MOJAVE CORRIDOR STUDY

Final Report

Prepared for

Kern COG
Caltrans
Kern County

Prepared by

Barton–Aschman Associates, Inc.

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Executive Summary

MOJAVE CORRIDOR STUDY

This report details the analyses and conclusions of a corridor study that was undertaken to identify a preferred alignment alternative for SR 58 in Mojave, California. The need for the study had been identified independently in each of the transportation plans developed in 1988 by the Kern Council of Governments, Caltrans, and the California Transportation Commission. The purpose of the study was to recommend a highway project alignment that would best serve the future transportation needs within the Mojave Corridor.

Corridor Features

State Routes 14 and 58 meet in Mojave at two junctions between which the two routes coincide. At each junction the two four-lane highways converge to form a single four-lane arterial street approximately one mile in length. This street, called the Sierra Highway, also serves as the principal thoroughfare in Mojave. A single set of railroad tracks called the Lone Pine Branch, owned and operated by the Southern Pacific Transportation Company (S.P.T.C.), crosses the Sierra Highway at-grade at a location one-quarter mile south of the north SR 14/58 junction. State highway traffic is subjected to lengthy delays by the daily train interruptions on the Lone Pine Branch.

The annual average daily traffic (AADT) through Mojave is 23,000 vehicles, but volumes have exceeded 40,000 vehicles under peak-day conditions. Projections indicate that year 2020 traffic demand could reach 54,000 AADT, with peak-day demand expected to exceed 90,000 vehicles. A high proportion of the traffic on SR 58 consists of tractor-trailer trucks, and SR 14 carries a large number of recreational vehicles.

Project Objectives

On the basis of current and anticipated transportation needs within the corridor, the project is expected to accomplish the following:

- Provide additional traffic carrying capacity to SR 14 and SR 58 in order to accommodate long-term projected traffic growth.
- Eliminate train interruptions to state highway traffic.
- Provide the opportunity for commercial trucks on SR 58 to bypass downtown Mojave and avoid interference with local traffic.
- Allow for eventual upgrade to freeway standards, with potential designation as an interstate highway.
- Meet with acceptance among local residents, elected officials and public agencies.

Kern Council
of Governments

Alternative Alignments

Following a preliminary survey of the key corridor issues, a set of six alternative schemes lying east, west, and through central Mojave were established for consideration as candidate projects. As the study progressed, alternatives were added, modified, or eliminated in accordance with public sentiment and the needs of the project. An initial screening of the alternatives reduced the number to three. The remaining alternatives were evaluated on issues relating to *serviceability* and *cost* of the facility.

Recommended Alignment

In light of the project requirements and following careful consideration of the evaluation criteria, the Outer Loop Bypass (east of Mojave), with inclusion of the SR 14 bypass option, was selected as the preferred alignment. Illustrated in the accompanying figure is the location of the recommended alignment with respect to the physical features of Mojave and its environs. In addition to its ability to fulfill the serviceability requirements within the corridor, it was this alternative that met with the highest degree of acceptance among the public and with those persons responsible for the project's implementation.

Significant Factors

Study participants viewed the following factors to be of greatest significance in selection of the preferred alignment.

Minimization of Cost

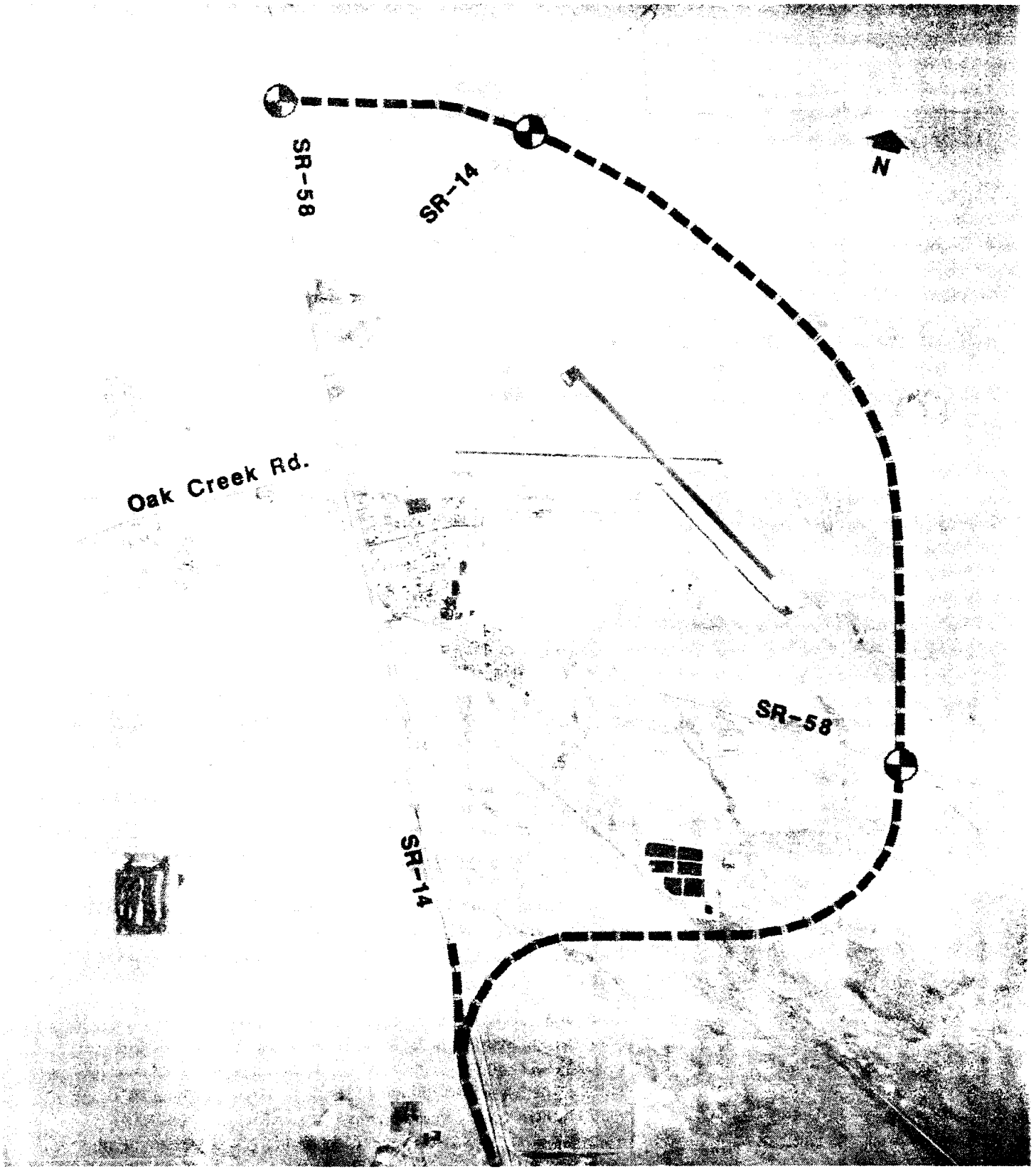
It has been estimated that $36.4 million will be required to implement all three phases of the Outer Loop Bypass. Though costly, this expenditure is $20 million less than the most economical of the other alternatives.

Project Phaseability

The potential phasing of project construction could effectively defer much of the aforementioned cost to the latter phases of construction. The initial expenditure would then be reduced to the cost associated with the bypass of State Route 58—approximately 18 million dollars.

Minimization of Project Impacts on Developments in Mojave

The alignment was devised such that no businesses or residences will need to be displaced in order to make room for the facility. Furthermore, the alignment's location east of town does not conflict with the



Approx. Scale: 1" = 3500'

= Traffic Signal

RECOMMENDED ALIGNMENT

future development of Mojave as dictated by the land use element of the Kern County General Plan.

Preservation of Support for the Mojave Economy

The phasing of the project allows for the diversion of traffic growth to the bypass while maintaining existing traffic volumes on Sierra Highway. Thus, that portion of the Mojave economy that flourishes on travelers will be maintained.

Project Phases

The preferred project would be best implemented in three phases. The three phases are described below.

Phase 1: SR 58 Bypass

The most urgently needed component of the project is a four-lane expressway extending from SR 58 north of Mojave to SR 58 east of Mojave along an alignment east of the Mojave airport. Traffic signals will be installed at the three newly formed intersections of the bypass with the two state routes, and a roadway overpass will be constructed over the Lone Pine Branch tracks.

Phase 2: Connection to SR 14

This phase entails construction of a three-mile extension of the four-lane expressway from SR 58 east of Mojave to SR 14 approximately one-mile south of Mojave. A roadway overpass will be needed at the crossing with the A.T.S.F. Railway, and a partial interchange is to be constructed at the junction of the bypass with SR 14.

Phase 3: Upgrade Existing Sierra Highway

Even with the bypass, the future volume on Sierra Highway will most likely require widening to six lanes, with a center turn lane. Improvements should also be made, as needed, to the two existing signalized intersections.

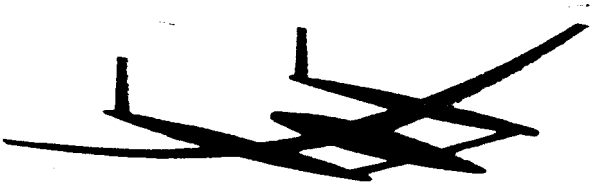
The overall project cost is dependent on the proper sequencing of the construction phases. If the Sierra Highway is widened first, the upgrade will need to include a roadway overpass at the Lone Pine Branch, which would add over $10 million to the project cost. With the total project cost having been a key factor in selection of the alignment, the recommended project phasing is important to maintain.

Table of Contents

Chapters

List of Tables

List of Figures



1.

Introduction

1.
Introduction

This report documents the analysis and conclusions of a corridor study undertaken to identify a preferred alignment alternative for SR 58 in Mojave, California. This study was conducted by Barton-Aschman Associates, Inc., transportation planning and engineering consultants, for the Kern Council of Governments (Kern COG), the California Department of Transportation (Caltrans), and the County of Kern. The location of the corridor study is illustrated on Figure 1. This chapter summarizes the background of the project, the purpose of the study, and the process by which the study was conducted.

Study Background

For many years, the Mojave Corridor has been an issue with state and local transportation officials. In 1956, the California Transportation Commission (CTC) passed a resolution establishing State Route 58 through Mojave as a freeway. It was not until 1969, however, that an alignment was adopted. Due to the lack of available funding, the project never proceeded beyond the preliminary design planning stage, and in 1977, Caltrans was considering a rescission of the approved freeway bypass of Mojave. In 1983, Caltrans and the CTC agreed to the rescission on the condi-

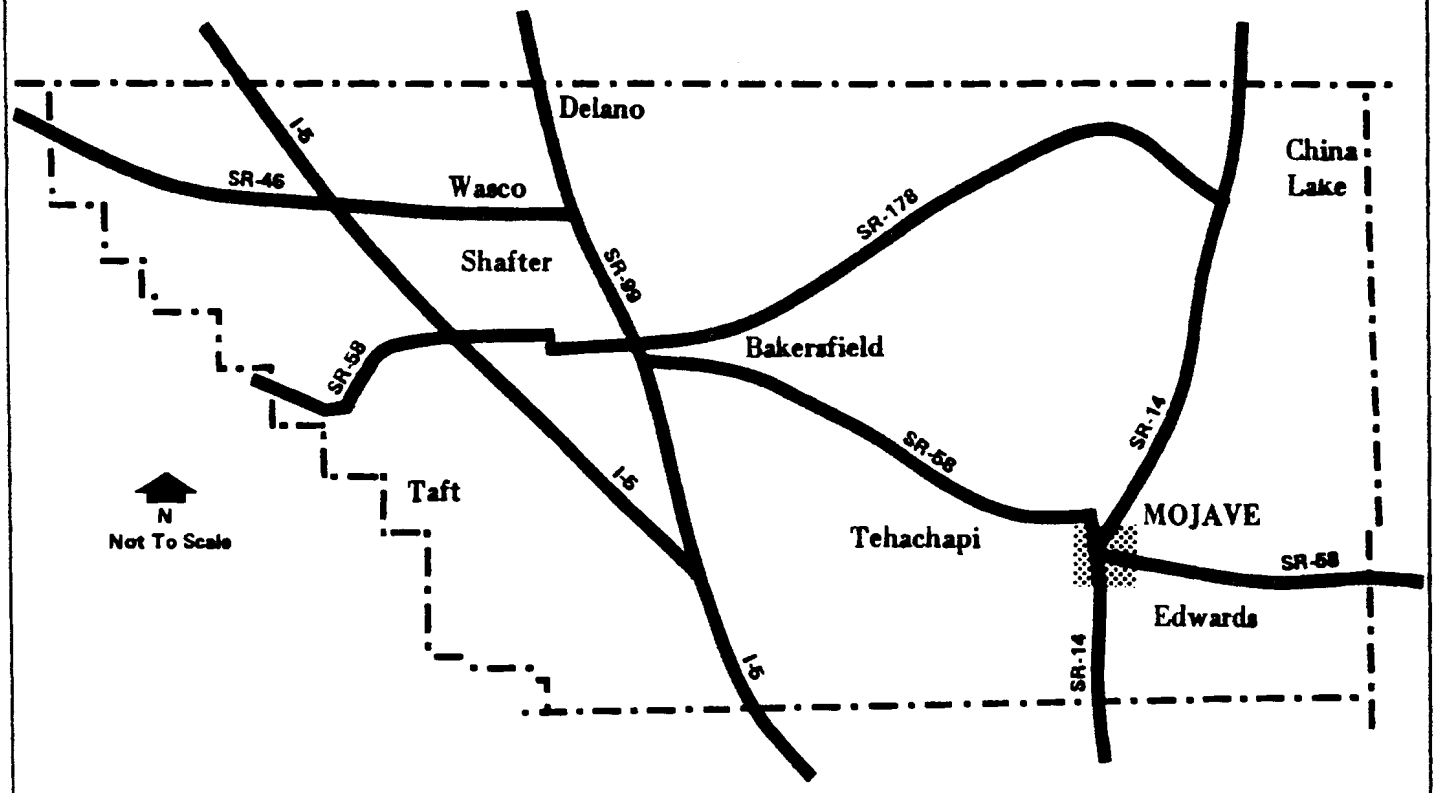


Figure-1

MOJAVE CORRIDOR LOCATION

Barton-Aschman Associates, Inc.

tion that the adopted alignment be considered as an important alternative in any future study of the Mojave Corridor. In 1988, the need for a Mojave Corridor Study was identified in the Kern COG Regional Transportation Plan, in the Caltrans Route 14 Route Concept report, and in the CTC staff recommendations for the State Transportation Improvement Program. The Kern COG *Overall Work Program* of the following year contained an approved work element to contract with consultants for the corridor study.

Study Purpose

New highways and upgrades of existing facilities require major capital investments and often decades of design, right-of-way acquisition, and construction. Transportation planners must both recognize existing traffic problems and anticipate future ones. Consequently, the purpose of this study is to identify an alignment that will best serve the future transportation needs within the Mojave Corridor, and to develop a more workable alternative to the approved freeway bypass. Although local and regional concerns will be addressed and needs accommodated, it is primarily in recognition of the need to upgrade and modernize the state highway system that this project will be undertaken.

Since the availability of state funding for future transportation projects is always an uncertainty, it should be understood that this planing study does not imply a commitment on the part of Caltrans to provide funds or to undertake project-level environmental studies for a future transportation project. With mutual agreement by Kern COG, Caltrans, and Kern County as to the preferred alignment, the alternative will be identified as a "candidate project" and will be considered for implementation as funds become available.

Study Procedure

This study has been carried out by Barton-Aschman Associates, Inc. under the direction of a technical steering committee composed of representatives of the sponsoring agencies—Kern COG, Caltrans, and Kern County—as well as a representative from Supervisor Austin's office and California City.

The consultant's work effort began in September 1989 with a review of past work on the corridor and with discussions of key issues with the committee members. A general outline of the principal work activities undertaken thereafter is shown on Figure 2. During the study, the consultant kept the steering committee members apprised of the study's progress by means of technical memoranda and periodic (face-to-face) meetings. There has also been a high level of public involvement throughout the course of this study. To encourage public participation and ultimately ensure public acceptance, every effort was made to maintain an open dialogue with the Mojave and California City communities. Four general public meetings were held to gain input about corridor issues and problems, improvement opportunities, and evaluation of alternatives.

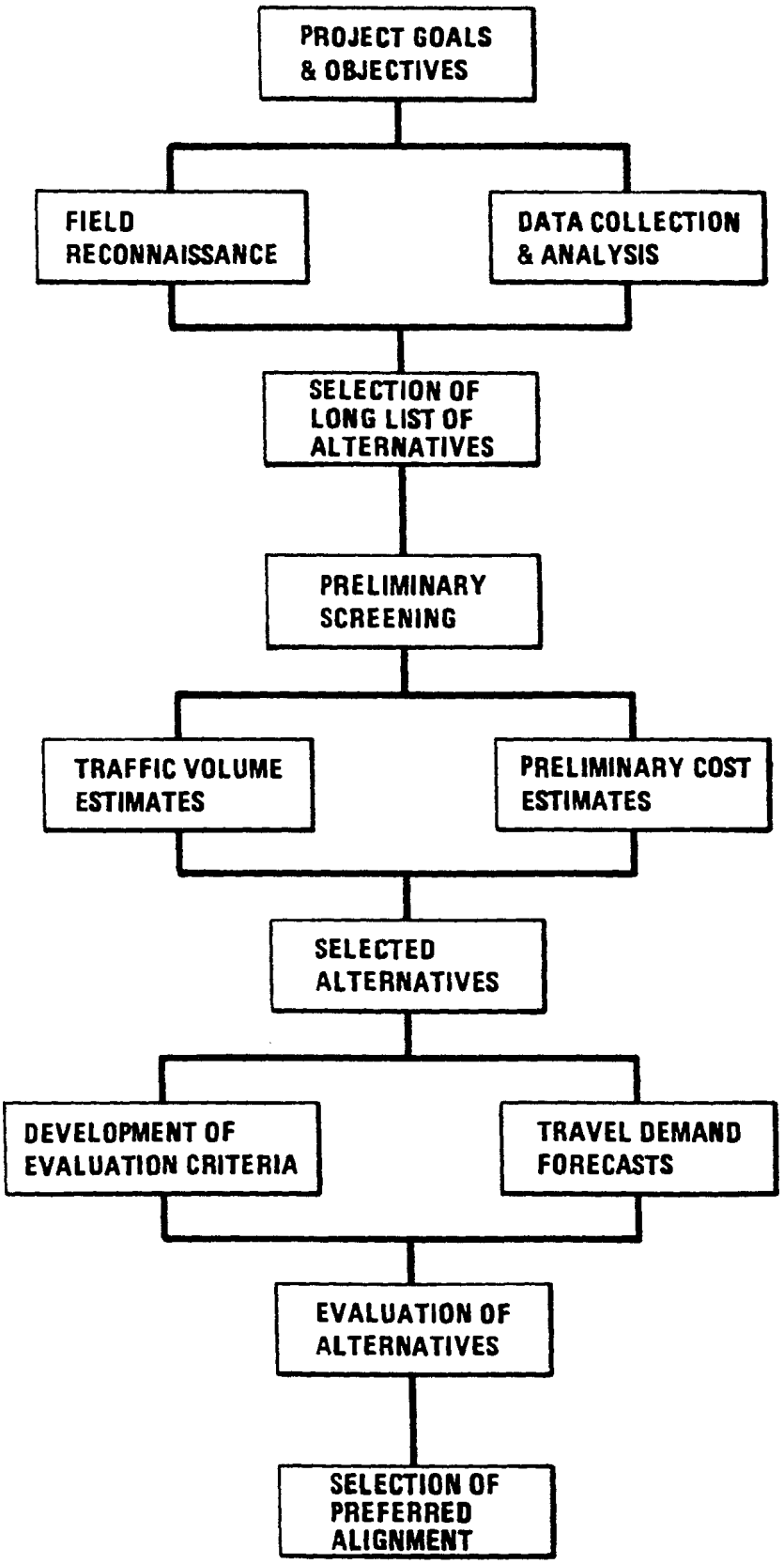
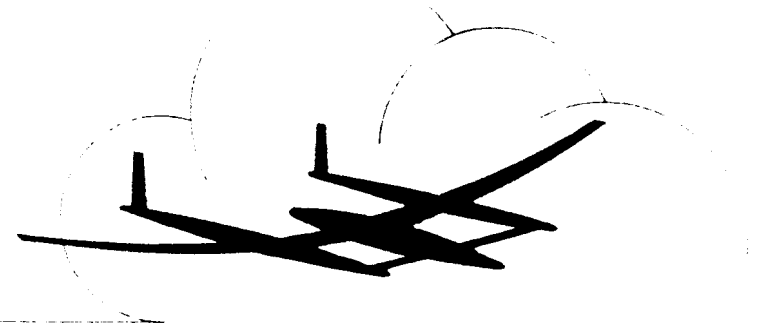


Figure-2

PROJECT WORK ACTIVITIES

Barton-Aschman Associates, Inc.



2.

Existing Conditions

2.
Existing Conditions

Provided in this chapter is a summary of the circulation network in Mojave and its significance in the California State Highway system. The nature and extent of the demands placed on the Mojave Corridor are also addressed.

Transportation System

State Route 58 is the principal east/west highway connecting Bakersfield to Interstate 15 in Barstow. It serves as the primary channel through which goods from the San Joaquin Valley are transported to Las Vegas and communities in the Mojave Desert region. Because of the commercial significance of SR 58, tractor-trailer trucks make up a large share of the total number of vehicles carried.

State Route 14 is the main highway connecting metropolitan Los Angeles to U.S. Route 395. Route 395 is the only major north/south route in California located east of the Sierras, and it provides access to numerous park and recreation facilities. A high percentage of the traffic on U.S. 395,

and thus on SR 14 as well, consists of recreation vehicles bound for the ski resorts of Mammoth Lakes.

As can be seen on Figure 3, State Routes 14 and 58 meet in Mojave at two junctions, between which the two routes coincide. Two traffic signals, one each at the north and south junctions, provide the only interruptions to otherwise free-flowing traffic on these two highways. At each junction, the two four-lane routes converge to form a single four-lane arterial street of approximately one mile in length, which serves as the principal thoroughfare (hereafter called the Sierra Highway) in Mojave.

Land Use and Local Circulation

Because it is an unincorporated area, development in Mojave has followed the land use element of the Kern County General Plan. The existing developed areas are shown on Figure 4 with corresponding land usages.

Several factors have influenced growth patterns in the region. Development immediately west of the Sierra Highway is constrained by the presence of a railroad switching yard and three north/south mainline tracks, which are owned and operated by the Southern Pacific Transportation Company (S.P.T.C.). The 112-foot-wide strip of land separating the easternmost track from the highway accommodates a few small business developments, an abandoned railroad station, and a short auxiliary track. Access to residential developments on the west side is hampered by the need for railroad crossings. The primary crossing point is Oak Creek Road, a two-lane highway that extends westward from the Sierra Highway. A single line of S.P.T.C. RR tracks (hereafter called the Trona Trolley) crosses the Sierra Highway one-quarter mile north of Oak Creek Road before joining the north/south mainline tracks. Situated approximately one-half mile east of the Sierra Highway is the Mojave Airport, which extends from Barstow Road (eastern portion of SR 58) north to the S.P. Trona Trolley RR line. Its size and its proximity to the main highway have effectively precluded any possibility of expanding Mojave eastward.

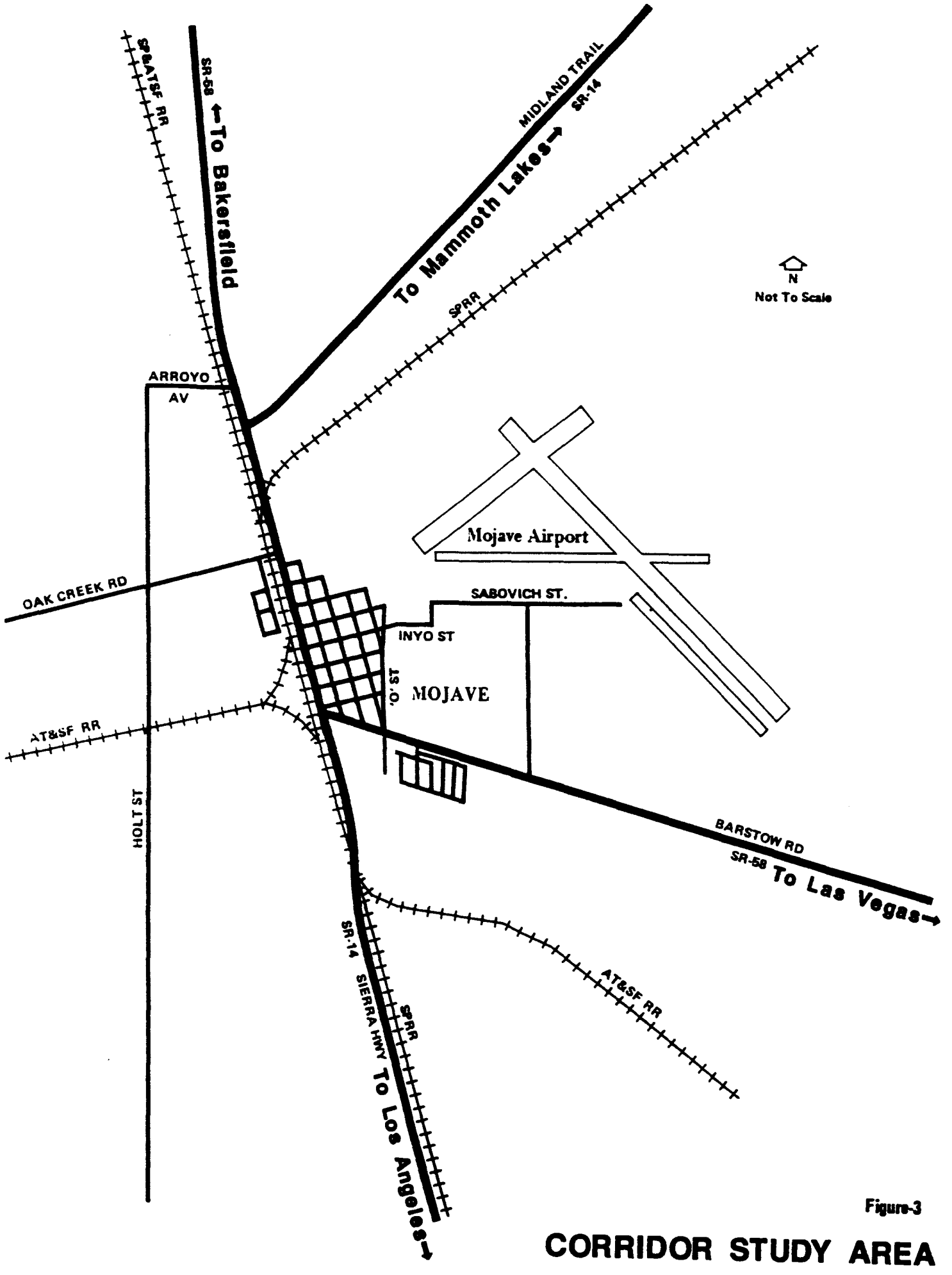


Figure-3

CORRIDOR STUDY AREA

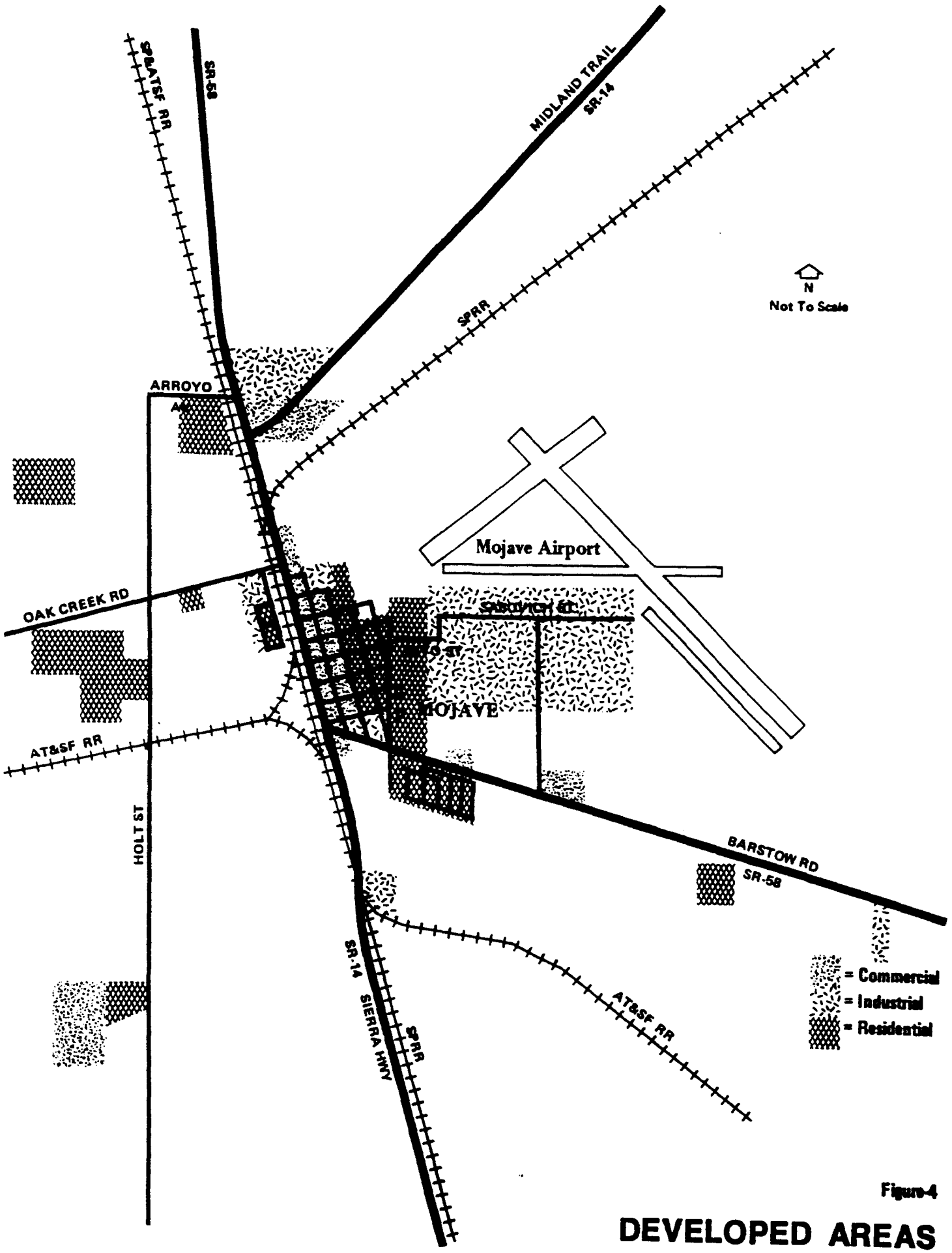


Figure-4

DEVELOPED AREAS BY LAND USE

Traffic Patterns

Having a state highway for its main street, the economy of Mojave includes the types of businesses that are supported by through traffic. The eastern edge of the Sierra Highway through town is lined with commercial establishments that cater to the needs of the traveler—diners, fast-food restaurants, gas stations, truck stops, and motels. Many of the more important retail stores are located along the Midland Trail (SR 14) in northern Mojave and are accessible to residents only by way of the Sierra Highway.

Based on the Kern COG travel demand model, and as indicated in Table 1, only 13 percent of the total traffic on the Sierra Highway is generated locally. In contrast, the through traffic--composed of those trips that do not originate, terminate, or stop in Mojave—accounts for nearly half of the vehicles using the corridor. Predictably, the majority of these through trips consists of travelers using either SR 14 or SR 58 exclusively. Other paths are not uncommon, however, as evidenced by the numbers in Table 2.

Although the average daily traffic through Mojave is approximately 23,000 vehicles (see Figure 5), traffic volumes have, with reasonable predictability, exceeded 40,000 vehicles per day during winter holiday weekends when skiers travel to the resorts in the Mammoth Lakes area. Very high traffic volumes also occur when incidents cause the blockage of I-5 and traffic is detoured through Mojave. Thus, traffic conditions on Sierra Highway are widely variable. These circumstances clearly point to a transportation system that should be analyzed on the basis of both average-day and peak-day demand.

Table 1
NATURE OF EXISTING TRIPS USING MOJAVE CORRIDOR

Component	1988 Traffic Volume (AADT)[1]	Percentage of Total (%)
Local (Internal-Internal)	3,200	14
Regional (External-Internal)	10,600	46
Through (External-External)	9,400	40
Total	23,200	100

[1] AADT = Annual average daily traffic.

Table 2
COMPOSITION OF EXISTING THROUGH TRIPS USING MOJAVE CORRIDOR

Component	1988 Volume (AADT)
	700
	3,000
	1,700
	4,600
	100
	1,300

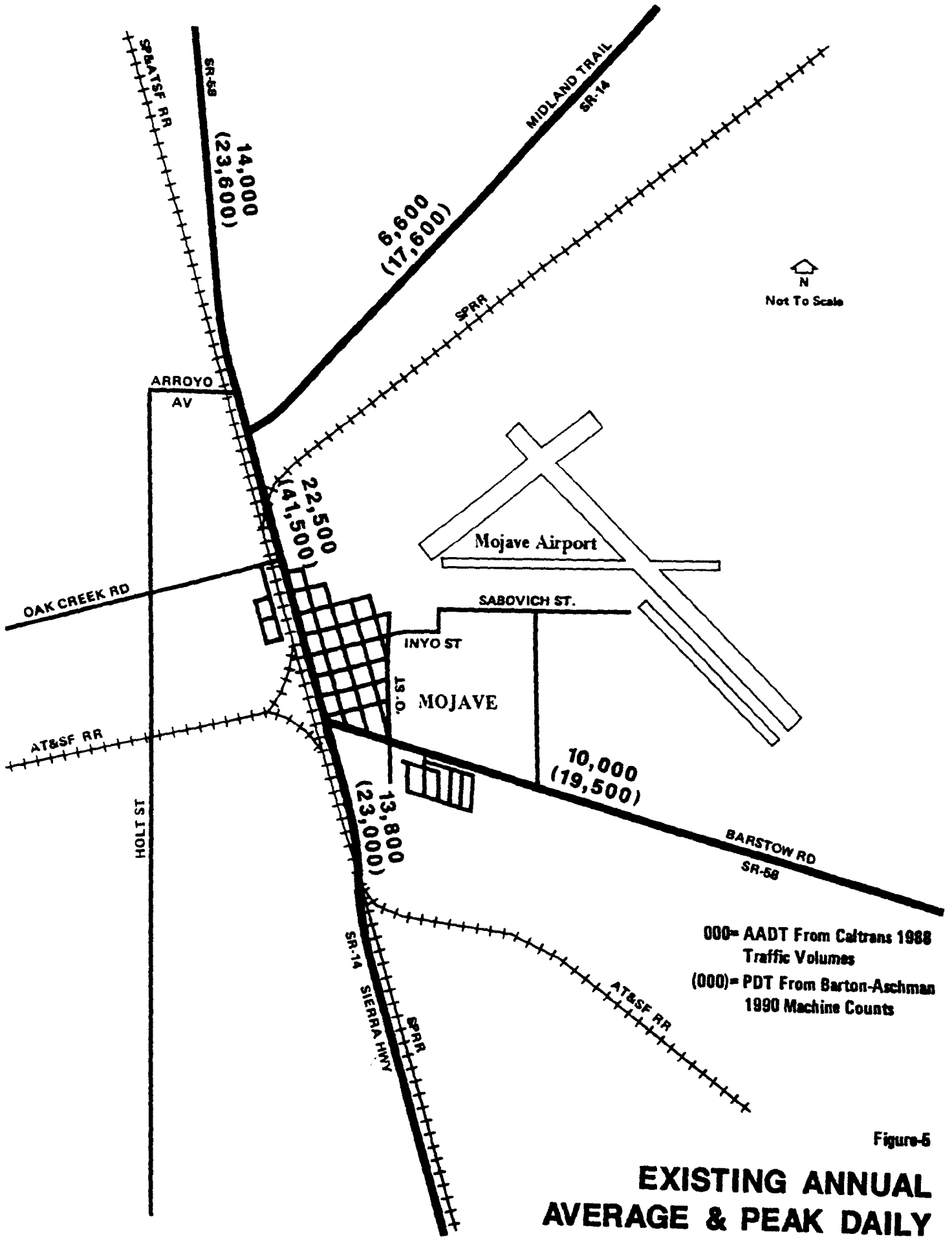
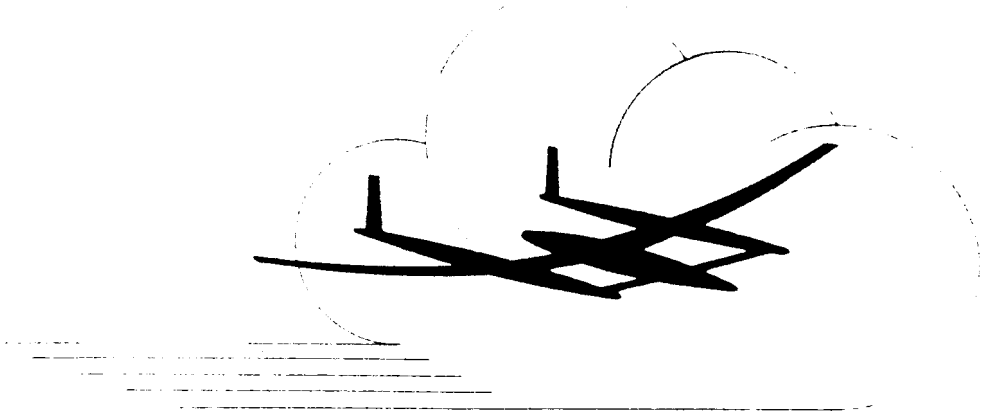


Figure-5

EXISTING ANNUAL AVERAGE & PEAK DAILY TRAFFIC VOLUMES



3.

Project Considerations

3.
Project Considerations

This chapter examines the more problematic features of the Mojave Corridor (see Figure 6), forming a basis from which to evaluate the need for, and the effectiveness of, an alternative highway alignment.

Current Issues

As mentioned previously, the high percentage of tractor-trailer trucks on SR 58 has contributed significantly to the traffic congestion in Mojave. The most recent Caltrans' data on the subject indicates that tractor-trailer trucks account for up to 30 percent of total vehicular traffic on SR 58 through Mojave. The most notable problems are created by eastbound (southbound through town) trucks that elect to stop in town. With all truck facilities located on the east side of the Sierra Highway, these trucks are required to make a left turn both into and out of the facility. From the standpoint of safety and congestion relief, a reduction in the number of these turns is desired.

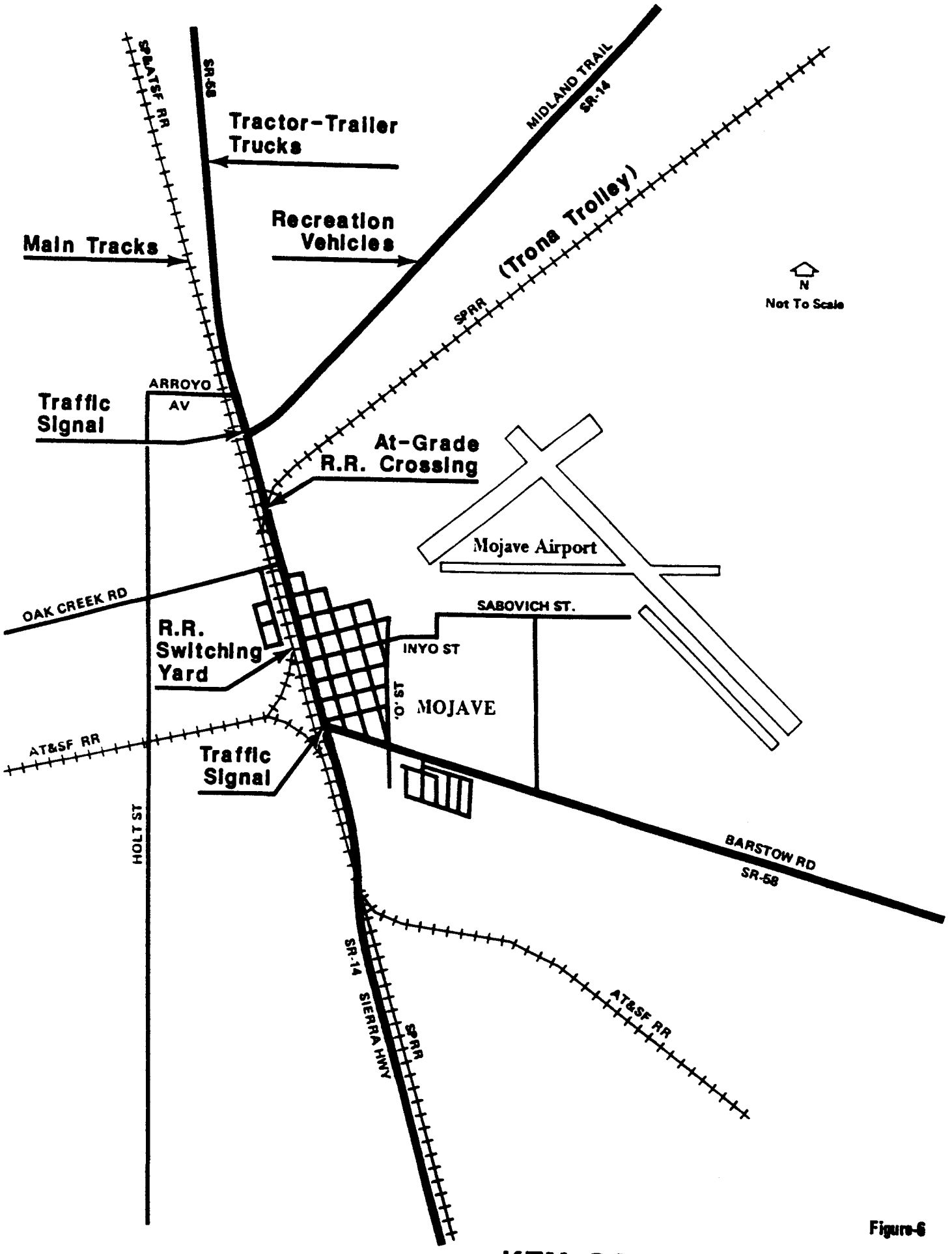


Figure-6

KEY CORRIDOR FEATURES

There are two aspects of the railroad issue requiring attention. One relates to the ongoing problem with train interruptions, and the other pertains to the spatial constraints imposed by the location of the tracks. Vehicular traffic is preempted by train traffic at two locations in Mojave. Traffic on Oak Creek Road, which is mostly local, is interrupted 30 to 40 times daily by trains on one of the three mainline tracks shared by the S.P.T.C. and the Atchison Topeka and Santa Fe Railway (A.T.S.F.R.). Although relatively short in duration, the high frequency of these interruptions is a cause of some frustration to the residents of western Mojave. In contrast, Sierra Highway traffic is obstructed by the single Trona Trolley line but twice daily, at most. However, these interruptions have been known to last as long as 15 minutes, a delay of unacceptable length on a major state highway.

The location of the mainline railroad tracks and the switching yard present the greatest obstacle to the improvement of the Mojave Corridor. The position of the tracks parallel to the main highway and adjacent to the town severely limits the extent to which the existing highway can be upgraded. Furthermore, this strip of land is not of sufficient depth to accommodate most potential commercial developments along the west side of the highway. In addition, the land use element of the Kern County General Plan dictates that nearly all future residential development occur west of the mainline tracks. The ability of Mojave to service this growth is severely hampered, however, by the presence of the railroad and the frequent train interruptions.

Future Conditions

Growth Projections

There is every indication that travel demand through the corridor will continue to increase through the year 2020. This projected traffic growth can be ascribed to anticipated population increases in Mojave as well as to projected growth in other regions known to be of significance to the corridor. These traffic growth projections, shown in Table 3, were generated by the Kern COG Travel Demand Model

Table 3
TRAFFIC GROWTH IN MOJAVE CORRIDOR

Component	Traffic Volumes[1] (ADT) 1988		2020		Traffic Growth Rate (%) Total	Annual
Local	3,200	(14%)	5,000	(9%)	56	1.4
Regional	10,600	(46%)	19,800	(34%)	87	1.9
Through	9,400	(40%)	33,300	(57%)	254	4.0
Total	23,200	(100%)	58,100	(100%)	150	2.9

[1] Based on Kern COG travel demand model.

using data provided by Kern County Planning and Development and by the California State Department of Finance.

Because of the predominance of through traffic within the corridor, which is expected to account for more than half of the total traffic by the year 2020, it was deemed prudent to check that the projected increases in through traffic were of reasonable magnitude. To facilitate this check, some simplifying assumptions were made regarding the origins and destinations of the through traffic. Metropolitan Bakersfield was taken as one terminus of the SR 58 share of the traffic, with the other terminus located in the Las Vegas Metropolitan Area. Similarly, the SR 14 portion of the traffic through Mojave was assumed to have its termini in the Los Angeles Basin and in the resort town of Mammoth Lakes. As shown in Table 4, future population estimates suggest growth rates that are in close agreement with those rates predicted by the model (i.e., one to three percent annually). Future population and employment estimates for Mojave were likewise incorporated into the Kern County Travel Demand model in representation of the local contribution to projected traffic growth.

To assist with the specification of improvement alternatives that would meet travel demand, the through traffic was separated into components (see Table 5). The important through traffic movements are:

Table 4
POPULATION GROWTH ESTIMATES FOR EXTERNAL TRIP GENERATION CENTERS

Location	Route	Population (1000)			Annual Growth Rate (%)	
		1980	1990	2010	Historic	Projected
Bakersfield	SR 58 W	228	299	381	2.7	1.2
Las Vegas	SR 58 E	165	266	500	5.3	3.0
Mammoth Lakes[1]	SR 14 N	—	23	44	—	3.2
Los Angeles	SR 14 S	12,383	13,729	18,256	2.6	1.3

[1] Maximum number of temporary residents.

- Traveling on Route 58, i.e., Bakersfield to Las Vegas;
- Traveling on Route 14, i.e., Los Angeles to Mammoth Lakes;
- Traveling on Route 58 to Route 14, i.e., Bakersfield to Lancaster.

Traffic Capacity and Levels of Service

The ability of a roadway to accommodate traffic flow is evaluated on the basis of the level of service (LOS) that it provides. The letter value associated with the LOS, as shown in Table 6, varies from A (desirable) to F (undesirable), and is used as a measure of the roadway's effectiveness in providing traffic capacity. Poor LOS values thus warrant consideration for roadway improvements.

Table 7 indicates that the four-lane divided Sierra Highway through Mojave should, at LOS C, be capable of carrying 28,000 vehicles daily. Although 1988 Caltrans data showed annual average daily traffic (AADT) volumes on the order of 22,500, traffic counts made by Caltrans over a one-week period during December 1989 indicated average daily traffic volumes of 30,000. Traffic demand on SR 14 has been observed to peak during winter holiday weekends at the

Table 5
INCREASE IN THROUGH TRAFFIC USING MOJAVE CORRIDOR

Component	Volume (AADT) 1988	Volume (AADT) 2020	Average Daily Increase
	700	1,500	800
	3,000	7,400	4,400
	1,700	10,400	8,700
	4,600	10,800	6,200
	100	200	100
	1,300	3,000	1,700

TABLE 6
LEVEL OF SERVICE DEFINITIONS FOR ROADWAYS

Level of Service	Description	V/C Ratio
A	A condition of free flow, with low volumes and high speeds. Traffic density is low, with speeds controlled by driver desire, speed limits, and physical road conditions.	Less than 0.600
B	A condition of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation.	0.600-0.699
C	A condition of stable flow, but speed and maneuverability are more adversely affected by higher traffic volumes. Most drivers are restricted in their freedom to select their own speed, change lanes, or pass.	0.700-0.799
D	Conditions approach unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuation in volume and temporary restrictions may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low, but conditions can be tolerated for short periods of time.	0.800-0.899
E	Represents operation at speeds lower than in Level D, with volumes at or near the capacity of the highway.	0.900-0.999
F	Represents forced-flow operations at low speeds, where volumes are below capacity. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion. In the extreme, both speed and volume can drop to zero.	1.000 and Greater

Table 7
SERVICE VOLUMES FOR VARIOUS ROAD TYPES

Highway Type	Total Daily Vehicles (ADT) LOS C	LOS E (Capacity)
6-Lane Freeway	90,000	112,500
4-Lane Freeway	60,000	75,000
6-Lane Divided Highway	40,000	50,000
4-Lane Expressway	36,000	45,000
4-Lane Divided Highway	28,000	35,000

height of the snow-skiing season. Traffic counts were thus also taken during President's Day weekend 1990, and the peak-day demand was found to be 43,000 vehicles—an amount far in excess of the design of capacity for a four-lane road.

Shown on Figure 7 are estimates of future (year 2020) AADT volumes in Mojave. The expected demand of 54,000 AADT greatly exceeds the capacity of the existing Sierra Highway. In fact, nothing less than a four-lane freeway (with the exception of perhaps an eight-lane divided highway) would be sufficient to accommodate such volumes. Although not shown on the figure, traffic demand is expected to exceed 90,000 vehicles in the corridor during peak days in the year 2020.

These results point to a real and present need to investigate possible improvements to the highway network in the Mojave Corridor. Because of the substantial growth expected in this region over the next few decades, it is necessary to establish a highway improvement plan that provides for adaptability to changing traffic demands. It has thus been decided that an important feature of any alignment alternative should be its degree of "upgradeability"—a measure of the ease with which the roadway can be upgraded to freeway standards.

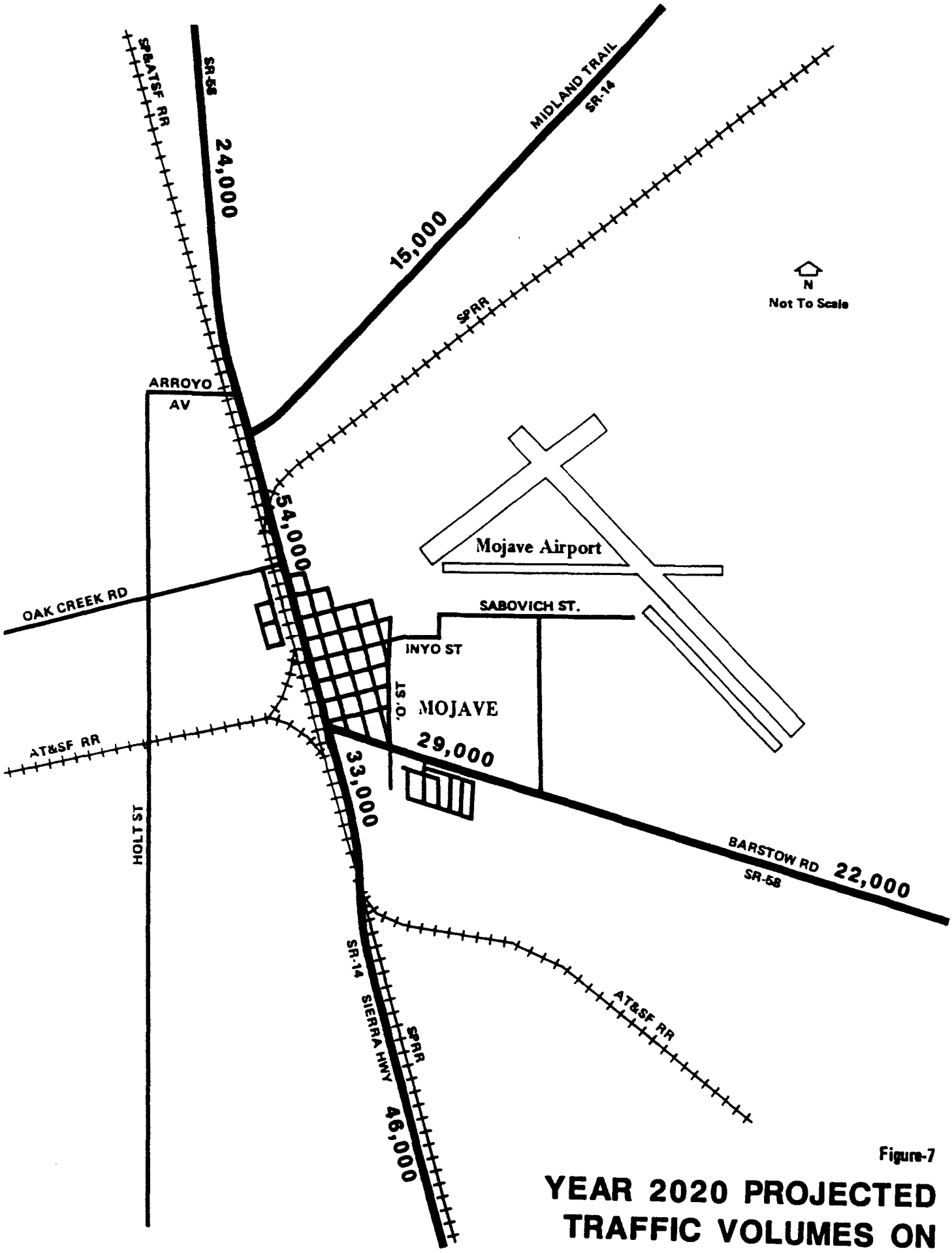
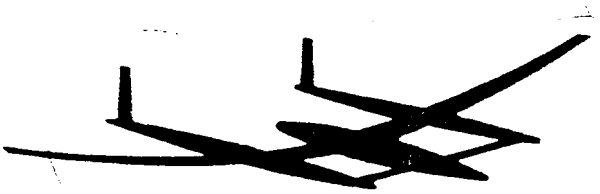


Figure-7

YEAR 2020 PROJECTED TRAFFIC VOLUMES ON THE EXISTING NETWORK



4.

Alternatives Analysis

4.
Alternatives Analysis

Having identified both current and anticipated transportation deficiencies within the Mojave Corridor, it is now appropriate to investigate the alternative schemes by which the needed improvements can be effected. Once established in sufficient detail, the various highway design alternatives will be evaluated on the basis of performance criteria that directly relate to project goals. The selection of the best alternative, and ultimately the recommendation of this report, is then based on the extent to which the particular alignment satisfies the objectives of the project.

Project Goals and Objectives

The previous chapters of this report and earlier work on this subject have indicated the Mojave Corridor project needs to accomplish the following:

- Provide additional traffic-carrying capacity to SR 14 and SR 58 in order to accommodate long-term projected traffic growth.

- Eliminate train interruptions to state highway traffic in the north/south direction.
- Provide opportunity for commercial trucks on SR 58 to bypass downtown Mojave and avoid interference with local traffic.
- Allow for eventual upgrade of a new SR 58 alignment to freeway standards, with potential designation as an interstate highway.
- Meet with acceptance among local residents, elected officials, and public agencies.

Though not explicitly stated as objectives, issues relating to project impacts on the local environment and on existing land use also have been considered, but only to the extent that fatal flaws could be detected and avoided.

The first four objectives can be translated into tangible, if not directly measurable, results. They are therefore useful in the evaluation of established alternatives. However, the ability of the project to meet with a measure of public acceptance is difficult to quantify or assess in an objective manner. The previously mentioned public meetings, the minutes of which are recorded in Appendix A, will have provided the public with the opportunity to participate in the continually evolving process of alternative selection and reformulation. The issue of public acceptance and sensitivity to local needs, though not directly tied to any particular forthcoming evaluation criterion, will then have served—along with the other objectives—to guide the course and influence the outcome of the study.

Description of Alternatives

During the first months of the study, a set of alignment alternatives was formulated by the Steering Committee members in accordance with the needs of the project. It was the intention of the committee to conduct the study with a receptivity to any and all suggestions by its members and from the public. Direct input from the public would not be

received until the first public meeting, however. The preliminary set of alternatives was as illustrated on Figure 8. Note that the initial focus of the study was directed toward the improvement of traffic conditions on SR 58, with SR 14 receiving secondary consideration.

Initial Alternatives

Following is a brief description of the physical layout and basic geometrics of each alternative.

Alternative 1: Upgrade SR 14/58 (Sierra Highway)

Widen existing highway to seven or nine lanes (including two-way left-turn lane) over the approximately one-mile stretch between the south and north junctions of SR 58 and SR 14. Also considered would be the installation of additional traffic signals at Oak Creek Road and/or Inyo Street, as well as construction of a roadway overpass at the crossing of the Trona Trolley Railroad branch line.

Alternative 2: Partial Relocation of Trona Trolley Line

Relocate nearly two and one-half miles of railroad track to an alignment located approximately one-half mile north of the northern SR 58/14 junction. Include removal of at-grade railroad crossing in town, combined with widening of existing SR 14/58. Option to construct overpass at each of two new railroad crossings would be considered.

Alternative 3: Relocation of Southern Pacific Switching Yard

Move Trona Trolley line as indicated in Alternative 2. Relocate main-line tracks of S.P.T.C. and A.T.S.F. Railway, together with switching yard, to a location approximately one-half mile west. Upgrade SR 14/58 as specified in Alternative 1, or option to construct parallel roadway facility in right-of-way vacated by railroad.

Alternative 4: Historic SR 58 Bypass (Adopted Alignment)

Construct a four-lane freeway one-half mile west of and parallel to the existing north/south alignments of SR 58 and SR 14. Include seven interchanges and four railroad overcrossings.

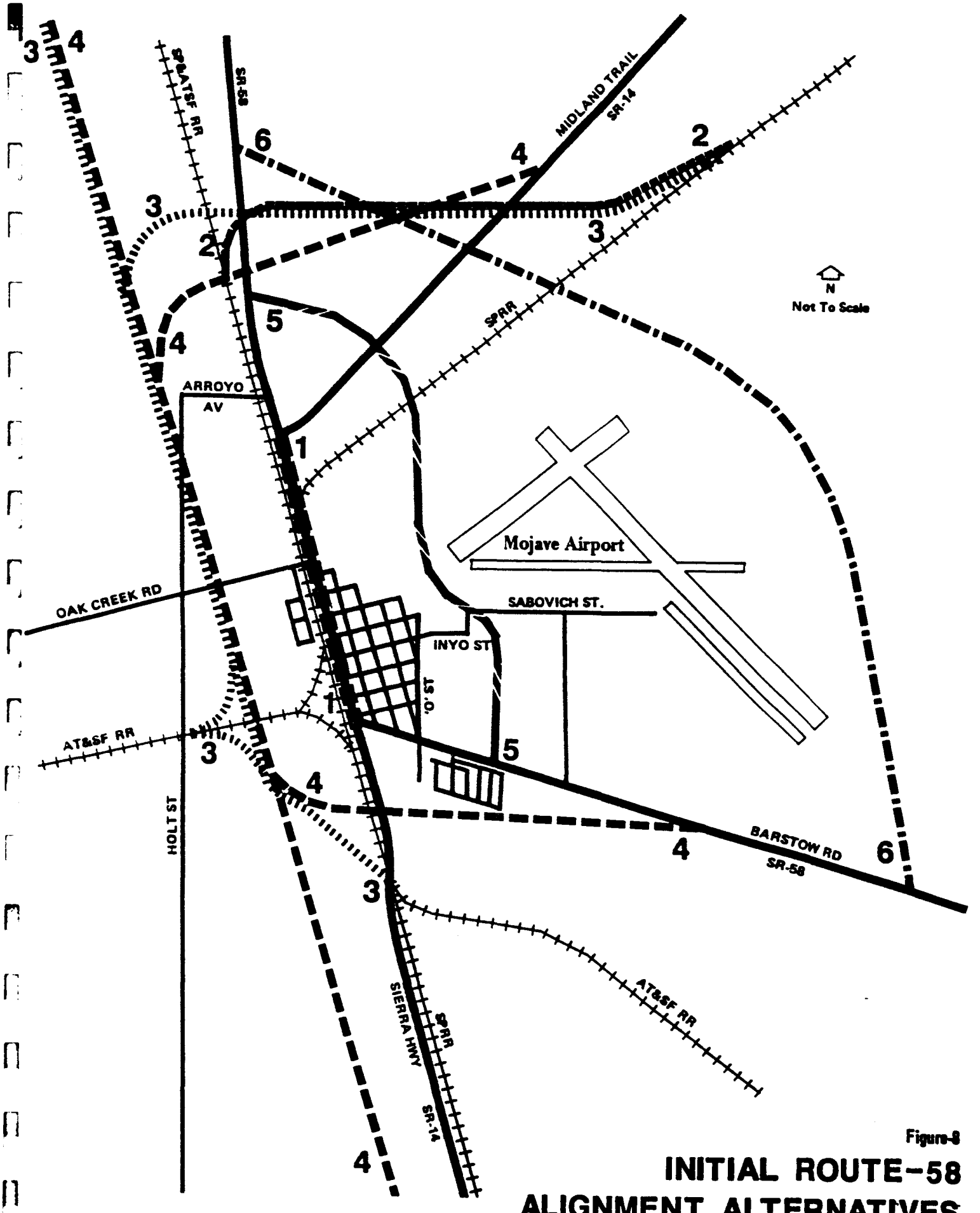


Figure-8

INITIAL ROUTE-58 ALIGNMENT ALTERNATIVES

Alternative 5: Inner Loop Bypass

Construct four-lane divided highway east of, and parallel to, O Street. Extend northern portion of alignment to intersect SR 14 and SR 58 approximately one-half mile north of the SR 58/14 junction, with adequate allowance provided for airport runway clearance to the east. Install traffic signals at the three major intersections with SR 14 and SR 58. As an option, extend facility to SR 14 at southern end of corridor and install an additional signal.

Alternative 6: Outer Loop Bypass

Construct a four-lane divided highway connecting SR 58 north of Mojave to SR 58 east of Mojave via an alignment east of the Mojave airport. Install traffic signals at each of the three major intersections with SR 14 and SR 58. Construct roadway overpass at S.P.T.C. railroad tracks north of the airport. As an option, extend facility to SR 14 at southern end of corridor and either install signal or construct interchange, as needed.

These alternatives were presented for review by local residents at the first of the Mojave public meetings. After receiving comments and criticisms relating to these and other possible alignments, there was a general feeling of satisfaction that no superior alternative solution had been overlooked.

Preliminary Screening

With a basic solution set to the Mojave Corridor problem having been formulated, the study proceeded to the iterative selection process. In order to ensure that the study would be conducted in the most expeditious and cost-effective manner, an attempt was made to reduce the number of candidate projects, primarily by disqualification on the grounds of failure to satisfy any one of the key requirements. From the project objectives, some general criteria were established for the purpose of screening the alternatives.

The results of the preliminary screening are shown in Table 8. Alternatives 2 and 3 were all but eliminated from further consideration—the former primarily because of its inability to accommodate future upgrades; the latter due to its anticipated high cost. Before abandoning these alternatives entirely, it was decided that a more thorough analysis

Table 8
MOJAVE CORRIDOR STUDY:
PRELIMINARY EVALUATION OF ALTERNATIVES

Alternative Criteria	1	2	3	4	5	6
1. Provide sufficient capacity for anticipated traffic levels.	Yes	No	Yes	Yes	Yes	Yes
2. Allow upgrade to a freeway.	Yes	No	Yes	Yes	No	Yes
3. Allow future connection to Route 14.	Yes	Yes	Yes	Yes	No	Yes
4. Minimize cost.	Yes	Yes	No	Yes	Yes	Yes

was warranted, one that would be conducted by an outside firm in parallel with the larger study so as not to delay its progress. Conducted by DeLeuw, Cather & Company, the purpose of the study was to determine the feasibility and cost of the aforementioned railroad relocations. The sub-consultant was furthermore expected to investigate the implications associated with the acquisition from the railroad of the 112-foot-strip of right-of-way adjacent to the Sierra Highway. The results of their study, which are included in Appendix B of this report, can be summarized thus:

> The track relocation portion of Alternative 3 will alone cost an estimated 20 million dollars. This expense is over and above the costs associated with even the most modest of highway improvements.
>
> The track relocation portion of Alternative 2 will cost an estimated 3 million dollars.

Acquisition of the strip of right-of-way, though estimated at a cost of approximately $7 per square foot, should meet with minimal opposition from the South Pacific Transportation Company.

Also failing to outlast the preliminary screening was Alternative 5. Because of the proximity of the alignment to residential developments and the airport, it was not possible to incorporate into its design the features (such as minimum radii of curvature, minimum right-of-way width) required to ensure its upgradeability to freeway standards.

Refinement of the Alternatives

The set of alternatives had been reduced to three, but with a refinement of the selection process came options for improvements and variations to the original schemes.

Numerous plans were tested for improving the existing alignment (Alternative 1). A six-lane highway with a 72-foot median (for barring left turns while permitting U-turns by tractor-trailer trucks) and strategically located U-turn pockets was considered as a replacement for the existing highway. However, the roadway capacity (50,000) was not sufficient to carry the expected average daily demand (54,000). On the other hand, even with the acquisition of the 112-foot-strip from the railroad, an eight-lane facility could not be accommodated within the space available. After investigating similar options in varying degrees of detail, Alternative 1 emerged in its final form—a parallel four-lane freeway facility west of, and adjacent to, the Sierra Highway.

The historic freeway bypass (Alternative 4), with a price tag in excess of $100 million, was from the outset an unacceptable solution due to the high cost. It was discovered, however, that the desired levels of mobility for the state highway traffic could be obtained much more economically. By minimizing the roadway distance and reducing the number and complexity of the interchanges, it was possible to halve the project cost. Alternative 4 thus evolved into a scaled-down version of the once-adopted four-lane freeway alignment west of Mojave.

The outer loop bypass of Mojave, as described in the original Alterative 6, has remained essentially unchanged over the course of the study. In order to augment capacity, however, the Sierra Highway widening project has been in-

cluded as part of the alternative. It will call for widening the highway to seven lanes (including a two-way left turn lane) between the two SR 14/58 junctions. In addition, the two existing signalized intersections will undergo improvements to the extent shown on Figure 9.

Evaluation of Alternatives

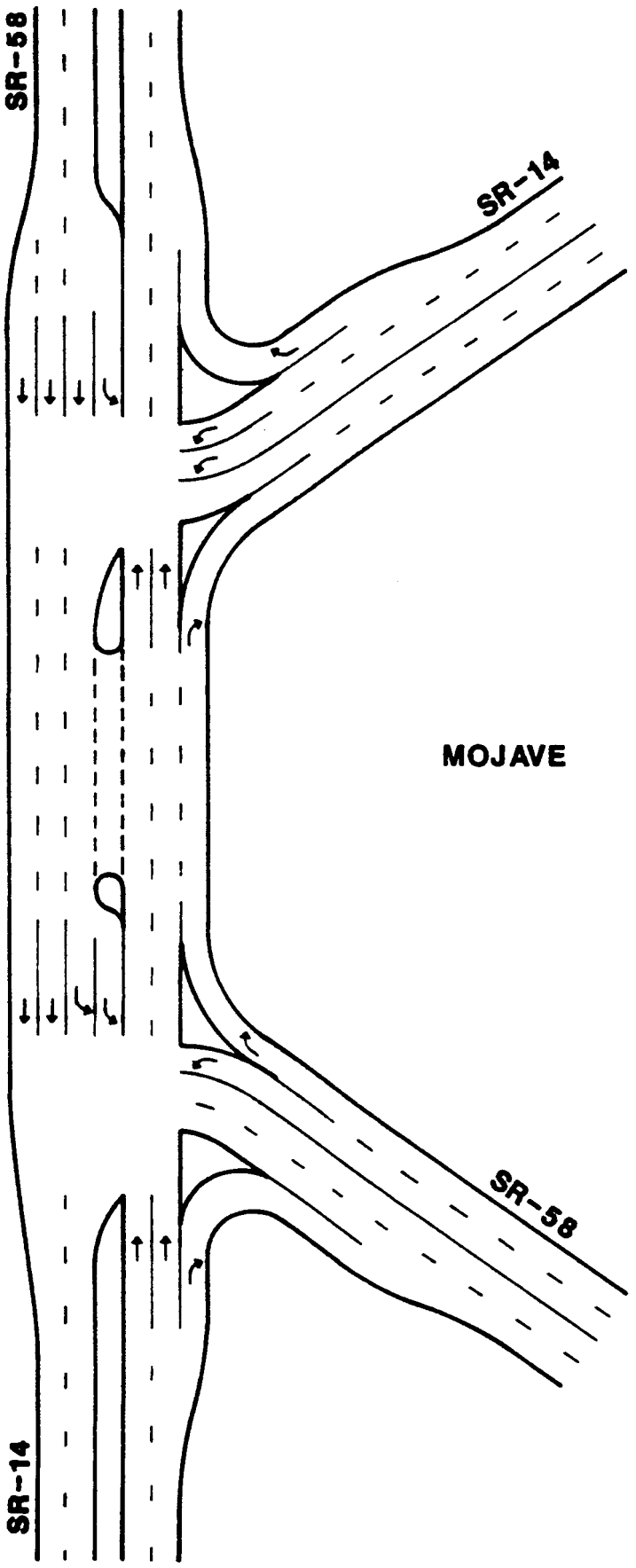
Selection of a preferred alignment is facilitated by the systematic evaluation of the alternatives on the basis of certain quantifiable performance measures against which they can be compared. These criteria are derived directly from the project goals and objectives.

Performance Criteria

Not all of the project objectives lend themselves to quantification. In fact, only *one* of the stated goals is quantifiable, that one relating to traffic capacity. Attainment of three of the goals—elimination of train interruptions, bypass provision for commercial trucks, upgradeability to freeway standards—can be determined by means of simple assessment: yes or no. By design, all of the remaining alternatives fulfill the requirements specified by these three objectives. Although it is difficult to ascertain the extent to which public acceptance will have been achieved, it will have been with the aim of accomplishing the greatest good for the greatest number of people that a recommendation was reached.

With the availability of funds as the most common limiting factor toward implementation of a project, it is a necessity that cost be included as a criterion in the evaluation of alternatives. The bases for final evaluation have therefore essentially been reduced to issues of *serviceability* and *cost* of the facility. With the intention of providing smooth operation of the roadway well into the twenty-first century, all service-related criteria have been founded on projected traffic volumes for the year 2020.

A detailed evaluation of Alternatives 1, 4, and 6 are shown in Table 9. The first six criteria all relate to traffic volumes and highway service ratios on the bypass and/or on the Sierra Highway. Criterion 7 specifies, for purposes of identification, the type of bypass proposed. Criterion 8 indicates es-



N

Not To Scale

Figure-8

RECOMMENDED INTERSECTION CONFIGURATIONS

Table 9
MOJAVE CORRIDOR STUDY:
DETAILED EVALUATION OF ALTERNATIVES

		Alternative					
		1		4		6	
		58 only	14 + 58	58 only	14 + 58	58 only	14 + 58
1.	2020 Average Daily Traffic (ADT) on bypass.	7,400	28,600	12,400	33,800	12,400	18,200
2.	2020 Peak-Day Traffic (PDT) on bypass.	12,600	59,000	17,600	64,000	26,000	42,000
3.	2020 ADT on Sierra Highway.	44,800	23,500	39,900	18,600	39,900	34,000
4.	2020 PDT on Sierra Highway.	82,000	35,000	77,000	30,000	68,000	52,000
5.	2020 average volume-to-capacityratio on Sierra Highway.	1.28	0.67	1.14	0.53	0.80	0.68
6.	2020 peak volume-to-capacity ratio on Sierra Highway.	2.33	0.99	2.19	0.85	1.36	1.04
7.	Bypass type.	Freeway	Freeway	Freeway	Freeway	Expressway	Expressway
8.	Total cost ($ millions).	47.9	80.0	44.7	55.81	9.53	6.4
9.	Cost per user.	$1.95	$0.84	$1.09	$0.50	$0.47	$0.60
10.	Possible phasing.	No	No	No	No	Yes	Yes

timated total design and construction cost for the project. Criterion 9 identifies the cost per user, a value that is obtained from the formula:

$$\text{Cost Per User} = \frac{(\text{Total Cost}) \times 11\%}{365\ (\text{Bypass AADT})}$$

Criterion 10 relates to the capability of the facility to be built in phases.

Evaluation Results

For the bypass of SR 58 *only*, projections indicate:

Low Traffic Volumes on the Bypass

Year 2020 average daily traffic volumes are projected to be low (i.e., V/C ratio is less than 0.35) for *all three* alternatives. Even under peak-day traffic conditions, the facility is seen to be similarly under-utilized. One must then conclude that the *SR 58 only* bypass option would be of limited effectiveness in attracting vehicles, regardless of the alternative selected. (See Figure 9.)

Demand Would Exceed Capacity on the Sierra Highway

Year 2020 projected average daily traffic volumes would, for all scenarios, result in low-speed, forced-flow (LOS F) traffic operations. Peak-day demand would generate V/C ratios on the order of 2.0 on the Sierra Highway for Alternatives 1 and 4. Traffic volumes are furthermore expected to exceed by nearly 40 percent the capacity of the upgraded Sierra Highway as called for in Alternative 6.

For the bypass of both SR 58 and SR 14, projections indicate:

Alternative 4 Would Divert the Greatest Number of Vehicles from the Sierra Highway

With nearly 34,000 vehicles expected to use the freeway alignment of Alternative 4, fewer than 20,000 vehicles will use the Sierra Highway under average daily conditions in

the year 2020. Even under peak conditions, the traffic volumes would be well below capacity (V/C=0.85). Note also that Alternative 1 fares well in this category (see Figures 10, 11, and 12).

Alternative 6 would carry less traffic on the bypass because it would not serve some of the through traffic demand. Even when extended to SR 14, the outer loop bypass would not capture the Bakersfield-to-Lancaster traffic (10,800 vehicles per day). Most of these vehicles would continue to use Sierra Highway because of the much shorter distance involved.

The Widened Sierra Highway Portion of Alternative 6 Would Accommodate Projected Traffic

Nearly 34,000 vehicles are expected to use the Sierra Highway under average daily conditions in the year 2020. The roadway capacity would be increased to 50,000 with the addition of two lanes as part of Alternative 6. Although peak-day traffic volumes of 52,000 vehicles are expected for the year 2020, these occurrences are infrequent and should not be cause for concern.

Alternative 6 Minimizes The Total Project Cost

Total cost of the project is expected to range from a maximum of $80 million for Alternative 1 to a minimum of $36 million for Alternative 6. Alternative 4 carries a price tag of nearly $56 million. Depending on the availability of funds for the project, Alternative 6 could represent the only feasible solution to the traffic problems within the corridor.

Alternative 4 Minimizes The Cost Per User

Because it combines the two most significant project parameters, total cost and serviceability, the cost per user is probably the best single indicator of overall project efficiency. Experience has shown that a cost exceeding one dollar per user is generally unacceptable. With Alternatives 4 and 6 having quotients near 50 cents per user, only Alternative 1 (at 84 cents per user) can be said to fare poorly in this category.

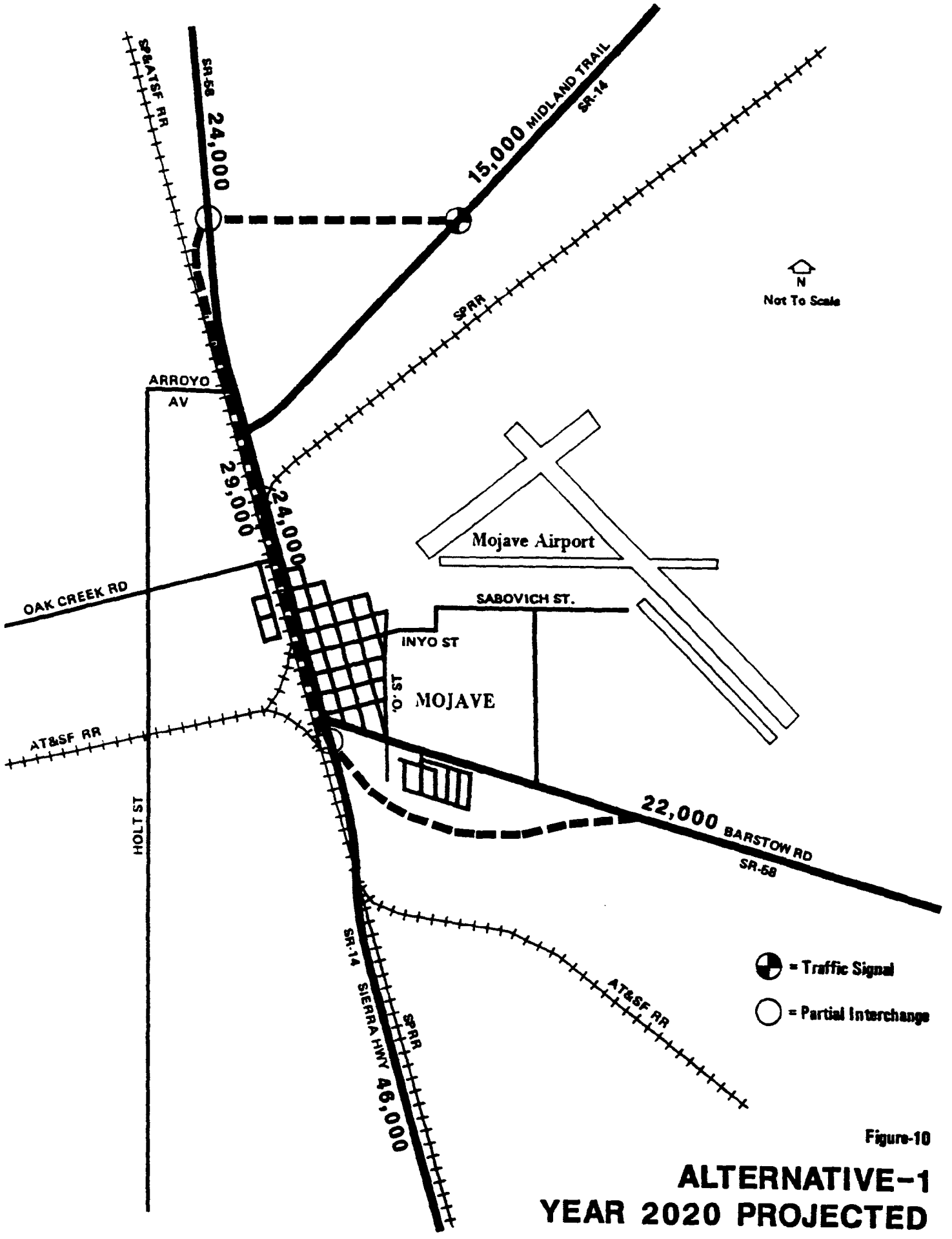


Figure-10

ALTERNATIVE-1 YEAR 2020 PROJECTED TRAFFIC VOLUMES

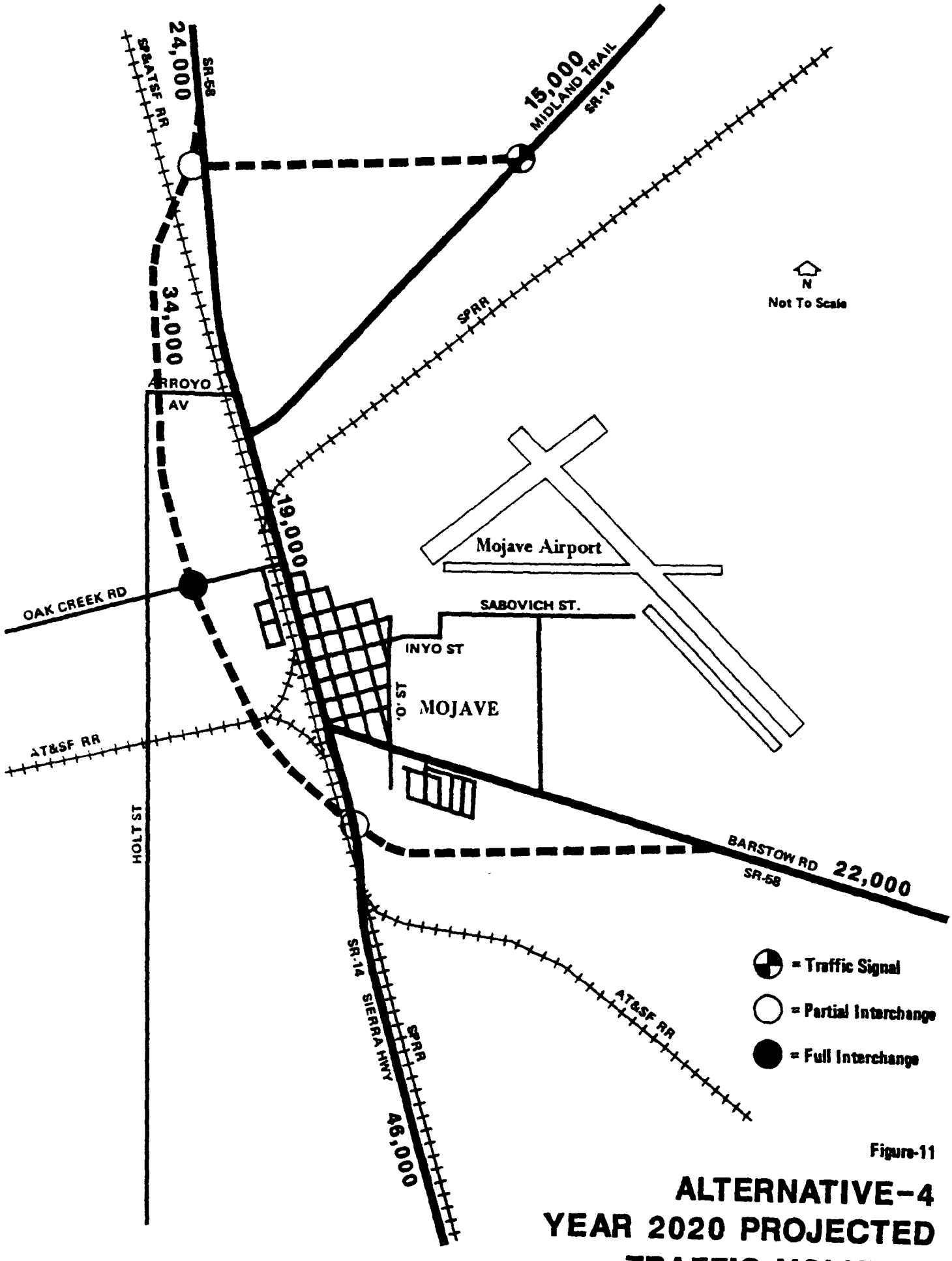


Figure-11

ALTERNATIVE-4 YEAR 2020 PROJECTED TRAFFIC VOLUMES

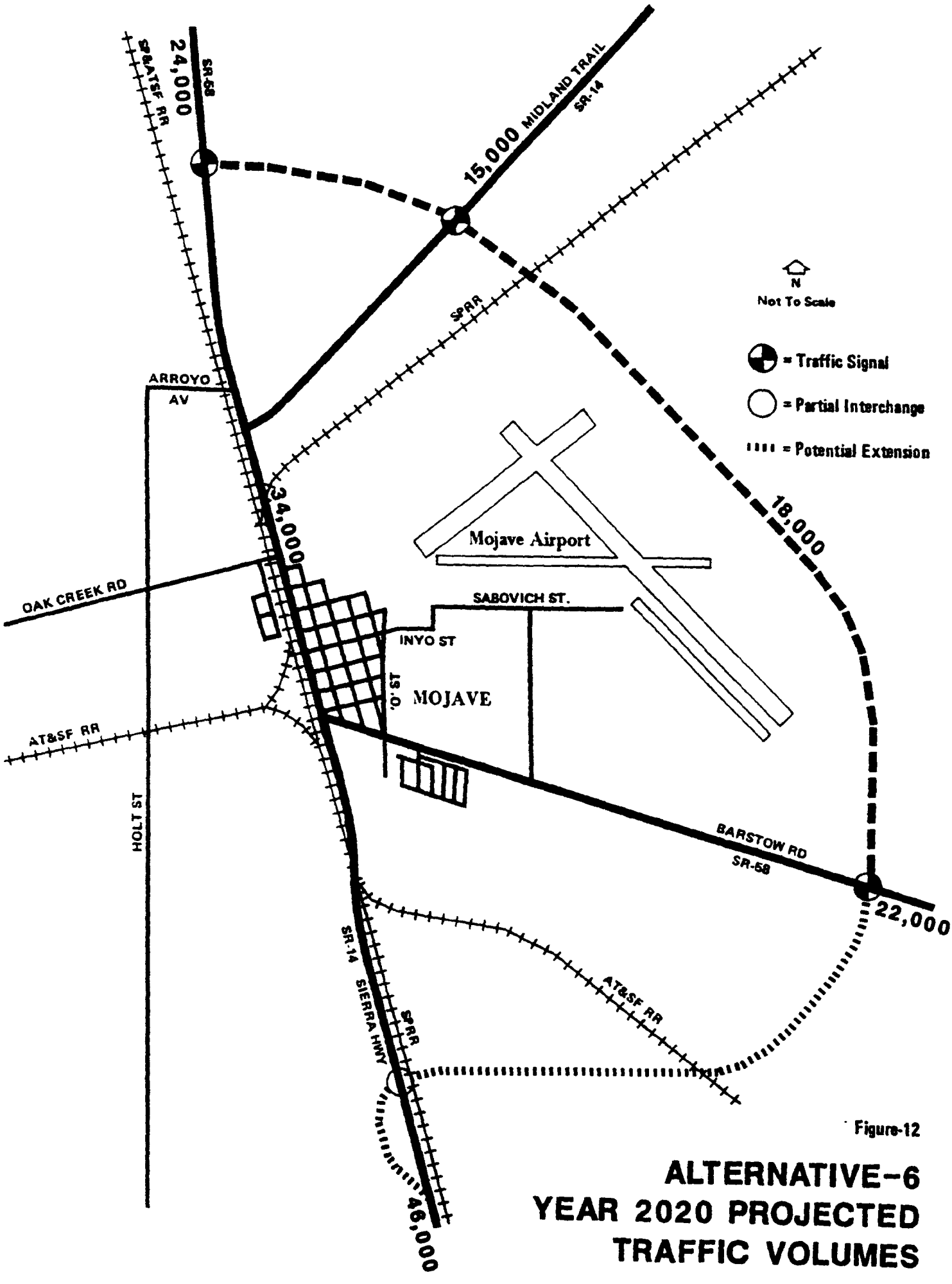
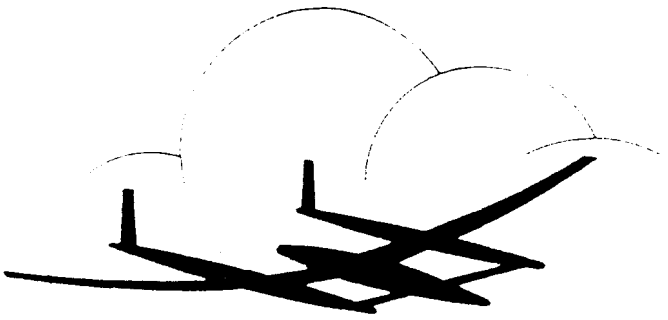


Figure-12

ALTERNATIVE-6 YEAR 2020 PROJECTED TRAFFIC VOLUMES

Only Alternative 6 Allows for Phasing of Facility Construction and Operation

Unlike the proposed freeway alternatives, there exists in the design of Alternative 6 an inherent flexibility. Not only does it allow for an eventual upgrade to freeway standards, but it also offers the possibility for phasing with regard to its construction and operation. The project could begin as an expressway bypassing SR 58. This would minimize costs while at the same time allowing trucks the opportunity to bypass Sierra Highway. As future conditions warrant, the project could be upgraded in stages: signals converted to interchanges, extension to SR 14 on the south, and widening Sierra Highway.



5.

Recommended Project

5.
Recommended Project

In light of the project requirements and following careful consideration of the evaluation criteria, Alternative 6—The Outer Loop Bypass—with inclusion of the SR 14 bypass option, was selected as the recommended alignment. This chapter will detail the scope of the project and then discuss the reasons for its selection as the superior alternative.

Project Scope

As was mentioned briefly in the previous chapter, Alternative 6 does not consist of one single capital-intensive construction project; rather, it encompass three distinctly separate and yet mutually beneficial highway development plans. These three plans are to be constructed in phases as described below.

Phase 1: SR 58 Bypass

The most urgently needed component of the project is the four-mile stretch of four-lane expressway extending from SR 58 north of Mojave to SR 58 east of Mojave along an alignment east of the Mojave airport. Also included in this SR 58 bypass phase will be the installation of traffic signals

at the three newly formed intersections of the bypass with the two state routes, as well as construction of a roadway overpass at the Trona Trolley branch of the Southern Pacific Transportation Company.

Phase 2: Connection to SR 14

Not until the expressway is extended to SR 14 south of Mojave will the facility be available for use by SR 14 traffic. This phase entails construction of a three-mile extension of the four-lane expressway from SR 58 east of Mojave to SR 14 approximately one mile south of Mojave. A roadway overpass will be needed at the crossing with the A.T.S.F. Railway, and a partial interchange is to be constructed at the junction of the bypass with SR 14.

Both Phases 1 and 2 of Alterative 6 are shown overlaid on an aerial view of Mojave on Figure 13. From the layout, one can clearly observe the location of the alignment with respect to the physical features of the town and its environs.

Phase 3: Upgrade Existing Sierra Highway

The future demands for increased capacity of the downtown highway can be accommodated by widening the highway to seven lanes over the approximately one-mile stretch of roadway connecting the north and south junctions of SR 14 and SR 58. Improvements would also be made, as needed, to the two existing signalized intersections (as shown on the previously-referenced Figure 9).

It is important to note that project cost is dependent on the proper sequencing of the construction phases. This is because the cost of the widening project will vary in accordance with the roadway designation of the Sierra Highway at the time of its construction. That is, after the completion of the SR 58 and SR 14 bypasses, the Sierra Highway can be widened as a *business route,* without the need for construction of a costly (estimated at $8 to $10 million) grade separation. By widening the Sierra Highway *first,* on the other hand, the effort would qualify as a state highway project. The upgrade would then need to fulfill a more stringent set of construction requirements that likely would include provision for a roadway overpass at the Trona Trolley line. Besides its added cost, construction of the overpass would severely impede traffic flow within the corridor. It is furthermore possible that the bypass projects, if undertaken in the initial phases, could be so effective in diverting traffic

Approx. Scale: 1" = 3500'

= Traffic Signal

Figure-13

RECOMMENDED ALIGNMENT

from the Sierra Highway that the widening project would be unnecessary. With the total project cost having been a key factor in selection of the alignment, the project recommendation is made with the understanding that construction be phased in the sequence specified.

Project Selection

As was noted in the project evaluation segment of the previous chapter, the Outer Loop Bypass offers several unique features that have contributed to its selection as the preferred alignment. In addition to its ability to fulfill the serviceability requirements within the corridor, it was this alternative that met with the highest degree of acceptance among the public and with those persons responsible for the project's implementation.

Study participants viewed the following factors to be of greatest significance in the selection of Alternative 6 as the preferred alignment.

Minimization of Cost

It has been estimated that $36.4 million will be required to put all three phases of Alternative 6 into operation. Though costly, the expenditure is $20 million less than the most economical of the other alternatives. With funding for the facility having been a major concern, a cost reduction of this magnitude offers great promise for implementation of the project in the most expeditious manner.

Project Phaseability

The phasing of project construction will effectively defer much of the aforementioned cost to the latter phases of construction. The initial expenditure will then be reduced to the cost associated with the bypass of SR 58 (Phase 1), approximately $18 million. Operation of the facility will be phased such that adequate serviceability standards are maintained; that is, capacity increases should stay with or ahead of growth.

Minimization of Project Impacts on Development in Mojave

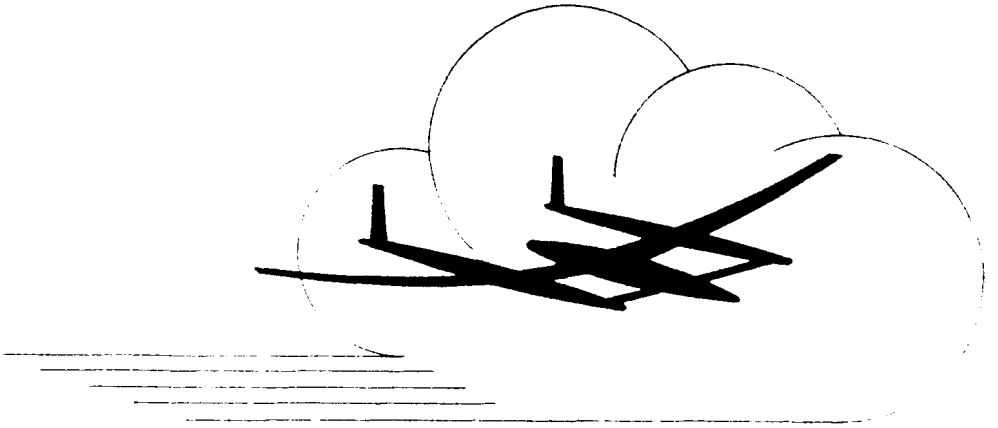
The alignment was devised such that none of the seven miles of right-of-way (of 210-foot width) would encroach on developed land. Therefore, no businesses or residences will need to be displaced in order to make room for the facility. Furthermore, the alignment's location east of town does not conflict with the future development of Mojave as dictated by the land use element of the Kern County General Plan. Thus, the development opportunities in western Mojave will remain open, unhindered by the bypass. There is also the possibility that the proposed facility will, in fact, encourage new and heretofore unanticipated development in eastern Mojave.

Removal of Commercial Trucks from Urban Streets

With the majority of tractor-trailer trucks using SR 58, a significant reduction in the number of these vehicles is expected upon completion of the first phase of the project. Their disappearance from downtown Mojave will not only help to improve local traffic flow, but will also serve to allay the concerns of residents with regard to safety.

Preservation of Support for the Mojave Economy

Provisions within the project, namely the aspect of phasing, allow for the growth of through traffic in Mojave while maintaining a sufficient level of serviceability. The reduction in traffic as a result of its diversion to the eastern bypass should largely be offset by the overall growth of traffic within the corridor. The number of vehicles using the Sierra Highway (along which are situated most of the commercial developments in Mojave) is, in fact, expected to increase at a modest rate through the year 2020. At such time as traffic volumes warrant, Phase 3—widening the Sierra Highway to seven lanes—can be implemented to provide accommodation to the increased demand. The two additional lanes will increase the capacity of the highway to 50,000 vehicles daily. That portion of the Mojave economy that flourishes on traveler-generated business may well expect to experience commensurate growth.



MOJAVE CORRIDOR STUDY

Appendices

APPENDIX A

SUMMARY OF PUBLIC MEETINGS

MOJAVE CORRIDOR STUDY
MINUTES OF FIRST MOJAVE PUBLIC MEETING
APRIL 10, 1990, 7:00 PM, VETERAN'S HALL

In Attendance were Ron Brummett and Roger Taylor of Kern COG, Lew Wood of Caltrans, Gary Black and Steve Hough of Barton-Aschman; representatives from--Kern County Public Works Department, Kern County Board of Supervisors, Assemblyman Wyman's Office, the Mojave Airport, and California City. Also 40-50 residents of Mojave and environs were present.

Ron Brummett asked Assemblyman and County Supervisor representatives for any opening statements. The offer was declined.

Lew Wood opened with a statement of Caltrans' position (to facilitate unobstructed traffic flow through Mojave) as compared to interests of Mojave residents (to continue to have through traffic stop in Mojave to use commercial facilities).

Gary Black described the preliminary alternatives and some background information related to the need for the study.

The floor was then opened to the public.

The following general comments and suggestions were made:

- Use existing highway as frontage road to expressway.
- Upgrade existing highway (Alternative 1).
- Divert both R.R. tracks and SR 14 to north (variation of Alternative 2)--added roadway but only one grade separation.
- Variation to O Street extension, with interchange at SR 14 and signal at Belshaw. (Alternative 5).
- Extension of O Street (Alternative 5) south of SR 58 will conflict with proposed school on Myer Road.
- Proximity of O Street extension (Alternative 5) to airport runway may be a problem--need FAA approval.
- Railroad track relocation (Alternatives 2 and 3) is universally agreed upon to be desirable.
- Outer loop bypass (Alternative 6) generally seen as threat to existing business in Mojave.

- Point made that *any* alternatives which will divert traffic from main highway has potentially devastating effect on Mojave economy.

- Construction of overpass for Oak Creek Road to K Street (over both R.R. tracks *and* main highway).

- Possibility of constructing expressway parallel to existing highway between it and mainline tracks.

- Possibility of using one-way couplets on existing SR 58 (to be SB) and K Street (to be NB) as an addition to Alternative 2.

- Importance of maintaining bypass within *sight* of Mojave commercial district (A "no" for Alternative 6 and a "maybe" for a modified Alternative 4).

- Issue of *funding*--Lew responded with the possibility of two scenarios:

  -- Failure of Prop. 111: Funding scarce--recommendation of this study becomes a long-term plan (perhaps 20+ years before construction would begin).

  -- Passage of Prop. 111: funding available--construction could begin in 5 to 7 years.

- Possibility that growth in Mojave could eventually make it "self-sufficient"; i.e., minimal dependence of Mojave economy on through traffic--a simple bypass such as Alternative 6, if not utilized for 10 to 20 years, may then have negligible adverse effect on Mojave community.

- Concern raised over SR 58 bypass (Alternative 6) as precursor to a future SR 14 bypass--and have complete bypass of Mojave altogether.

- Issue of possible improvements to SR 14 north of Mojave. Lew indicated that Caltrans *must* first resolve the Mojave Corridor issue before upgrading SR 14 to four lanes.

- Inability of Caltrans (as stated by Lew) to go ahead with the Mojave Bypass without first gaining approval from:

  -- Kern County, if Mojave remains unincorporated

  -- City of Mojave, if Mojave is incorporated.

- Three primary criteria on which alternative will be judged:

  -- Ability to provide traffic capacity for future conditions, cost, and public acceptance.

- Possibility of extending K Street to north end of Mojave so as to provide residents with access to commercial area without having to travel on the main highway.

- One resident noted the enhanced development potential for Mojave that the outer loop bypass (Alternative 6) would provide (i.e., Mojave would be "opened up").

- Fact that increasing the development potential of Mojave could spur growth which in turn could strengthen Mojave economically.

The meeting lasted one hour, starting promptly at 7:00 PM and ending at 8:00 PM.

MOJAVE CORRIDOR STUDY

First Public Meeting: **April 10, 1990** **Veterans Hall, Mojave**
7:00 PM

The purpose of this first public meeting is to gain input on the alignment alternatives and other study issues.

Study Purpose

State Route 58 through Mojave is becoming increasingly congested, particularly during holiday weekends. This condition is expected to worsen as Kern County's population and employment double over the next 20 years.

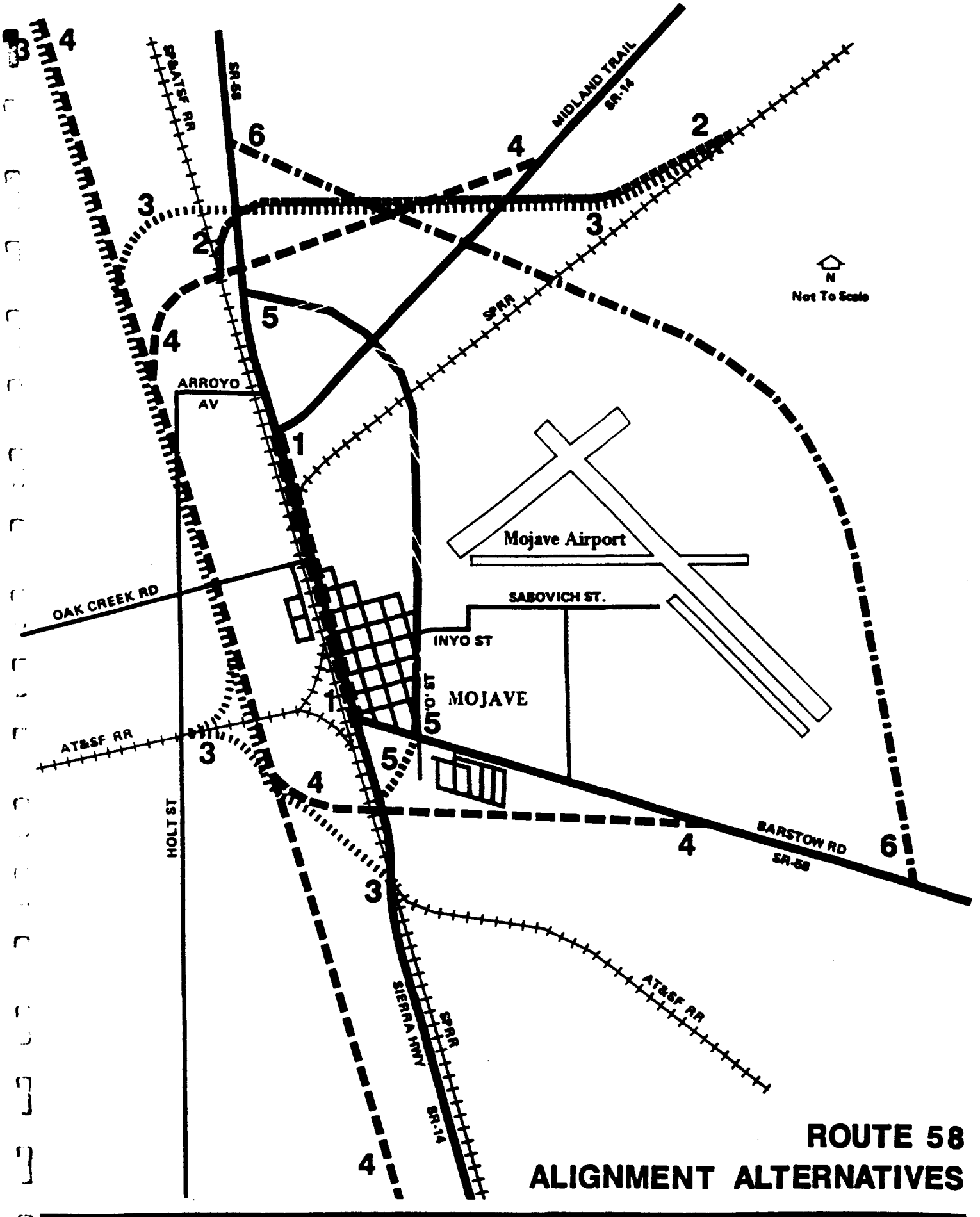
In anticipation of future overloading conditions, Caltrans approved in 1969 a SR 58 bypass of Mojave. The alignment paralleled existing SR 58, one-half mile west of town, and the cost was estimated at $100 million. Obtaining funding for a project of this size became difficult. This study is being undertaken to investigate alternatives to the approved bypass.

The Mojave Corridor Study is being sponsored by the Kern Council of Governments in association with Caltrans and Kern County. This study will explore the need for, and the impacts of, an alternative SR 58 alignment. If necessary, the study will identify a specific alignment for the highway. The consulting firm of Barton-Aschman Associates, Inc. of San Jose, California will conduct the study.

Project Need

A number of situations exist that contribute to Mojave's traffic problems. The more obvious of these are:

- High traffic volumes on SR 14 and SR 58 through Mojave on holiday weekends.
- Daily train interruptions on SR 58, and frequent train interruptions on Oak Creek Road.
- A high percentage of tractor-trailer trucks.
- Projected traffic increases due to growth both internal and external to Mojave.
- Potential designation of SR 58 as an interstate highway, requiring an upgrade to freeway standards.



ROUTE 58
ALIGNMENT ALTERNATIVES

Preliminary Alternatives

Following is the list of SR 58 alignment alternatives that have been identified so far. These are illustrated on the page at left. In this study, each alternative will be evaluated on the basis of its ability to provide traffic capacity. Project cost and impact on the community will also weigh heavily in the analysis.

1. ***Widen SR 58/14***—Upgrade existing highway to seven or nine lanes over 1-1/2 mile stretch between the south and north junctions of SR 58 and SR 14, if width is available. Further possibilites include installation of traffic signals at Oak Creek Road and at Inyo Street, and construction of a roadway overpass at the railroad crossing on SR 58.

2. ***Partial Relocation of Southern Pacific (S.P.) Railroad Tracks***—Relocate nearly 2 miles of R.R. track to approximately 1/2 mile north of the SR 58/14 north junction. Construct overpasses at both new R.R. crossings. Remove existing R.R. crossing on SR 58/14 in town.

3. ***Railroad Bypass***—Relocate S.P. and A.T.S.F. R.R. tracks 1/2 mile west. Construct overpass at Oak Creek Road crossing. Relocate S.P. R.R. tracks north as indicated in Alternative 2. Upgrade SR 58/14 as specified in Alternative 1.

4. ***Historic SR 58 Bypass (Adopted Alignment)***—Construction of a freeway 1/2 mile west of, and parallel to, the existing north/south alignments of SR 58 and SR 14. Include six freeway interchanges and three railroad overcrossings.

5. ***O Street Extension***—Extend O Street to intersect SR 14 and 58 approximately 1/2 mile north of the SR 14/58 north junction. Widen to four lanes, with installation of traffic signals at the four major intersections with SR 14 and SR 58. Construct roadway overpass at S.P.R.R. tracks in northern Mojave. As an option, extend to SR 14 south of town.

6. ***Outer Loop Bypass***—Construct four- or five-lane arterial street connecting SR 58 north of Mojave to SR 58 south of Mojave via an alignment east of the Mojave airport. Install traffic signals at the three major intersections with SR 14 and SR 58. Construct roadway overpass at S.P.R.R. tracks north of the airport.

Note that neither the desirability nor the feasibility of these alternatives has yet been determined. Furthermore, other possible alignments may be identified that would warrant consideration.

Public Participation

Of central importance to the success of a study such as this is the active participation of members of the local community. In order to ensure that the recommendations of this study will be well-founded, all efforts should be made to gather relevant information. As a prime source of this information, the people of Mojave can and should play an integral role in the planning process. The future development patterns in Mojave will, in large part, be influenced by the location of SR 58. It is therefore in the best interest of the Mojave community to attend this public meeting. All opinions and suggestions will be encouraged, and every effort will be made to address local concerns.

MOJAVE CORRIDOR STUDY
Minutes of California City Public Meeting
June 14, 1990, 7:00 PM, City Council Chambers

Ron Brummett of Kern COG opened the meeting by discussing the study process so far and the estimated completion date. Gary Black of Barton-Aschman discussed the alternatives and the evaluation with the aid of a handout (attached). He described the original six alternatives and discussed how they were reduced to three. He then went over the detailed evaluation, which resulted in two alternatives remaining. The two alternatives, 4 and 6, were described in detail.

California City residents generally favored Alternative 6 because it moves Route 58 and 14 closer to their city. They expressed concern, however, at the provision of signals rather than interchanges at the bypass junctions. Lew Wood, Caltrans District 9 Director, explained that the signalized junctions could be upgraded to interchanges as future volumes warranted. He stated that the $5 million price of an upgrade would be much easier to obtain than the $33 million necessary to build Alternative 6 with interchanges initially. Residents then realized that burdening Alternative 6 with interchange costs would make it undesirable compared to Alternative 4. Thus, it would not be in California City's best interest to insist on interchanges.

Residents asked if any money was available for the project. Mr. Wood responded that enough money was available for Alternative 6 due to the passage of Propositions 108 and 111. He stated that Alternative 4 would be more difficult to fund.

Residents expressed an urgent desire to have the Route 14/California City Boulevard junction upgraded to an interchange. Mr. Wood explained that the upgrade is already planned and funded as is a general widening of Route 14 to four lanes. Further work on these projects, however, is being held up until a decision is made regarding the future alignment of Route 14 through Mojave. Mr. Wood pointed out that only a routing decision, not actual construction of the bypass, was necessary for the California City Boulevard interchange to move forward.

Some residents asked whether Alternative 6 was too close to the Mojave airport, which would constrain its development. Ron Brummett of Kern COG explained that the agency would be meeting with airport officials to ask for their approval of the alignment. He expressed the belief that the alignment would benefit the airport through more convenient access and that approval would be likely.

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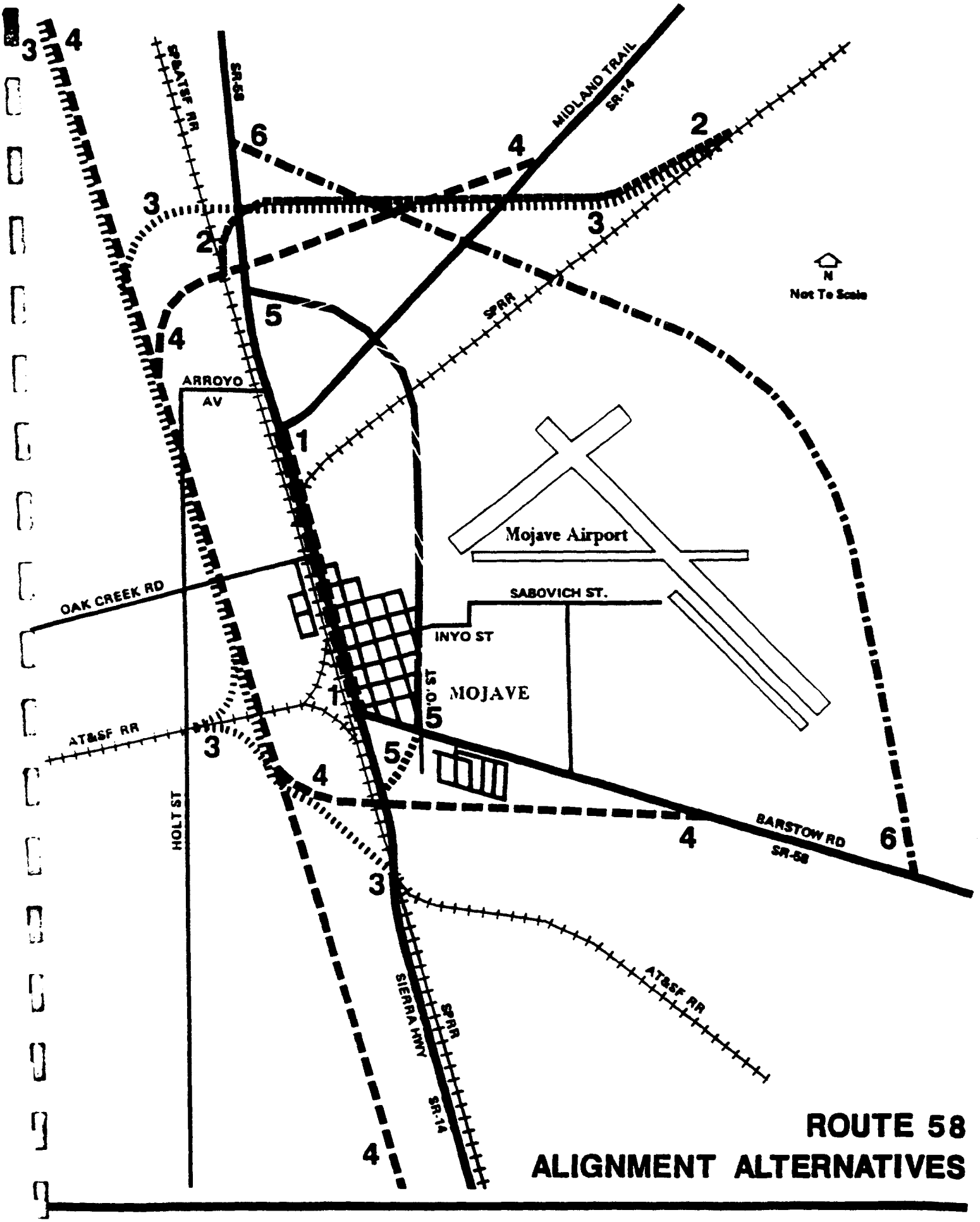
MOJAVE CORRIDOR STUDY

California City Meeting

June 14, 1990

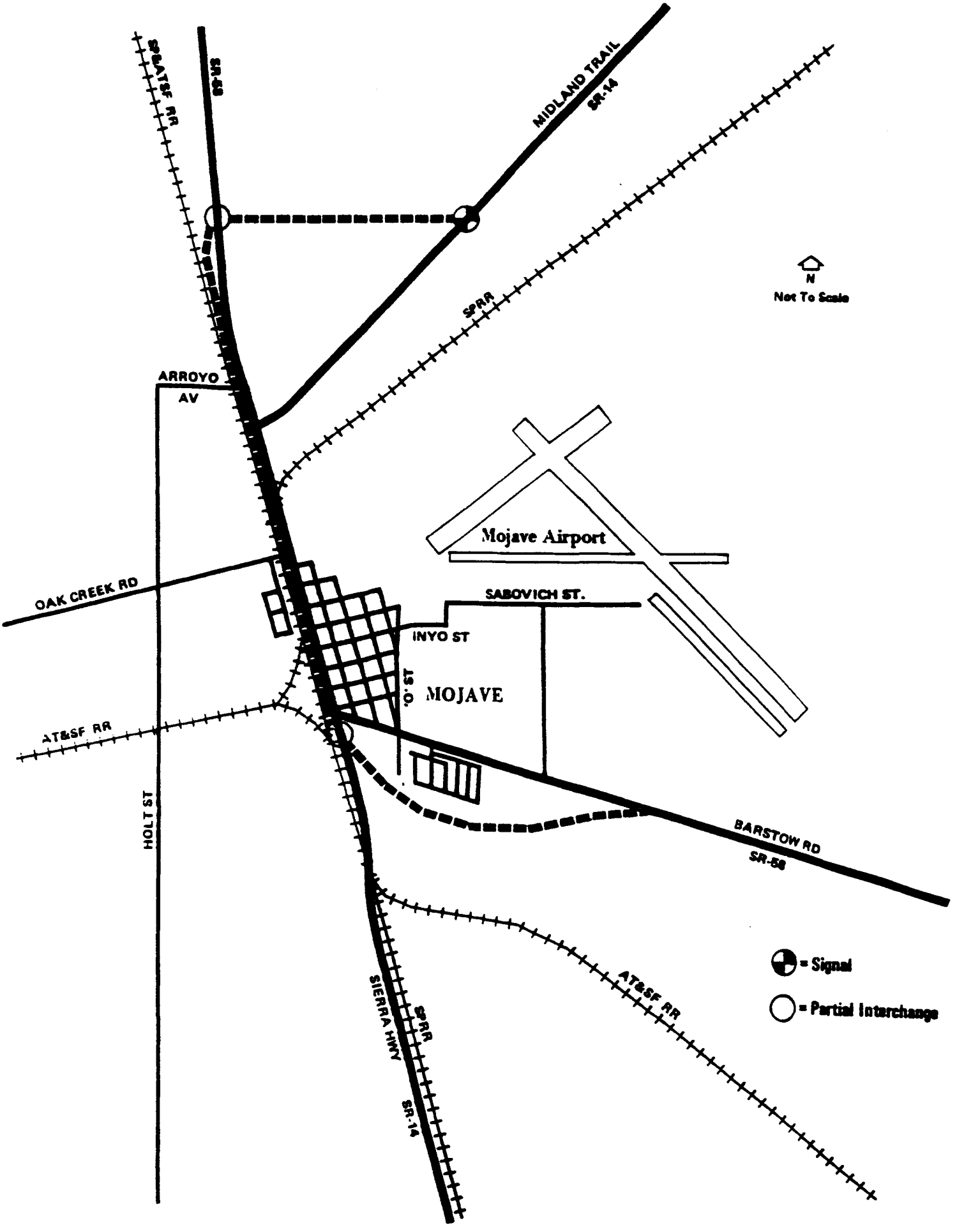
7:00 PM



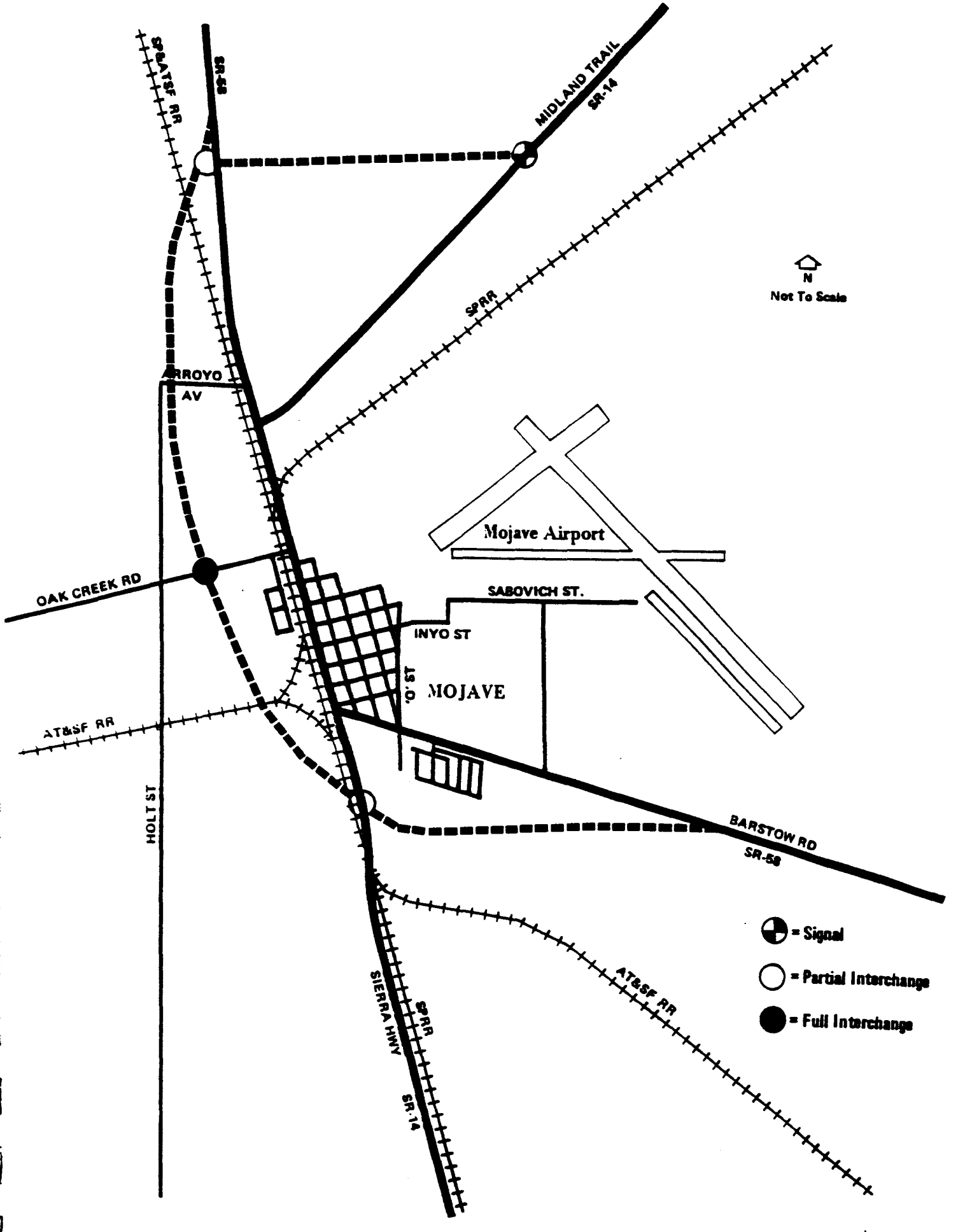
ROUTE 58
ALIGNMENT ALTERNATIVES

MOJAVE CORRIDOR STUDY
PRELIMINARY EVALUATION OF ALTERNATIVES

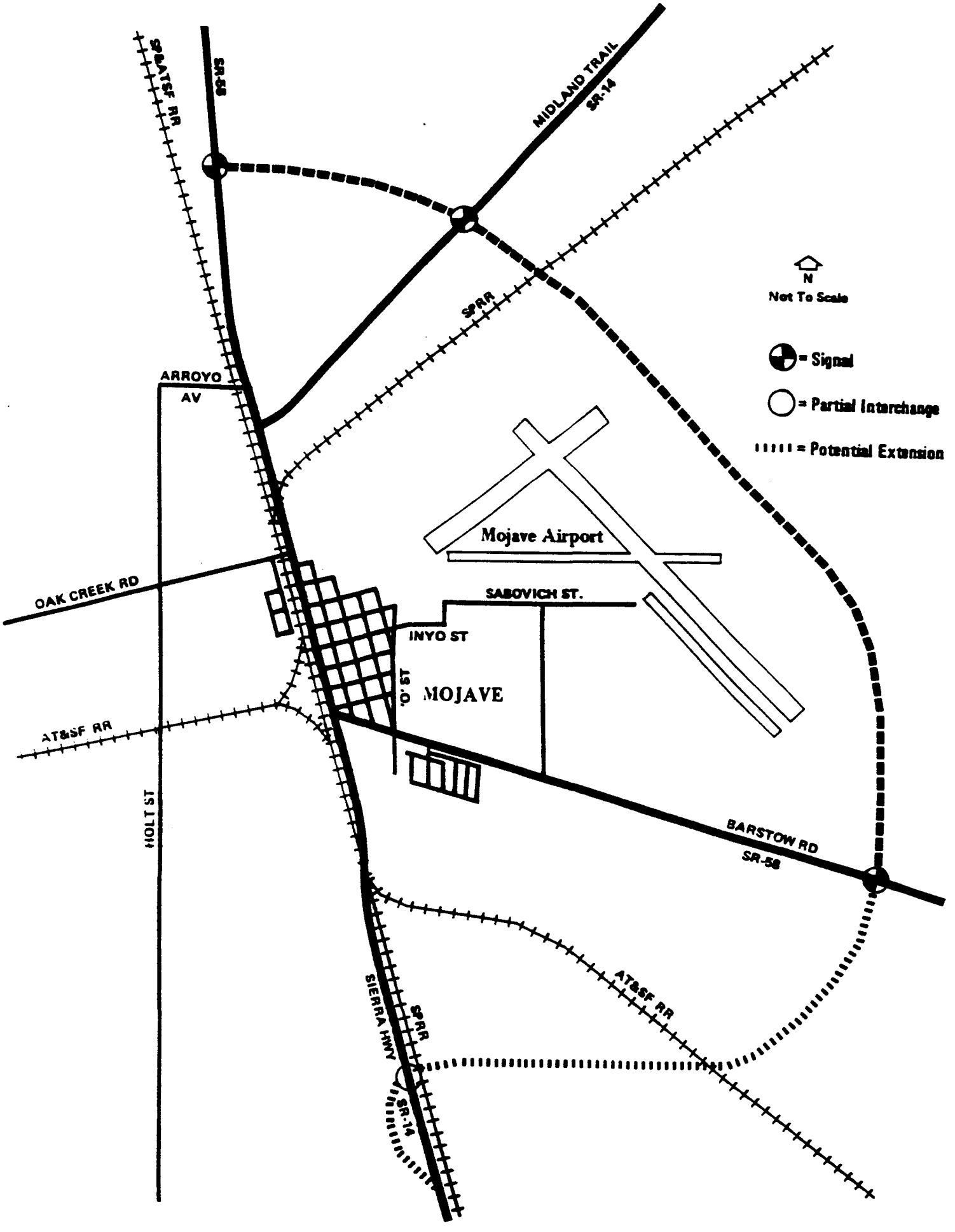
Criteria		Alternative					
		1	2	3	4	5	6
1.	Provide sufficient capacity for anticipated traffic levels.	Yes	No	Yes	Yes	Yes	Yes
2.	Allow upgrade to a freeway.	Yes	No	Yes	Yes	No	Yes
3.	Allow future connection to Route 14.	Yes	Yes	Yes	Yes	No	Yes
4.	Minimize cost.	Yes	Yes	No	Yes	Yes	Yes



ALTERNATIVE 1



ALTERNATIVE 4



ALTERNATIVE 6

MOJAVE CORRIDOR STUDY
DETAILED EVALUATION OF ALTERNATIVES

		Alternative					
		1		4		6	
		58 only	14 + 58	58 only	14 + 58	58 only	14 + 58
1.	2020 Average Daily Traffic (ADT) on bypass.	7,400	28,600	12,400	33,600	12,400	18,200
2.	2020 ADT on Sierra Highway.	44,800	23,500	39,900	18,600	39,900	34,000
3.	2020 volume-to-capacity ratio on Sierra Highway.	1.28	0.67	1.14	0.53	1.14	0.97
4.	Remaining at-grade railroad crossings.	1	1	1	1	1	1
5.	Total ADT on at-grade crossings.	44,800	23,500	39,900	18,600	39,900	34,000
6.	Remaining signalized intersections.	2	2	2	2	5	5
7.	Bypass type.	Freeway	Freeway	Freeway	Freeway	Expressway	Expressway
8.	Total cost ($ millions).	47.9	80.0	44.7	55.8	18.1	35.0
9.	Cost per user.	$1.95	$0.84	$1.09	$0.50	$0.44	$0.58
10.	Possible phasing.	No	No	No	No	Yes	Yes

MOJAVE CORRIDOR STUDY
SIGNIFICANT TECHNICAL STUDY CONCLUSIONS

1. Alternative 1 does not compare favorably with the other alternatives because it is more expensive and carries less traffic.

2. Alternative 2, widening the existing alignment, would not provide sufficient capacity to accommodate future traffic.

3. Alternative 4 is not justifiable unless it connects to Route 14 as well as Route 58.

4. Alternative 6, even if extended to Route 14, would not provide sufficient relief to Sierra Highway. Widening to six lanes would still be necessary.

M:EVA6/14/90
2262.30.01

MOJAVE CORRIDOR STUDY
Minutes of Second Mojave Public Meeting
June 18, 1990, 7:00 PM, Veteran's Hall

Bart Meays of Kern COG opened the meeting by discussing the study process so far and the steps that will occur following completion of the technical study. Gary Black of Barton-Aschman explained the evaluation of alternatives with the aid of a handout (attached). He showed how the original six alternatives were reduced to three, and the three were evaluated in detail. Following the detailed evaluation, two alternatives (4 and 6) were considered worthy of further study.

One or two local business owners continued to favor keeping the alignment where it exists today. They stated that improvements could be made to the north and south junctions and that this, in conjunction with moving the Lone Pine Branch railroad tracks, could improve capacity significantly. They further stated that keeping the alignment where it is would be good for business.

Mr. Black stated that improvement to the existing roadway could provide short-term congestion relief, but over 30 years the traffic increases would overwhelm the existing facility. Other local residents supported this viewpoint and stated that at peak times, such as when I-5 is closed, the congestion on Sierra Highway is intolerable and not good for business.

Regarding Alternative 4, many residents liked the fact that the alignment provides capacity for substantial congestion relief while at the same time maintaining proximity to Sierra Highway and providing a connection to Oak Creek Road. Other residents, however, were concerned with its impact on existing residential areas and development opportunities. The alignment would eliminate one apartment complex on Oak Creek Road and would pass very close to a residential neighborhood on Arroyo Avenue. Impacts would include noise and visual intrusion. In addition, the alignment passes through an area entirely planned for residential development.

One resident asked whether Alternative 4 could be aligned farther to the west so as to avoid impact on residential areas. Ron Brummett of Kern COG answered that those areas are also planned for development so the impact would not be avoided, and in addition the added cost for a longer alignment would be substantial.

Regarding Alternative 6, some residents expressed the fear that a bypass so far away from town would take away substantial business and create a "ghost town." Other persons noted that the volume remaining on Sierra Highway with the bypass would equal or exceed existing volumes so that businesses would not be affected. Some residents liked the idea of getting traffic out of town and into an area where no existing or planned residential areas would be affected.

Many residents asked about financing and timing of the project. Mr. Meays explained that Propositions 108 and 111 did not contain money specifically for this project but that Routes 58 and 14 are considered high-priority routes and money would be available. Mr. Brummett stated that a very fast-track project could be completed in 8 years but that a normal time frame would be 10 years.

Residents were also concerned about how a decision would be made about a final alignment and when public input was possible. Mr. Black explained that the outcome of this study would be a recommendation based on technical analysis. The next step would be approval by the Kern COG Board and the County Board of Supervisors. These boards may consider other factors besides technical merit in making their decisions. An EIR would also be required and approval by the California Transportation Commission. All of these steps allow opportunities for public input.

Some other points that were also raised: If Alternative 4 is chosen, the right-of-way should be purchased as soon as possible so that landowners are not in limbo for several years. Also, because of high winds in Mojave, construction will need to be managed carefully to avoid creating airborne dust.

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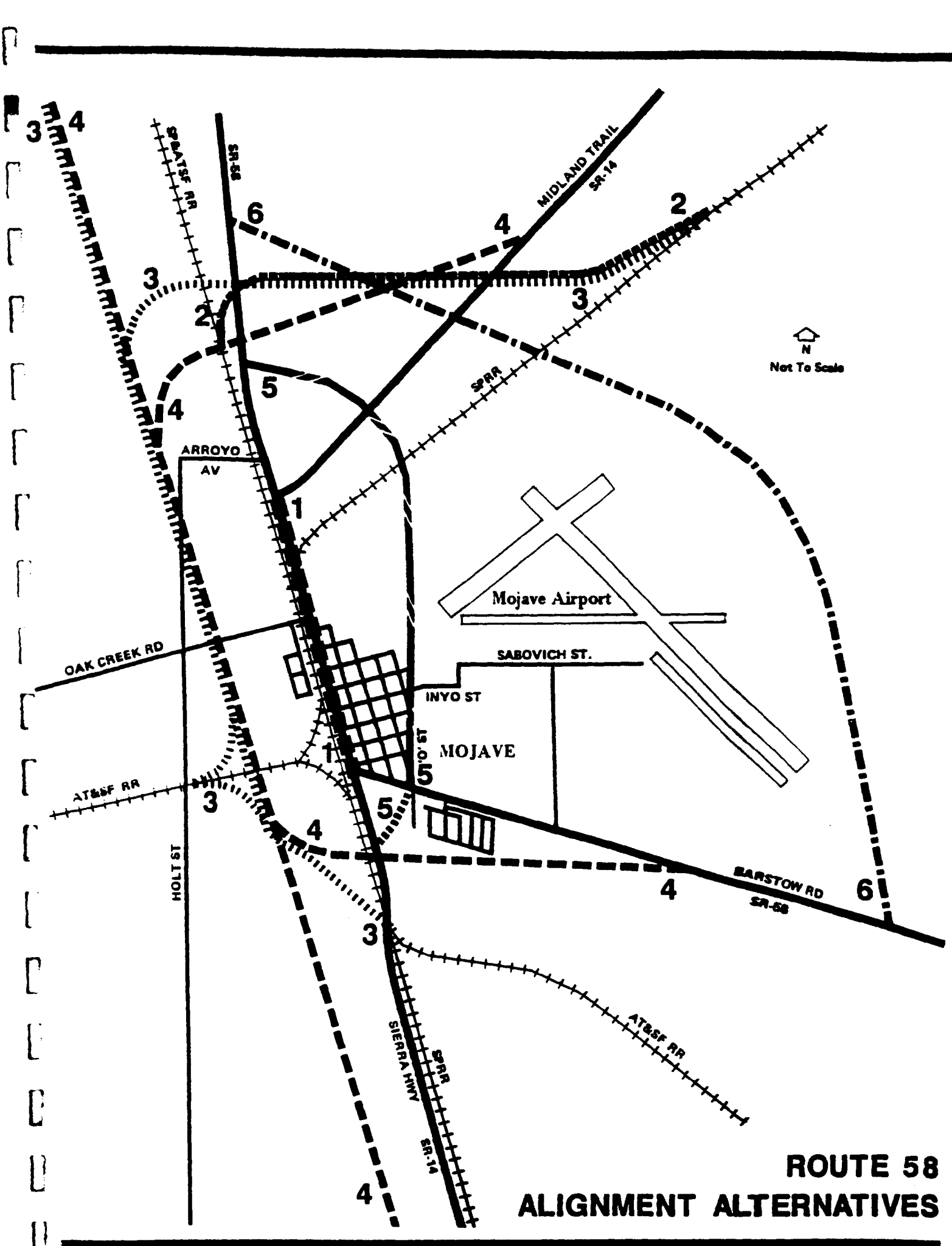
MOJAVE CORRIDOR STUDY

Second Mojave Public Meeting

June 18, 1990

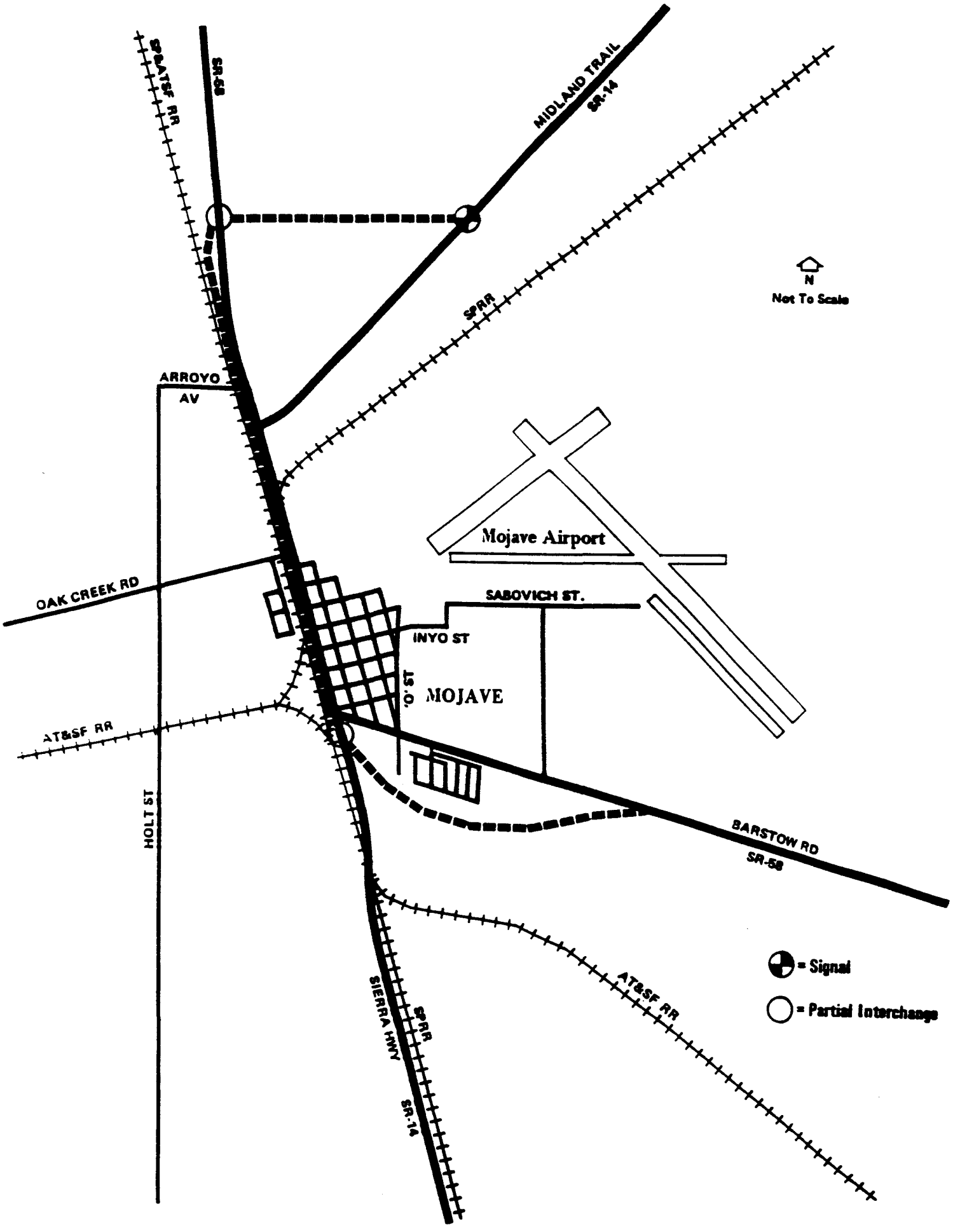
7:00 PM



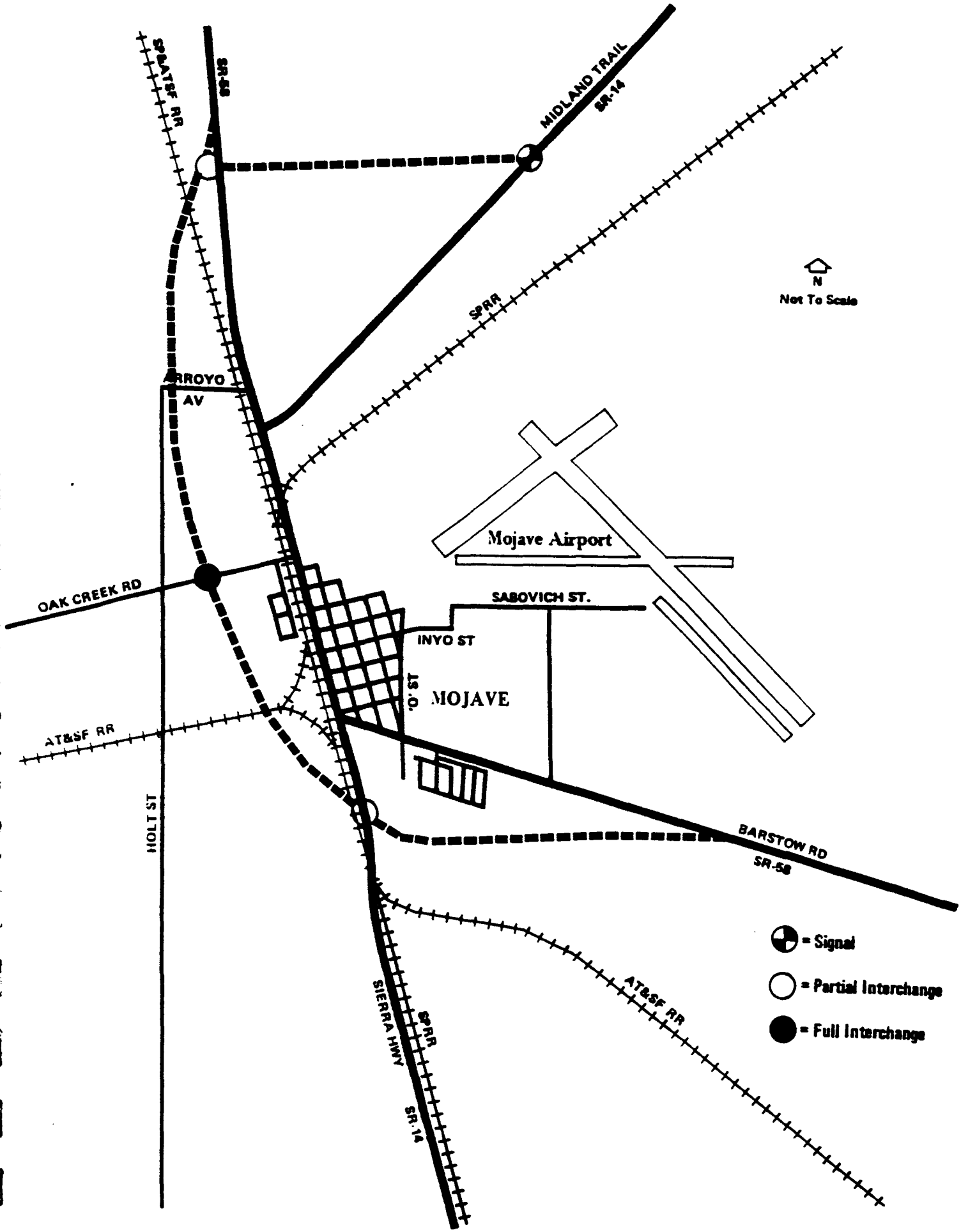
ROUTE 58
ALIGNMENT ALTERNATIVES

MOJAVE CORRIDOR STUDY
PRELIMINARY EVALUATION OF ALTERNATIVES

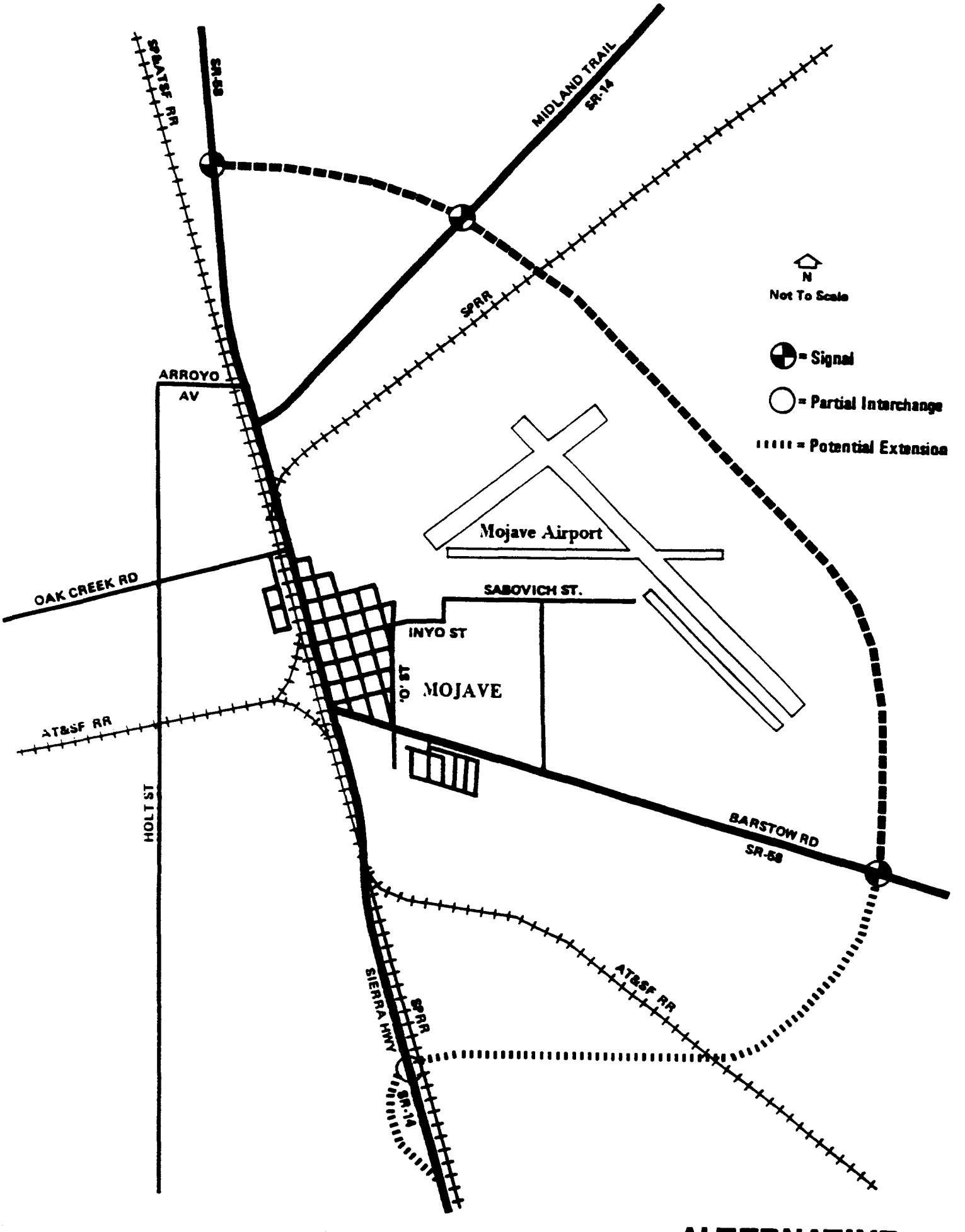
Criteria		Alternative					
		1	2	3	4	5	6
1.	Provide sufficient capacity for anticipated traffic levels.	Yes	No	Yes	Yes	Yes	Yes
2.	Allow upgrade to a freeway.	Yes	No	Yes	Yes	No	Yes
3.	Allow future connection to Route 14.	Yes	Yes	Yes	Yes	No	Yes
4.	Minimize cost.	Yes	Yes	No	Yes	Yes	Yes



ALTERNATIVE 1



ALTERNATIVE 4



ALTERNATIVE 6

MOJAVE CORRIDOR STUDY
DETAILED EVALUATION OF ALTERNATIVES

		Alternative					
		1		4		6	
		58 only	14 + 58	58 only	14 + 58	58 only	14 + 58
1.	2020 Average Daily Traffic (ADT) on bypass.	7,400	28,600	12,400	33,600	12,400	18,200
2.	2020 ADT on Sierra Highway.	44,800	23,500	39,900	18,600	39,900	34,000
3.	2020 volume-to-capacity ratio on Sierra Highway.	1.28	0.67	1.14	0.53	1.14	0.97
4.	Remaining at-grade railroad crossings.	1	1	1	1	1	1
5.	Total ADT on at-grade crossings.	44,800	23,500	39,900	18,600	39,900	34,000
6.	Remaining signalized intersections.	2	2	2	2	5	5
7.	Bypass type.	Freeway	Freeway	Freeway	Freeway	Expressway	Expressway
8.	Total cost ($ millions).	47.9	80.0	44.7	55.8	18.1	35.0
9.	Cost per user.	$1.95	$0.84	$1.09	$0.50	$0.44	$0.58
10.	Possible phasing.	No	No	No	No	Yes	Yes

MOJAVE CORRIDOR STUDY
THROUGH TRAFFIC PATTERNS (ADT)

Component	1988	2020
Through Traffic: 	3,000	7,400
	1,700	10,400
	4,600	10,800
	100	200
SubTotal	9,400	28,800
External-Internal	10,600	18,600
Internal	3,200	5,000
TOTAL	23,200	52,400

SFH/ADT-4/18/90-M:mdb
2262.30.01

MOJAVE CORRIDOR STUDY
SIGNIFICANT TECHNICAL STUDY CONCLUSIONS

1. Alternative 1 does not compare favorably with the other alternatives because it is more expensive and carries less traffic.

2. Alternative 2, widening the existing alignment, would not provide sufficient capacity to accommodate future traffic.

3. Alternative 4 is not justifiable unless it connects to Route 14 as well as Route 58.

4. Alternative 6, even if extended to Route 14, would not provide sufficient relief to Sierra Highway. Widening to six lanes would still be necessary.

M:EVA6/14/90
2262.30.01

APPENDIX B

RAILROAD RELOCATION FEASIBILITY STUDY

MOJAVE CORRIDOR STUDY

RAILROAD RELOCATION

JUNE 1990

Prepared for

Barton-Aschman Associates, Inc.
San Jose, California

by

De Leuw, Cather & Company
Planners & Engineers
120 Howard Street, Suite 850
San Francisco, California

The following statement is required by Section 6735 of the California Business and Professions Code:

The Registered Civil Engineer whose signature appears below attests to the technical information contained herein. For those portions of the Report based on input from technical specialists, the below Registered Civil Engineer attests as to the qualifications of such technical specialists who have provided data upon which the recommendations, conclusions, and decisions made in this Report are based.

Robert M. Barton, R.C.E. 7444
Chief Engineer

INTRODUCTION

The purpose of this report is to determine the feasibility and cost of railroad relocations associated with the Mojave Corridor Study being performed by Barton-Aschman Associates, Inc., for the Kern Council of Governments (KERNCOG), in association with CalTrans and Kern County.

The Mojave Corridor Study has identified six alternatives, as shown in Exhibit 1. Three of these alternatives involve the relocation of railroad facilities and are the subject of this report.

RAILROAD FACILITIES AND OPERATIONS

The existing railroad facilities in Mojave consist of a through main line, two branch line connections, depot and house tracks, and a switching yard.

The main line tracks through Mojave are a portion of the Southern Pacific Transportation Company's major trunk route between the San Joaquin Valley and Southern California, Arizona, New Mexico, and Texas points. Between Bakersfield and the junction in south Mojave, The Atchison, Topeka & Santa Fe Railway also operates trains over this Southern Pacific line under a trackage rights agreement. This jointly operated section of double track, which crosses the Tehachapi Pass, carries an average of 60 through trains per day, not including the Oak Creek and Searles Branch local trains discussed below. There is no passenger service through Mojave and none is seriously considered. These tracks are operated under Central Traffic Control (CTC) with a signal pole line on the east side. This joint use double track main line diverges into two separately owned single track main lines near the existing Route 14 overpass. In summary, the joint trackage between Bakersfield and Mojave carries one of the heaviest concentrations of rail traffic of any section of rail line in California.

The Oak Creek Branch extends westerly from Mojave for approximately nine miles. It is a single track line without signals. Train service consists of a once or twice daily local freight train which handles mostly coal westbound and cement eastbound.

The Searles (former Lone Pine) Branch extends northeasterly from Mojave approximately 48 miles to Searles. The track from Searles to Lone Pine is in place but is not in service. Southern Pacific motive power (locomotives) operates from Searles approximately 31 miles to Trona over the Trona Railroad. This is a single track line without signals. There is a passing siding located on the Searles Branch approximately 0.5 mile from its connection with the main line. Train service consists of two unit freight trains daily handling coal eastbound and potash westbound and a daily local freight train. Recently railroad service began to Imperial West Chemical Company located approximately 2-1/2 miles northeasterly of Mojave.

At the present time, to the east of the main line tracks in downtown Mojave, there are various railroad facilities including a pole line, tracks, depot, housing for signal and communication equipment, and two maintenance-of-way trailers. The tracks consist of a 4800-foot depot track, a house track, and two short sidings; however, these tracks are not presently in service. The depot is closed and a former freight house has been removed.

At this time, the railroad is in the process of relocating these facilities, with the possible exception of the pole line, so that the property can be leased or sold. An additional track is proposed to be constructed on the west side of the switching yard to replace the depot and house tracks. A historic society will probably relocate the depot building. The railroad is presently leasing space in Mojave for offices and crew headquarters. The signal and microwave communication equipment housings and the maintenance-of-way trailers will probably be relocated west of the main line tracks.

To the west of the main line tracks is a switching yard consisting of seven body tracks, an outside runaround track, and a wye track. A former enginehouse between the body and runaround tracks has been removed. Helper engines either operate all the way through to West Colton Yard or are cut off at the Tehachapi summit. Any required locomotive fueling is provided by truck. Both the Oak Creek and Searles local freight trains operate out of this yard. Two additional local trains also utilize the yard at night. The crew headquarters is located in leased space in Mojave. Presently, a company plans to locate a bagging plant facility with railroad service near the wye track area. This plant would receive rail shipments originating on the Searles Branch.

ALTERNATIVE DESCRIPTIONS

Alternative 1

Alternative 1 would upgrade the existing highway between the south and north junctions of SR-58 and SR-14. A highway overpass over the Searles Branch may be constructed.

The Southern Pacific main line right-of-way is located west of and adjacent to the existing highway. Since the SP is presently relocating all its facilities from the area east of the main line tracks, with the exception of the pole line, the feasibility of widening the existing highway is very possible. The only railroad relocation cost is that for relocating the pole line.

Alternative 2

Alternatve 2 would relocate approximately 2.4 miles of the Searles Branch with grade separations at SR-58 and SR-14.

The Searles Branch connection to the main line would be relocated approximately one-mile north of its existing location. The branch would be relocated on a new alignment which would meet the existing alignment approximately 2.5-miles east of Mojave in the vicinity of the Imperial West Chemical Company. Rail service should be continued to this industry. The pole line at the new main line connection would require minor relocation. The cost of the new grade separations has not been included in this report; however, the cost of roadway restoration at the existing grade crossings has been included.

Alternative 3

Alternative 3 would relocate all the railroad facilities approximately 1/2-mile to the west of Mojave. The Searles Branch connection would also be relocated northward. Grade separations would be constructed at SR-58, SR-14, and Oak Creek Road.

The Searles Branch would be relocated as in Alternative 2 with a connection to the relocated main line. The cost of the grade separations has not been included in this report; however, the cost of roadway restoration at the existing grade crossings has been included.

The joint use main line tracks and pole line would be relocated from a point approximately 2.4 miles north of Mojave to the diverging switches under the SR-14 overpass south of Mojave, a distance of approximately 3.6 miles.

The switching yard and wye track would also be relocated to the west. Along with the yard, the microwave communications facility and the maintenance-of-way trailers would also require relocation to the new yard site. Due to the increased distance between the relocated yard and the leased facilities in Mojave, a new office and crew quarters would be required at the relocated yard site. At this time, no allowances have been made for the relocation of the bagging plant facility which may be constructed near the wye track in the future.

COST ESTIMATES

Generalized order-of-magnitude cost estimates were prepared for the relocation of the railroad facilities as previously described for the three alternatives, and are shown in Tables 1, 2 and 3.

The track footages of the existing facilities were taken from the Southern Pacific station maps and were adjusted to reflect their current status and proposed changes for the near future. The track footages for the relocated main line and Searles Branch tracks were scaled from the 1" = 600' photographic plan provided to us by Barton-Aschman Associates. Unit costs were developed for the different types of trackwork, signal pole line relocation, subballast, earthwork, and grade crossing work. However, no costs were developed for the removal of existing track as these costs would be approximately equal to the salvage value of the released material. The unit costs which were developed are shown in Table 4.

Arbitrary monetary allowances were used for interlocking work, communication work, cross drainage, and other facilities. These estimates do not include the cost of grade separations, engineering design, construction management, construction contingency, or right-of-way. New and released right-of-way acreages were developed; however, no costs were assigned. These estimates are not intended to be precise, but are only an indication of the approximate cost that might be associated with a major railroad relocation.

TABLE 1

RAILROAD RELOCATION COST

ALTERNATIVE 1

Description	Quantity	Cost*
Trackwork	None	$ -0-
Signals		
Relocate Pole Line	7,000 L.F.	280,000
Communications	None	-0-
Grading and Drainage	None	-0-
Grade Crossings	None	-0-
Other Facilities	None	-0-
Contingency and Inflation	L.S.	56,000
TOTAL		$336,000
Right-of-Way		
New	None	-0-
Released	20 Ac	-0-

---

* Cost does not include grade separations, engineering design, construction management, construction contingency, or right-of-way costs.

TABLE 2

RAILROAD RELOCATION COST

ALTERNATIVE 2

Description	Quantity	Cost*
Trackwork		
Construct main line track	100 T.F.	$ 12,500
Construct secondary track	15,400 T.F.	1,771,000
Construct noninterlocked turnout	3 EA.	75,000
Signals		
Relocate pole line	500 L.F.	20,000
Communications	None	-0-
Grading and Drainage		
Subballast	8,900 C.Y	178,000
Earthwork	22,000 C.Y.	110,000
Cross Drainage	L.S	25,000
Grade Crossings		
Construct new with automatic protection	2 EA.	300,000
Remove existing and restore road	3 EA.	22,500
Other Facilities	None	-0-
Contingency and Inflation	L.S.	503,000
TOTAL		$3,017,000
Right-of-Way		
New	23 AC	-0-
Released	49 AC	-0-

---

* Cost does not include grade separations, engineering design, construction management, construction contingency, or right-of-way costs.

TABLE 3

RAILROAD RELOCATION COST

ALTERNATIVE 3

Description	Quantity	Cost*
Trackwork		
Construct main line track	38,000 T.F.	$ 4,750,000
Construct secondary track	15,400 T.F.	1,771,000
Construct yard track	41,700 T.F.	4,170,000
Construct interlocked turnout	6 EA.	360,000
Construct noninterlocked turnout	35 EA.	875,000
Signals		
Relocate pole line	19,000 T.F.	760,000
Interlocking plant	L.S.	640,000
Communications	L.S.	50,000
Grading and Drainage		
Subballast	62,300 C.Y.	1,246,000
Earthwork	144,000 C.Y.	720,000
Cross Drainage	L.S.	150,000
Grade Crossings		
Construct new with automatic protection	4 EA.	600,000
Remove existing and restore road	4 EA.	30,000
Other Facilities		
Building	5,000 S.F.	500,000
Utilities	L.S.	100,000
Contingency and Inflation	L.S.	3,344,000
TOTAL		$20,066,000
Right-of-Way		
New	90 AC	-0-
Released	180 AC	-0-

* Cost does not include grade separations, engineering design, construction management, construction contingency, or right-of-way costs.

TABLE 4

RAILROAD RELOCATION COST

UNIT COST

Item Description	Unit	Unit Cost
Trackwork		
Construct main line track	T.F.	$ 125
Construct secondary track	T.F.	115
Construct yard track	T.F.	100
Construct interlocked turnout	EA.	60,000
Construct noninterlocked turnout	EA.	25,000
Signals		
Relocate pole line	L.F.	40
Interlocking plant	L.S.	Allowance
Communications	L.S.	Allowance
Grading and Drainage		
Subballast	C.Y.	20
Earthwork	C.Y.	5
Cross Drainage	L.S.	Allowance
Grade Crossings		
Construct new with automatic protection	EA.	150,000
Remove existing and restore road	EA.	7,500
Other Facilities		
Building	S.F.	100
Utilities	L.S.	Allowance
Contingency and Inflation	L.S.	20 percent

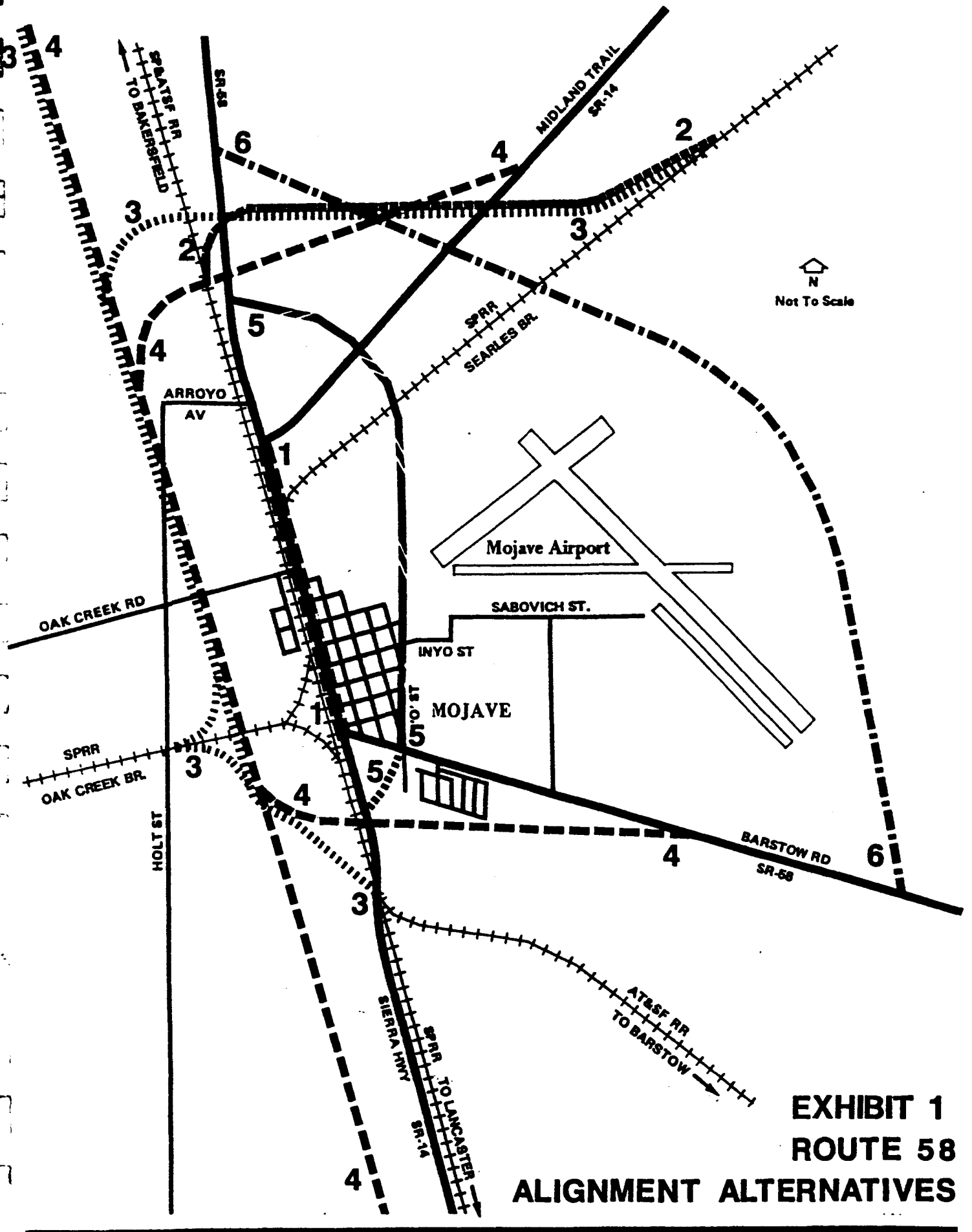


EXHIBIT 1
ROUTE 58
ALIGNMENT ALTERNATIVES

APPENDIX C

ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL SIGNIFICANCE CHECKLIST

This checklist was used to identify physical, biological, social and economic factors which might be impacted by teh proposed project. In many cases, the background studies performed in connection with this project clearly indicate the project will not affect a particular item. A "NO" answer in the first column documents this determination. Where there is a need for clarifying discussion, an asterisk is shown next to the answer. The discussion is in the seciton following the checklist.

PHYSICAL. Will the proposal either directly or indirectly:	YES OR NO	IF YES, IS IT SIGNIFICANT? YES OR NO
1. Appreciably change the topography or ground surface relief features?	NO	
2. Destroy, cover, or modify any unique geologic or physical features?	NO	
3. Result in unstable earth surfaces or increase the exposure of people or property to geologic or seismic hazards?	NO	
4. Result in or be affected by soil erosion or siltation (whether by water or wind)?	NO	
5. Result in the increased use of fuel or energy in large amounts or in a wasteful manner?	NO	
6. Result in an increase in the rate of use of any natural resource?	NO	
7. Result in the substantial depletion of any nonrenewable resource?	NO	
8. Violate any published Federal, State, or local standards pertaining to hazardous waste, solid waste or litter control?	NO	
9. Modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?	NO	
10. Encroach upon a floodplain or result in or be affected by floodwaters or tidal waves?	YES	NO
11. Adversely affect the quantity or quality of surface water, groundwater, or public water supply?	NO	
12. Result in the use of water in large amounts or in a wasteful manner?	NO	
13. Affect wetlands or riparian vegetation?	NO	
14. Violate or be inconsistent with Federal, State, or local water quality standards?	NO	
15. Result in changes in air movement, moisture, or temperature, or any climatic conditions?	NO	
16. Result in an increase in air pollutant emissions, adverse effects on or deterioration of ambient air quality?	NO	
17. Result in the creation of objectionable odors?	NO	
18. Violate or be inconsistent with Federal, State, or local air standards or control plans?	NO	
19. Result in an increase in noise levels or vibration for adjoining areas?	YES	NO
20. Result in any Federal, State, or local noise criteria being equal or exceeded?	NO	
21. Produce new light, glare, or shadows?	YES	NO

ENVIRONMENTAL SIGNIFICANCE CHECKLIST (Cont.)

	YES OR NO	IF YES, IS IT SIGNIFICANT? YES OR NO
BIOLOGICAL. Will the proposal result in (either directly or indirectly):		
22. Change in the diversity of species or number of any species of plants (including trees, shrubs, grass, microflora, and aquatic plants)?	NO	
23. Reduction of the numbers of or encroachment upon the critical habitat of any unique, threatened or endangered species of plants?	NO	
24. Introduction of new species of plants into an area, or result in a barrier to the normal replenishment of existing species?	NO	
25. Reduction in acreage of any agricultural crop or commercial timber stand, or affect prime, unique, or other farmland of State or local importance?	NO	
26. Removal or deterioration of existing fish or wildlife habitat?	YES	NO
27. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?	NO	
28. Reduction of the numbers of or encroachment upon the critical habitat of any unique, threatened or endangered species of animals?	YES	NO
29. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	MAYBE	NO
SOCIAL AND ECONOMIC. Will the proposal directly or indirectly:		
30. Cause disruption of orderly planned development?	NO	
31. Be inconsistent with any elements of adopted community plans, policies or goals, or the California Urban Strategy?	NO	
32. Be inconsistent with a Coastal Zone Mangement Plan?	NO	
33. Affect the location, distribution, density, or growth rate of the human population of an area?	MAYBE	NO
34. Affect life-styles, or neighborhood character or stability?	NO	
35. Affect minority, elderly, handicapped, transit-dependent, or other specific interest groups?	NO	
36. Divide or disrupt an established community?	NO	
37. Affect existing housing, require the acquisition of residential improvements or the displacement of people or create a demand for additional housing?	NO	
38. Affect employment, industry or commerce, or require the displacement of businesses or farms?	MAYBE	MAYBE
39. Affect property values or the local tax base?	YES	MAYBE
40. Affect any community facilities (including medical, educational, scientific, recreational, or religious institutions, ceremonial sites or sacred shrines)?	NO	
41. Affect public utilities, or police, fire, emergency or other public services?	NO	
42. Have substantial impact on existing transportation systems or alter present patterns of circulation or movement of people and/or goods?	YES	NO

ENVIRONMENTAL SIGNIFICANCE CHECKLIST (Cont.)

	YES OR NO	IF YES, IS IT SIGNIFICANT? YES OR NO
43. Generate additional traffic?	NO	
44. Affect or be affected by existing parking facilities or result in demand for new parking?	NO	
45. Involve a substantial risk of an explosion or the release of hazardous substances in the event of an accident or otherwise adversely affect overall public safety?	NO	
46. Result in alterations to waterborne, rail or air traffic?	NO	
47. Support large commercial or residential development?	YES	NO
48. Affect a significant archaeological or historic site, structure, object, or building?	NO	
49. Affect wild or scenic rivers or natural landmarks?	NO	
50. Affect any scenic resources or result in the obstruction of any scenic vista or view open to the public, or creation of an aesthetically offensive site open to public view?	NO	
51. Result in substantial impacts associated with construction activities (e.g., noise, dust, temporary drainage, traffic detours and temporary access, etc.)?	YES	NO
52. Result in the use of any publicly-owned land from a park, recreation area, or wildlife and waterfowl refuge?	NO	

MANDATORY FINDINGS OF SIGNIFICANCE.	YES OR NO
53. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	NO
54. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)	NO
55. Does the project have environmental effects which are individually limited, but cumulatively considerable? Cumulatively considerable means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. It includes the effects of other projects which interact with this project and, together, are considerable.	NO
56. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	NO