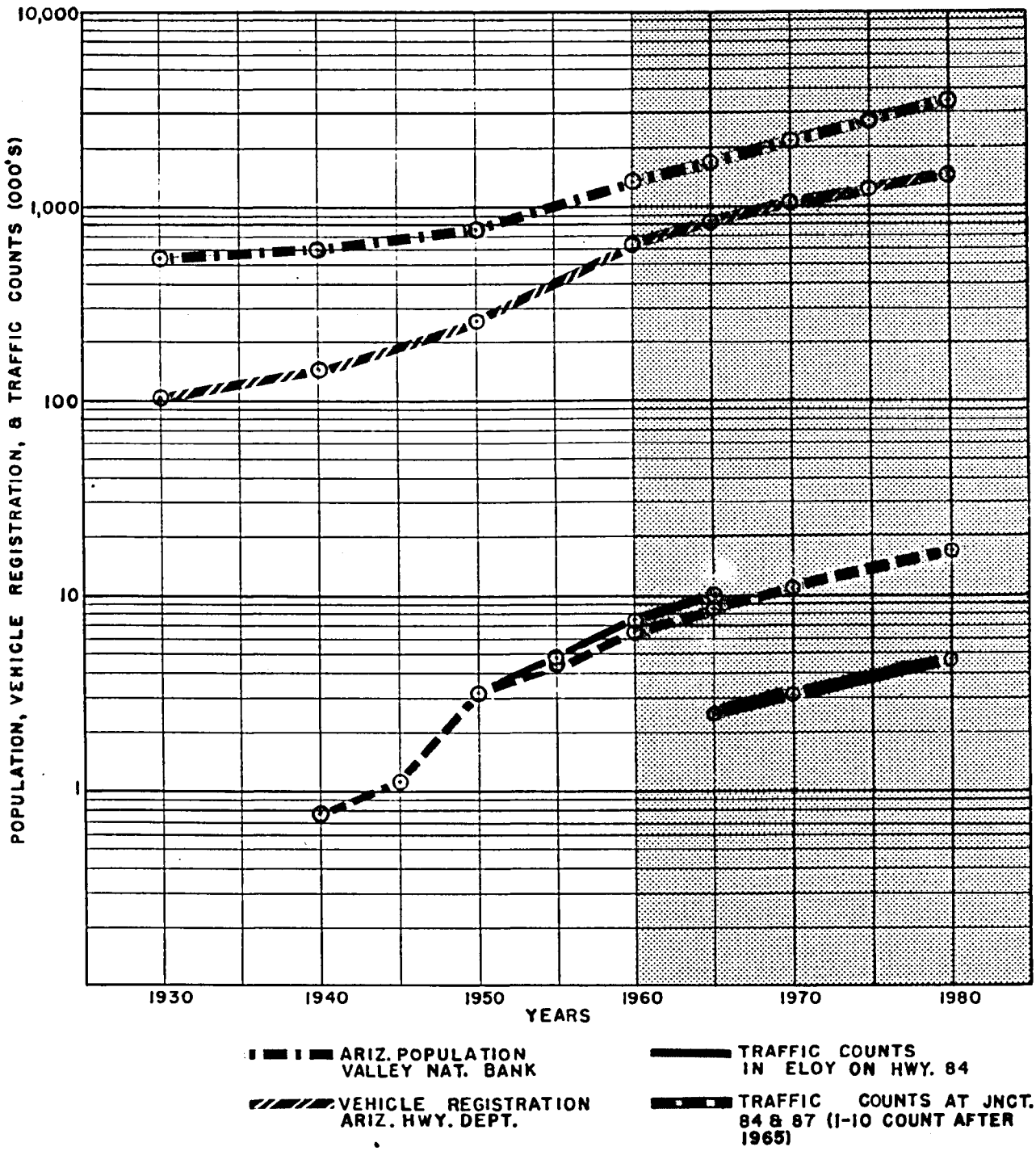
Traffic volumes on Arizona 84 through Eloy have increased proportionately to the growth of state population and vehicle registration (Figure 5.2). Rates of increase for the major Eloy area highways, as given in Table XV, result from extrapolation of population and vehicle registration curves from Figure 5.2.

TABLE XV

PERCENTAGE INCREASE IN TRAFFIC VOLUME FOR ELOY AREA MAJOR ROUTES

Years	Ariz. 84 at 87	Ariz. 84- Casa Grande To Eloy*	Ariz. 84- Through Eloy	Ariz. 87 at 84
40-45	+ 29.90	—	—	- 14.32
45-50	+ 194.19	—	—	+ 105.89
50-55	+ 50.26	+ 45.69	+ 54.68	+ 23.95
55-60	+ 48.22	+ 34.72	+ 55.26	+ 22.56
60-65	+ 35.00	+ 35.00	+ 35.00	—
65-70	—	+ 30.00	- 72.00	—
70-75	—	+ 25.00	+ 24.00	—
70-80	—	+ 25.00	+ 24.00	—

* After 1965 this column reflects increases on I-10 .



TRENDS IN ELOY TRAFFIC COUNTS, ARIZ. VEHICLE REGISTRATION & POPULATION

FIGURE 5.2

Historically, traffic volumes have increased at a faster rate than state population and at a rate comparable to vehicle registration. Therefore, the increase rates reflect the projected rates of change of vehicle registration from Table XVI and the projected change in state population from Figure 5.2. Thus for the period 1960-1965, vehicle registration is predicted to increase 30.98 percent and state population increase 27.85 percent. A comparable increase of 35 percent, was then applied to 1960 volumes of 6,775 ADT on Arizona 84 to obtain 1965 traffic volumes. The 1965 traffic volume on Arizona 84 through Eloy was then divided between Interstate and Arizona 84. The division was accomplished using the trends of traffic volume through Eloy in 1960. At that time, the ADT through Eloy was 1,917 vehicles higher than volume counts between Eloy and Casa Grande and 997 ADT higher than volume counts on Arizona 84 at the junction with Arizona 87. The 1960 traffic volume of 1,917 was then adjusted proportionately to the projected 1965 population using a factor of 1.25. Thus the 1965 volume on Arizona 84 is 1.25 times 1,917 or 2,390 ADT.

For the same periods, state vehicle registration figures have increased as shown in Table XVI.

TABLE XVI

PERCENTAGE INCREASE IN VEHICLE REGISTRATION

Years	Increase	Years	Increase*
40-45	+ 2.82	60-65	+ 30.98
45-50	+ 84.63	65-70	+ 23.71
50-55	+ 53.64	70-75	+ 19.17
55-60	+ 50.84	75-80	+ 13.85

* Forecast by Planning Survey Division, Arizona Highway Department. (33)

The traffic volume projections on Arizona 84 through Eloy show a discontinuity in 1965 as a result of the completion of the by-pass route. At that time, Interstate 10 traffic will be diverted thereby reducing abruptly the traffic volumes on State Highway 84. These projections indicate a traffic volume of 4, 550 on Arizona 84 in 1980. Interstate 10 will carry approximately 15, 800 vehicles, assuming that essentially all of the through traffic now using 84 and 87 will be diverted to the interstate route. The projected Interstate volume compares with a minimum of 9, 400 ADT and a maximum of 16, 550 ADT obtained by using Arizona Highway Department minimum and maximum increase factors of 1. 36 and 2. 40. These increase factors are based on extrapolation of curves for gasoline consumption and vehicle registrations for 1929-1960 inclusive and are calculated for each year through 1982 as shown in Table XVII. The predicted increase in vehicle volume on Interstate 10 at the Junction of 84 and 87, from 6, 775 ADT in 1960 to 15, 800 ADT in 1980 results in a comparable increase factor of 2. 34.

Traffic volumes, in 1980, are influenced in two ways by the existence of the by-pass route: (1) the presence of the by-pass will divert through traffic from Arizona 84 in Eloy, and (2) the by-pass, as a segment of Interstate 10, will receive traffic diverted to, and generated by the attractiveness of the complete alignment.

The 1960 peak hour directional volumes (Table XIV) indicated that approximately 175 vehicles used Main Street in going to and from the north end of town. This volume is assumed to be 10 to 12 percent of the 24-hour ADT of approximately 1, 500 vehicles on Main Street, the Central Business District. Applying an increase factor of 1. 7, derived from the projected population increase, results in a design year volume of 2, 600 ADT. Traffic volumes on Main Street are influenced directly by population distribution and are affected by the by-pass in proportion to its effect on population distribution.

TABLE XVII

TRAFFIC PROJECTION FACTORS*

Pinal County

Year	From 1961		From 1962	
	Min.	Max.	Min.	Max.
1962	1.04	1.06	-	-
1963	1.08	1.12	1.04	1.06
1964	1.12	1.18	1.08	1.11
1965	1.15	1.24	1.11	1.17
1966	1.18	1.30	1.14	1.23
1967	1.21	1.37	1.17	1.30
1968	1.24	1.44	1.20	1.36
1969	1.27	1.51	1.22	1.43
1970	1.30	1.58	1.25	1.50
1971	1.32	1.66	1.27	1.57
1972	1.34	1.73	1.28	1.64
1973	1.35	1.81	1.30	1.71
1974	1.36	1.89	1.31	1.79
1975	1.37	1.97	1.32	1.86
1976	1.38	2.05	1.32	1.94
1977	1.38	2.13	1.33	2.02
1978	1.38	2.22	1.32	2.10
1979	1.37	2.31	1.32	2.19
1980	1.36	2.40	1.31	2.27
1981	1.34	2.50	1.29	2.36
1982	1.32	2.59	1.27	2.45

* Planning Survey Division, Arizona Highway Department

The projected volume of 4,550 ADT generated by Eloy on Arizona 84 does not include intermediate stop trips by highway users which have been estimated to be approximately 500 in 1958. (32) Adjusting this volume to 1960 and applying an increase factor of 2.34 derived from the projected Interstate 10 increase results in a diverted 1980 traffic volume on Arizona 84 of approximately 1,650 vehicles. Adding this to the Eloy generated volume of 4,550 leads to a total 1980 count in Eloy of 6,200 ADT. This volume was not used since this study assumes that business establishments will relocate to obtain only 50 percent of the highway users business and that Arizona 84 will be superseded by a penetration route from Interstate 10.

5.4 Retail Sales Projection

Projection of retail sales involves two separate projections: a projection for highway oriented sales and a projection for locally oriented sales.

The projection of highway oriented sales was made using statewide expenditures by through travelers and data obtained in a traffic survey conducted by the Arizona Highway Department during 1958-1959, for purposes of locating Interstate 10, it was determined that 5.5 percent of the 1958-1959 ADT stopped in Eloy and that 36.7 percent of those stopping did so to purchase gasoline. (32) Thus an average of 137 vehicles stopped for gasoline on an average day for total retail gasoline sales of approximately $480; expanded, this amounts to 18.8 percent of the estimated sales per year of $865,000 for this category (32) and is 3.6 percent of total sales.

Sales of eating and drinking establishments to highway users are not obtainable unless county-wide expenditures are pro-rated for a smaller area. As shown in Figure 4.3, Pinal County restaurants have not experienced growth comparable to the state as a whole. Reports of

the State Tax Commission of Arizona for the fiscal years 1950-1960 show that restaurant sales tax for Pinal County has not exceeded 50 thousand dollars a year, thus indicating yearly restaurant sales of less than 5 million dollars. A distribution of this amount by population indicates restaurant sales in Eloy of $289,000. Applying statewide proportions, some 22.5 percent of this amount, or $65,000, was assumed to be expenditures by highway users. (34)

Proportioning restaurant sales on the basis of Eloy's share of Pinal County population (7.8 percent) is based on the close agreement between this ratio and Eloy's share of total retail sales for the county (7.5 percent).

The other group of retail and service establishments which would normally be affected by a by-pass is the lodging group but in Eloy this business does not cater to transient trade.

Highway users expenditures at Eloy service stations in 1958 totaled $163,000, or 3.6 percent of total sales. Their expenditures at restaurants was $65,000, or 1.5 percent of total sales. Thus $228,000 or 5.8 percent of total retail and service trade sales was obtained from through travelers. Potential sales to highway users are considered as being directly proportional to the number of vehicles passing through the Eloy area on I-10 and Arizona Highway 84. These potential sales can be realized by Eloy business if efforts are made to relocate close to the one interchange serving the city. It was assumed for this study that relocation would be effected to obtain 50 percent of the potential sales to highway users. Projected potential sales to highway users was then obtained by applying the projected increase factors for through traffic volumes on Arizona 84 and Interstate 10. In order to use the 1958 highway users expenditures of $228,000 for projection purposes it was assumed that it represented potential sales as

well as actual sales. Increase factors, potential sales, and projected sales to highway users are presented in Table XVIII.

TABLE XVIII

ACTUAL AND POTENTIAL RESTAURANT AND GASOLINE SALES TO HIGHWAY USERS

Year	Through ADT*	ADT Increase Factor	Potential Dollar Sales	Actual Dollar Sales
1958	5,500	-	228,000	228,000
1960	6,500	1.18	269,000	269,000
1965	7,800	1.20	322,800	161,400
1970	10,100	1.29	416,400	230,700
1980	14,300	1.42	591,300	295,600

* Through ADT found to be approximately 92 percent of total ADT - Arizona Highway Department, Traffic Division, 1958-1959 Survey.

Differences in population forecast would result from the number of people employed by highway oriented business. In 1958, Pinal County annual retail sales averaged a gross amount of 26,000 dollars per employee. (28) Using this relationship, the number of potential employees for highway oriented business would vary from 26 in 1965 to 43 persons in 1980, if 50 percent of the potential highway trade is obtained by Eloy merchants. This small employment potential indicates that the development of the Interstate by-pass will not significantly alter the population growth of Eloy nor materially affect sales in the community.

It is evident, from Table XVIII, that the effect of the by-pass will be to substantially reduce the dollar value of sales to highway users. Unless more than the assumed 50 percent relocation of business is effected, sales to highway users will not recover to the 1960 level until approximately 1975. This long recovery period will increase the

importance of locally oriented sales.

Locally oriented sales are related to the purchasing power of the population and to retailing attitudes. In Eloy, neither of these factors "have displayed a positive temperament. (4)

Projections of Eloy retail sales were accomplished by using the weighted average rates of change of five selected sales tax sources for Arizona and Pinal County and then applying these rates to trends for locally oriented retail sales (Table VII). The five selected sales tax sources were: restaurants, wholesale meats, contracting, wholesale feed, and retail. Total sales taxes collected beginning with fiscal year 1951 were presented in Table VI and average yearly percentage increases for the intervals 1951-1955 and 1956-1960 are presented in Table XIX.

TABLE XIX

AVERAGE YEARLY PERCENTAGE INCREASE OF SALES TAX FROM SELECTED SOURCES FOR INTERVALS 1951-1955 AND 1956-1960

	Pinal County Intervals		Arizona Intervals	
	51-55	56-60	51-55	56-60
Restaurants	+ 3.41	+ 0.36	+ 4.94	+ 8.46
Whlse Meats	- 8.92	+ 18.98	- 1.21	+ 16.88
Contracting	+ 72.08	- 13.18	+ 24.49	+ 13.93
Whlse Feed	+ 12.67	+ 26.71	+ 4.97	+ 2.59
Retail	+ 5.42	+ 1.59	+ 5.33	+ 8.77

Contracting, as a source of sales tax, was not utilized to determine rates of increase because large contracts in Pinal County for Public Service Company of Arizona distort the trends (Figure 4.3). Although the rates of increase for Pinal County appear to be consistent with state rates, the average rate of change for the period 1956-1960,

is heavily weighted by additional tax collections resulting from substantial additions to livestock feeding lots. Without this additional revenue, Pinal County would have registered an approximate 7 percent per year rate of increase for this 5-year period for sales taxes from restaurants, wholesale meats, and retail sales.

From Table VII, it is apparent that the increase in Pinal County of seven percent per year is higher than the increase shown from 1954 through 1958 for retail and service trade sales. Retail and service trade sales increased at the average annual rate of 4.25 percent during the 1954-1958 interval. Although Eloy total sales did not increase during the above interval, it was assumed for projection purposes, that the four percent average annual rate would apply to Eloy and that the seven percent average annual increase would apply to Pinal County. Projected Eloy sales activity were obtained by applying the yearly increase factor to expand 1958 locally oriented sales to 1960 and by applying a five-year factor of 1.22 for the four five-year intervals to 1980. Locally oriented sales for 1958 were estimated as the difference between highway expenditures of $228,000 and total sales (Table VII). Table XX shows the projected sales activity, exclusive of highway oriented sales.

TABLE XX

ELOY PROJECTED SALES ACTIVITY

Year	Increase Factor	Dollars Sales (Thous.)	Year	Increase Factor	Dollars Sales (Thous.)
1958	-	3,993	1970	1.22	6,428
1960	1.08	4,319	1980	1.22	9,128
1965	1.22	5,269			

Projected local sales activity does not reflect any relationship

between local sales and the construction of the by-pass route. In two California studies of agricultrure communities, similarly located on major highways between metropolitan areas, retail sales were unaffected by by-pass routes. (13, 14)

5.5 Parking Projection

Parking facilities in the Central Business District, as in most small cities (35) are, at the present time, more than adequate for the demand (Table XI). The average length of time parked for all purposes (Table XII) was approximately equal to the averages accepted for shopping, business, sales, and service. (35)

During the two-hour parking study of the 201 street parking spaces in Eloy, it was observed that the peak period of usage for the unlimited parking was from 3:45 P. M. to 4:00 P. M. and peak periods for the one-hour zones were 2:45 P. M. to 3:30 P. M. Accumulation of parkers was greatest at 4:00 P. M., when less than one-half of the parking spaces were filled.

Projection of parking demand to the design year was accomplished using 1962 space hour supply and space hour usage as the base to be expanded in proportion to the projected population growth. From Figure 5. 1, the 1962 population was estimated at 5, 200 and the 1980 population has been estimated at 8, 650. This increase over 1960 may be represented by an increase factor of 1. 66 for the purpose of projecting parking demand. Table XXI presents the pertinent data and the projection of parking demand to the design year for the 2:00 P. M. to 4:00 P. M. period.

The 1980 space hour usage is less than 50 percent of the 1962 space hour supply indicating that the 1962 supply is more than adequate for the 1980 demand. The values obtained for parking usage, turnover,

and accumulation indicate that the removal of through traffic from the business district will have minor effect on parking demand. Existing facilities are adequate for the design year population. Removal of through traffic and re-routing to the by-pass will reduce friction and contribute to the adequacy of present parking facilities.

TABLE XXI

PARKING DEMAND - 1980

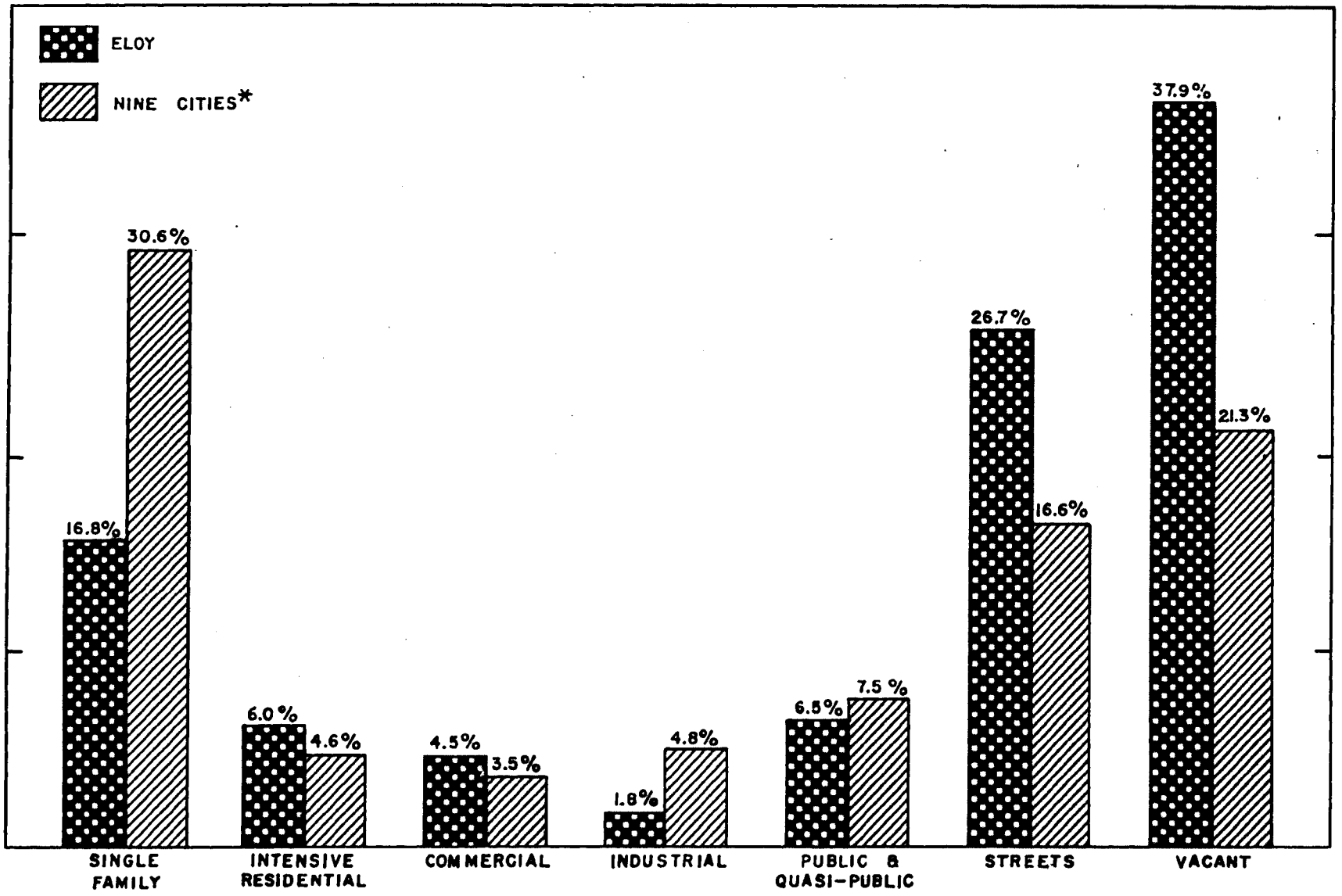
Space Hour Supply, 1962	Space Hour Usage, 1962	Increase Factor To 1980	Space Hour Usage, 1980
402	110.25	1.66	183.02

5.6 Land Use Projections

Land use for the design year was projected using the population forecast and recommended standards for land uses in satellite cities as a base. (36) The projections for different land uses were arrived at in one of two ways: (1) present land use rates for the current population combined with recommended land use rates for future additional population; or, (2) a change in the land use rate to obtain a more realistic and economical use of land. Projection of the land use rate for Single Family residence was accomplished by the first method and the land use rate for Business was resolved by the second method.

Figure 5.3 compares 1960 Land Use in Eloy to "Nine Cities" (36) as a guide to adjustments required in Land Use by 1980. A 1980 General Land Use Plan, utilizing the developed relationships, is displayed in Figure 5.4.

The present and projected land use, and the standards are given in Table XXII.



* "LAND USES IN AMERICAN CITIES" (36)

ELOY—1960

DISTRIBUTION OF LAND USE

FIGURE 5.3

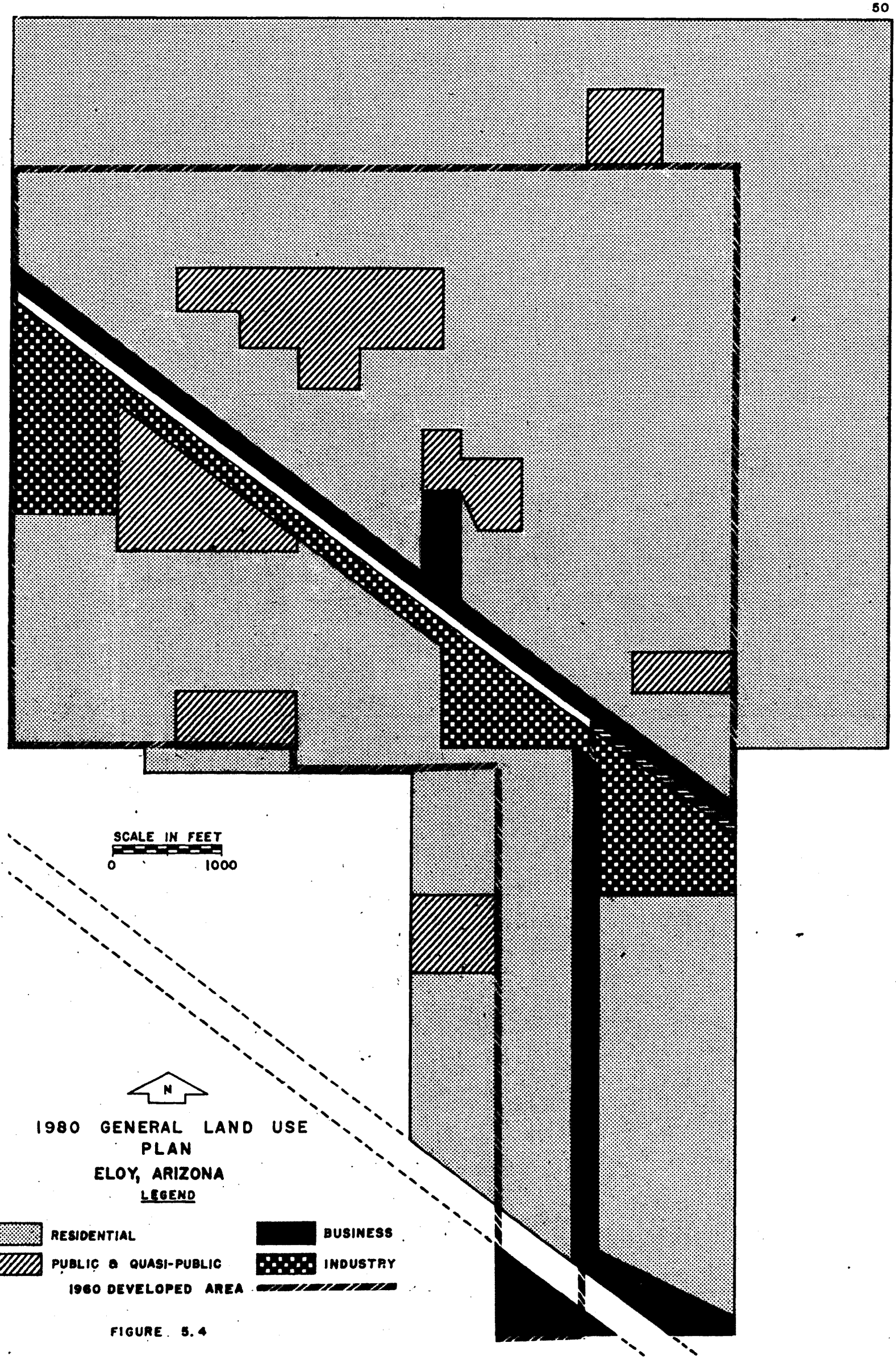

SCALE IN FEET
0
1000
N
1980 GENERAL LAND USE PLAN
ELOY, ARIZONA
LEGEND
RESIDENTIAL
BUSINESS
PUBLIC & QUASI-PUBLIC
INDUSTRY
1960 DEVELOPED AREA

FIGURE 5.4

TABLE XXII

ELOY LAND USE - 1960 AND 1980

Use	1960 Land Use In Acres	Acres per 100 Persons: Present Rate	Recommended Rate*	Projected Rate	1980 Land Use Requirements Acres
Single Family	147.6	3.02	7.62	4.95	422
Intensive Residential	51.6	1.05	0.42	0.52	44
Public and Quasi-Public	56.9	1.16	1.39	1.25	118
Business	39.6	0.81	0.31	0.31	26
Industrial	15.5	0.32	1.35	1.00	85
Streets	233.7	4.85	7.11	6.04	483
Vacant	331.8	6.78	-	4.50	382
Total	876.7				1,560

* "Land Use In America Cities" (36)

These projections of land use require conversion of some uses and the addition of 683.3 acres. The additional acres of land required for the design year population were calculated as the difference between the 1960 acreage and the projected 1980 acreage. Table XXIII shows the distribution of both the 1960 acreage and the projected 1980 acreage based on developed land and on total city area. As an example, the 422 acres of projected Single Family use required 27.0 percent of the city area and 35.8 percent of the developed land. The total acreage was distributed as follows:

TABLE XXIII

DISTRIBUTION OF LAND USE 1960 AND 1980

	Percent of City Area		Percent Of Developed Land	
Use	1960	1980	1960	1980
Single Family	16.83	27.0	27.1	35.8
Intensive Residential	5.88	2.8	9.5	3.8
Public and Quasi-Public	6.50	7.6	10.5	10.0
Commercial	4.51	1.7	7.3	2.2
Industrial	1.77	5.5	2.8	7.2
Streets	26.66	31.0	42.8	41.0
Vacant	37.85	24.4	-	-
Total	100.00	100.0	100.0	100.0

The projection of land use is directly related to the effect that the by-pass route will have on the population projection and distribution and on land use distribution. Demand for business land use at the interchange has been considered in arriving at the distribution of projected land use acreage. The distribution of other land uses was not changed as a result of the by-pass because of the small impact anticipated.

5.7 Land Value Projections

Projection of land value was based on past sales records for a location along the proposed route and for a control area. The control area was the Venza Homes subdivision and Suburban Unit No. 2 was selected as the location along the proposed route. Because of the relatively few sales in any one subdivision, it was necessary to con-

sider the entire developed area as being a sub-control area so that sufficient data could be obtained to form a statistical base for estimating true sales value from tax stamp value. The justification for using tax stamps as an indication of sale price is presented in Appendix B..

Property values in Eloy have been increasing at an average rate of 2.48 percent per year for the period 1951-1962. Figure 4.2 shows the average annual rates of increase in property value for each area of Eloy as reflected by increased sales value. The calculations necessary to obtain average annual rates of increase in property value for each area of Eloy and for the city are presented in Appendix C.. In the control area, the yearly increase was 3.81 percent and in the by-pass area, where the increase was 12.51 percent per year, no increase in value was noted until after the Interstate location was announced. The average yearly increase in value for the by-pass area does not present a true picture of the effect of the by-pass on land value. Immediately after the location details of the Interstate route were announced, property values in the by-pass area increased approximately 138 percent; this increase resulted in an average yearly increase of 12.51 percent for the 1951-1962 period. The increase in the by-pass area was consistent with increases of up to 200 percent before construction of a by-pass noted in other studies. (2, 12, 18)

The by-pass area shows the effect of development without adequate zoning control and, in 1960, a conglomeration of land use was evident. This undesirable mixture of land uses has been reflected in depressed land values. Therefore, although the value of this land has risen faster than in the control area, the value of the land per acre is still below that of the control area. Control area property has experienced a more orderly development resulting in a gradual increase in property value (Figure 4.2).

Chapter 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

A study of the projections for land use, land value, population, retail sales, parking, and traffic volumes indicate that Eloy's position is declining when compared to Pinal County and Arizona projections for these same factors. It is predicted that the trends in these factors will be practically unaltered by the construction of the by-pass.

Land use will change only in the area of the interchange and along the penetration route, involving less than two percent of the area. Land value has already increased more than 130 percent in the by-pass area and will continue to increase until the by-pass is constructed. At that time the total increase will be approximately 200 percent. As in other agriculturally oriented communities, land values will continue the past trends of annually increasing two to six percent depending on location. (23) The absence of industrial demand for land will continue to act as a depressant on land value (Table XXIII).

Total retail sales will sustain a five percent loss of gross and service stations will absorb an 18 percent reduction in business unless relocations are effected. Relocation will not only be attractive to highway oriented business but also to locally oriented business. The penetration route will create new business locations and attract businesses attempting to obtain first-exposure locations for traffic as it enters the city from the interchange.

Traffic on Arizona 84, through the business district, will be substantially reduced when the by-pass is opened, and will not increase

to the present volume by the design year. Volumes of 3,600 ADT are to be expected after the by-pass is constructed and this will increase to 6,200 by 1980 unless relocation of highway oriented business is accomplished and then Arizona 84 traffic volume will approach 4,550 ADT. Parking facilities will not require any additions to meet the demands of the population.

Eloy's economic base is not presently dependent on highway users expenditures nor will it become dependent or materially affected by the Interstate route in the future. As an agricultural community, Eloy will continue to rely on this activity to support its population. Population growth and distribution will not be significantly affected by the by-pass.

In general, Eloy's future welfare will be controlled, not by the by-pass, but by the degree of success achieved in recovering from technological advancements. The accuracy of the projections for the dependent variables will be greatly affected by any change in community spirit. Concerted drive for industrial development could increase the demand for industrial land and the presence of the by-pass would materially influence the location.

6.2 Recommendations For Future Study

Primarily, additional study will be required after the by-pass is constructed to determine, for this community, how accurate the predictions were for the variables studied. As a part of additional study, the effects of the location of the Eloy interchange should be compared with the effects which a pair of interchanges would have produced in the study variables. Also, a study of a highway oriented community would reveal trends and effects much different than may be expected in Eloy. Projections and conclusions are, by nature, a disputable topic and, to be effective, should be subjected to review and revision.

APPENDIX A

PARKING USAGE RECORD

TABLE XXIV

PARKING USAGE RECORD

Date: 4-15-61
Tabulator: M. Harmon
City: Eloy, Arizona

Type of Parking: Parallel
Block 9 Street Ariz. 84
From "D" St. To 3rd
Side: N. Ex E. ___ W. ___ S. ___

Tour at:	2:00	2:15	2:30	2:45	3:00	3:15	3:30	3:45
Block 9	627	-	-	725	228	403	155	-
	183	2,048	2,048	603	603	-	564	346
	025	025	025	025	025	025	025	-
	862	862	-	249	-	-	-	-
	539	-	889	-	-	-	-	-
	514	514	4,142	4,142	4,142	-	176	176
	937	692	-	692	692	-	278	-
	346	-	-	-	-	-	-	-
	6,782	238	672	672	672	672	733	501
	255	-	-	-	-	-	702	702
	-	556	556	556	-	-	-	-
	324	324	324	324	782	-	-	-
	441	-	-	083	-	528	-	-
	3,225	-	123	123	-	597	-	-
	895	895	-	-	441	-	-	-
	-	-	728	728	728	728	477	321
	150	150	-	-	-	086	-	-
	620	620	-	-	226	-	-	-
	-	-	515	-	389	-	-	-
	-	-	-	473	166	542	-	-
	-	471	626	-	914	914	2,727	-
	-	-	-	513	403	222	222	222
Total	16	12	11	14	14	10	10	6
Ins								
Outs								
Accumulation								
Vacant								

TABLE XXV

PARKING USAGE RECORD

Date: 4-15-61
Tabulator: M. Harmon
City: Eloy, Arizona

Type of Parking: Parallel
Block 10 Street Ariz. 84
From Stuart To "D" St.
Side: NE x E. ___ W. ___ S. ___

Tour at:	2:00	2:15	2:30	2:45	3:00	3:15	3:30	3:45
Block 10	232	232	232	232	232	232	232	232
	-	-	-	337	-	-	108	-
	-	-	8, 219	-	-	072	-	-
	-	-	-	-	866	866	-	665
	614	614	614	614	614	614	-	747
	489	701	497	497	302	-	702	-
	922	922	-	-	451	-	-	-
	-	114	114	114	-	-	-	-
Total	4	5	5	5	5	4	3	3
Ins	20	7	9	8	11	7	19	5
Outs	-	10	10	5	11	12	10	9
Accumulation	20	17	16	19	19	14	13	19
Vacant	24	27	28	25	25	30	31	35

TABLE XXVI

PARKING USAGE RECORD

Date: 4-15-61
Tabulator: M. Harmon
City: Eloy, Arizona

Type of Parking: Angle
Block 3,4,5,6 Street Main
From 5th To 7th
Side: N.___ E. x W. x S.___

Tour at:	2:00	2:15	2:30	2:45	3:00	3:15	3:30	3:45
Block 3	0	0	0	0	0	0	0	0
Block 4	0	0	0	0	0	0	0	0
Block 5	-	-	371	371	976	976	976	976
	-	-	829	829	327	327	327	327
	-	-	-	-	254	254	254	288
	-	-	-	-	776	-	805	-
Total	0	0	2	2	4	3	4	3
Block 6	988	988	988	988	988	988	988	986
	851	851	986	986	986	986	986	-
	567	567	-	-	-	-	-	727
	461	461	461	461	461	461	461	461
	986	986	-	-	-	-	-	988
	-	-	-	-	-	132	132	132
	-	-	-	-	-	-	-	126
	-	-	-	-	-	-	-	253
Total	5	5	3	3	3	4	4	7
Ins								
Outs								
Accumulation								
Vacant								

TABLE XXVI (con't)

PARKING USAGE RECORD

Date: 4-15-61
Tabulator: M. Harmon
City: Eloy, Arizona

Type of Parking: Angle
Block 7 and 8 Street Main
From 5th To 3rd
Side: N.___ E.___ W. x S.___

Tour at:	2:00	2:15	2:30	2:45	3:00	3:15	3:30	3:45
Block 7	669	669	963	963	449	449	449	449
	572	572	572	572	572	572	572	938
	415	415	415	415	6,044	6,044	6,044	524
	516	949	949	949	803	415	415	415
	524	524	620	-	524	597	597	749
	579	2,722	2,722	-	369	949	180	833
	760	-	771	771	771	771	270	769
	226	438	144	144	144	198	673	-
	598	-	-	-	606	-	324	-
	035	035	035	035	035	035	035	035
	965	965	965	965	965	965	965	965
	461	461	461	461	461	461	461	461
	249	-	872	-	043	974	-	962
	-	612	-	875	-	-	-	928
	-	-	-	9,221	-	-	-	698
Total	13	11	12	11	13	12	12	13
Block 8	017	519	519	519	519	519	519	128
	532	017	017	017	017	017	885	519
	626	5,211	5,211	5,211	5,211	5,211	6,895	6,895
	785	-	-	-	-	-	5,851	234
	6,041	-	-	-	-	-	739	739
	-	-	-	-	-	-	234	144
Total	5	3	3	3	3	3	6	6
Ins	42	7	9	6	21	10	18	24
Outs	-	14	8	6	18	13	12	20
Accumulation	42	35	36	36	39	36	42	46
Vacant	115	122	121	121	118	121	115	111

TABLE XXVI (con't)

PARKING USAGE RECORD

Date: 4-15-61
Tabulator: M. Harmon
City: Eloy, Arizona

Type of Parking: Angle
Block 1 and 2 Street Main
From 3rd To 5th
Side: N.___ E. x W.___ S.___

Tour at:	2:00	2:15	2:30	2:45	3:00	3:15	3:30	3:45
Block 1	705	705	472	377	351	351	351	351
	025	-	-	684	8,414	887	-	460
	351	-	-	521	800	516	887	-
	2,351	2,351	2,351	2,351	-	6,537	-	5,515
	5,316	5,316	5,316	5,316	-	-	609	079
	682	682	682	682	682	-	205	6,537
	4,680	4,680	4,680	4,680	-	-	-	-
	105	105	105	105	105	105	105	105
	3,077	3,077	3,077	3,077	3,077	3,077	3,077	3,077
	860	-	-	-	761	761	761	761
	-	-	-	-	928	-	285	285
	-	-	-	-	-	-	917	917
Total	10	7	7	9	8	7	9	10
Block 2	800	800	800	928	2,806	2,806	2,806	2,806
	3,796	3,796	3,796	3,796	921	921	-	-
	2,806	2,806	2,806	2,806	415	415	415	067
	353	353	353	-	-	-	-	689
	255	255	255	255	255	255	255	255
	226	226	226	226	226	-	226	226
	409	409	409	409	409	409	409	409
	336	336	336	336	150	150	407	407
	846	846	846	846	017	846	750	-
Total	9	9	9	8	8	7	7	7
Ins								
Outs								
Accumulation								
Vacant								

APPENDIX B

JUSTIFICATION FOR USING TAX STAMPS AS AN INDICATOR OF SALES PRICE

APPENDIX B

JUSTIFICATION FOR USING TAX STAMPS AS AN INDICATOR OF SALES PRICE

To accomplish the necessary justification a twenty percent sample of purchasers was selected for personal interview. Each sale was assigned a sampling number and a random number table used to pick twenty-eight samples. Numbers appearing twice were eliminated and a new number selected. The value measured was variation of sale price from tax stamp price. A scale of variations numbered from one to eleven was used to indicate sales prices within plus or minus 25 percent of the sale price indicated by value of the tax stamps.

TABLE XXVII

RELATIONSHIP BETWEEN RATING NUMBER, X_i, AND THE PERCENTAGE DIFFERENCE BETWEEN SALE PRICE OF PROPERTY AS DETERMINED FROM TAX STAMPS AND FROM INTERVIEWS WITH PURCHASERS

X_i Rating Number	Percent Variation From Stamp Value	Number	Percent Variation From Stamp Value
1	- 25	7	+ 5
2	- 20	8	+ 10
3	- 15	9	+ 15
4	- 10	10	+ 20
5	- 5	11	+ 25
6	0		

The rating numbers, X_i, used to show variation of sales price from the indicated tax stamp sales price are given in Table XXVII with the corresponding deviations from tax stamp values and the analysis of the ratings is present in Table XXVIII.

TABLE XXVIII

ANALYSIS OF SAMPLE RESULTS

Observation No.	Rating - X_i	Deviation from Mean $(\bar{X} - X_i)$	$(\bar{X} - X_i)^2$
1	2	- 2.25	5.0625
2	3	- 1.25	1.5625
3	6	+ 1.75	3.0625
4	3	- 1.25	1.5625
5	7	+ 2.75	7.5625
6	5	+ 0.75	0.5625
7	3	- 1.25	1.5625
8	2	- 2.25	5.0625
9	6	+ 1.75	3.0625
10	1	- 3.25	10.5625
11	6	+ 1.75	3.0625
12	6	+ 1.75	3.0625
13	1	- 3.25	10.5625
14	7	+ 2.75	7.5625
15	1	- 3.25	10.5625
16	2	- 2.25	5.0625
17	1	- 3.25	10.5625
18	3	- 1.25	1.5625
19	7	+ 2.75	7.5625
20	6	+ 1.75	3.0625
21	7	+ 2.75	7.5625
22	5	+ 0.75	0.5625
23	8	+ 3.75	14.0625
24	8	+ 3.75	14.0625
25	4	- 0.25	0.0625
26	2	- 2.25	5.0625
27	3	- 1.25	1.5625
28	4	- 0.25	0.0625
Total	119	0.00	145.2500

The mean value of the ratings, $\bar{X}$, was 4.25. This represents an average deviation, for the twenty-eight observations, of just under 10 percent below the value indicated by tax stamps.

The sample standard deviation was used as an estimator of the population standard deviation in order to establish the range within which

the true value of ratings for all sales would lie with a probability of error of only 5 percent.

$$s^2 = \frac{(\bar{X} - X_i)^2}{n-1} = \frac{145.25}{27} = 5.3796$$

$$\sigma = s = 2.3194$$

The estimate of the standard error of the mean value of the ratings, $\bar{X}$, is calculated as follows:

$$s_{\bar{X}} = \frac{s}{\sqrt{n}} = \frac{2.3194}{5.2915} = 0.4383$$

The range within which the mean value of ratings for all sales is then calculated, utilizing Students "t":

$$\text{Range for } \bar{X} = \bar{X} \pm t_{(0.05, df)}\, s_{\bar{X}}$$

$$= 4.25 \pm 2.052\ (0.4383)$$

$$= 3.35 \text{ to } 5.15$$

In other words, the actual sale price may be expected to be 5 to 10 percent below the tax stamp price in 95 percent of all sales.

APPENDIX C

DERIVATION OF AVERAGE ANNUAL INCREASE IN PROPERTY VALUE

TABLE XXVIV

DERIVATION OF INCREASE IN PROPERTY VALUE

COTTON CITY PROPER
AND SECOND ADDITION

Property Number	Years Between Sales - No Change In Value	Years Between Sales - Change In Value	Percent Change In Sales Price From Tax Stamps
1	5	-	0.00
2	6	-	0.00
3	1	-	0.00
4	6	-	0.00
5	-	1	- 16.00
6	8	-	0.00
7	4	2	+ 18.18
8	-	3	+ 91.20
9	6	-	0.00
10	4	-	0.00
11	-	9	+ 40.00
12	8	-	0.00
13	2	8	- 40.00
14	9	-	0.00
15	-	9	+ 40.00
16	6	-	0.00
17	-	2	+ 28.55
18	4	-	0.00
19	7	3	+ 68.55
20	10	-	0.00
21	7	-	0.00
22	8	-	0.00
23	10	-	0.00
24	-	10	+ 66.66
25	7	3	+ 40.00
26	8	-	0.00
Totals	126	50	+ 314.14
Average Percentage Increase per year			+ 1.78

SECOND ADDITION

1	-	7	+ 66.66
2	7	-	0.00
3	-	6	+ 106.66
4	8	-	0.00
Totals	15	13	+ 173.32
Average Percentage Increase per year			+ 6.19

TABLE XXX

DERIVATION OF INCREASE IN PROPERTY VALUE

CONTROL AREA, BY-PASS AREA, ELOY ADDITION, AND SUBURBAN UNIT NO. 1

Property Number	Years Between Sales - No Change In Value	Years Between Sales - Change In Value	Percent Change In Sales Price From Tax Stamps
CONTROL AREA (Venza Homes)			
1	-	7	+ 28.55
2	-	7	+ 40.00
3	4	-	0.00
Totals	4	14	+ 68.55
Average Percentage Increase per year			+ 3.81
BY-PASS AREA (S. U. No. 2)			
1	-	6	+ 200.00
2	5	-	0.00
3	5	-	0.00
Totals	10	6	+ 200.00
Average Percentage Increase per year			+ 12.50
ELOY ADDITION			
1	-	8	+ 66.66
2	-	8	+ 66.66
3	8	-	0.00
4	-	6	- 12.46
5	-	6	- 28.57
6	5	-	0.00
Totals	13	28	+ 92.99
Average Percentage Increase per year			+ 2.25
SUBURBAN UNIT NO. 1			
1	6	-	0.00
2	9	-	0.00
3	5	-	0.00
Totals	20	-	0.00
Average Percentage Increase per year			0.00

TABLE XXXI

DERIVATION OF INCREASE IN PROPERTY VALUE

LOUIS ADDITIONS AND THIRD ADDITION

AND CITY OF ELOY

Property Number	Years Between Sales - No Change In Value	Years Between Sales - Change In Value	Percent Change In Sales Price From Tax Stamps
LOUIS NO. 2			
1	7	-	0.00
2	-	4	+ 66.66
Totals	7	4	+ 66.66
Average Percentage Increase per year			+ 6.06
LOUIS NO. 3			
1	10	-	0.00
Total	10	-	0.00
Average Percentage Increase per year			0.00
THIRD ADDITION			
1	3	3	+ 133.33
2	-	4	- 36.36
3	11	-	0.00
4	10	-	0.00
5	9	-	0.00
6	8	-	0.00
7	-	8	+ 18.18
8	5	1	- 44.44
9	-	6	- 19.04
Totals	46	23	+ 51.67
Average Percentage Increase per year			+ 0.75
GRAND TOTALS FOR THE CITY OF ELOY			
1	251	138	+ 966.63
Total	251	138	+ 966.63
Average Percentage Increase per year			+ 2.48

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