HAM LANE EIR PUBLIC HEARING SET

CC53d
CC45a
Pg279

Council was apprised that the Draft Environmental Impact Report for the Ham Lane Improvement Project, Lodi Avenue to Elm Street, is being circulated for public comment. During the preparation of the EIR an informal public meeting was held to review the project with residents to seek out their concerns. The proposed public hearing will provide a formal opportunity for concerned citizens to express their views on the EIR. This hearing will not be to decide on the project itself, but only whether the impacts of the project and its alternatives are adequately addressed in the EIR.

Following discussion, with questions being directed to Staff, Council, on motion of Mayor Snider, Reid second, set a Public Hearing on November 7, 1984 at 7:30 p.m. to receive comments on the Ham Lane Environmental Impact Report.

CITY OF LODI

PUBLIC WORKS DEPARTMENT

COUNCIL COMMUNICATION

TO: City Council

FROM: City Manager

DATE: October 11, 1984

SUBJECT: Ham Lane Improvement Project
Lodi Avenue to Elm Street

RECOMMENDED ACTION: That the City Council set a Public Hearing for November 7, 1984 to receive comments of the Ham Lane Environmental Impact Report.

BACKGROUND INFORMATION: The Draft Environmental Impact Report for the Ham Lane Improvement Project, Lodi Avenue to Elm Street, is being circulated for public comment. (copy attached) During the preparation of the EIR an informal public meeting was held to review the project with residents and seek out their concerns. This public hearing will provide a formal opportunity for concerned citizens to express their views on the EIR. This hearing will not be to decide on the project itself, but only whether the impacts of the project and its alternatives are adequately addressed in the EIR. Following the meeting, staff will begin to prepare any responses to comments for inclusion in the Final EIR.

The City Council will be asked to set another hearing date, probably December 5, to certify the Final EIR as being adequate and make a decision on the project.

JACK L. RONSKO
Public Works Director

Attachment

JLR/RCP/ns

APPROVED:

HENRY A. GLAVES, City Manager

FILE NO.

NOTICE OF PUBLIC HEARING BY THE CITY COUNCIL OF THE CITY OF LODI TO CONSIDER THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE HAM LANE IMPROVEMENT PROJECT, LODI AVENUE TO ELM STREET, LODI

NOTICE IS HEREBY GIVEN that on Wednesday, November 7, 1984 at the hour of 7:30 p.m. or as thereafter as the matter may be heard, the Lodi City Council will conduct a public hearing in the Council Chambers, City Hall, 221 West Pine Street, Lodi, California, to consider the Draft Environmental Impact Report for the Ham Lane Project. A copy of the EIR is available at the Lodi Public Library, 201 West Locust Street, Lodi, or copies will be provided if you call the City of Lodi Public Works Department at 333-6706.

The purpose of this Public Hearing is to hear comments on the adequacy of the EIR. The desirability of the project or its alternatives are not matters for consideration at this Public Hearing.

Based on comments received at this public hearing, and any other submittals made during the review period, the City Staff will prepare responses and the Final EIR.

A second hearing will be held to discuss the Final EIR after which time a decision will be made on the project. The tentative date and time for this second hearing is 7:30 p.m. December 5, 1984.

Written comments should be received by November 21, 1984 for inclusion in the Final EIR.

Information regarding this EIR or the project in general may be obtained by calling Richard Prima, Chief Civil Engineer, City of Lodi, Public Works Department at 333-6706.

Written comments may be filed with the City Clerk at any time prior to hearing scheduled herein and oral statements may be made at said hearing.

Dated: October 17, 1984

By Order of the Lodi City Council

Alice M. Reimche
Alice M. Reimche
City Clerk

STATE OF CALIFORNIA—OFFICE OF THE GOVERNOR GEORGE DEUKMEJIAN, Governor

OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

(916/445-0613)

Richard C. Prima, Jr.
City of Lodi
221 W. Pine St.
Lodi, CA 95240

November 30, 1984

Subject: Ham Lane Improvement Project
SCH #84101612

Dear Mr. Prima:

The State Clearinghouse submitted the above named environmental document to selected state agencies for review. The review period is closed and none of the state agencies have comments.

This letter certifies only that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act (EIR Guidelines, Section 15205). Where applicable, this should not be construed as a waiver of any jurisdictional authority or title interests of the State of California.

The project may still require approval from state agencies with permit authority or jurisdiction by law. If so, the state agencies will have to use the environmental document in their decision-making. Please contact them immediately after the document is finalized with a copy of the final document, the Notice of Determination, adopted mitigation measures, and any statements of overriding considerations.

Once the document is adopted (Negative Declaration) or certified (final EIR) and if a decision is made to approve the project, a Notice of Determination must be filed with the County Clerk. If the project requires discretionary approval from any state agency, the Notice of Determination must also be filed with the Secretary for Resources (EIR Guidelines, Section 15094(b)).

Sincerely,

John Ohanian

John B. Ohanian
Chief Deputy Director

NOTICE OF PUBLIC HEARING BY THE CITY COUNCIL OF THE CITY OF LODI TO CONSIDER THE FINAL ENVIRONMENTAL IMPACT REPORT FOR THE HAM LANE IMPROVEMENT PROJECT, LODI AVENUE TO ELM STREET, LODI

NOTICE IS HEREBY GIVEN that on Wednesday, December 5, 1984 at the hour of 7:30 p.m., or as soon thereafter as the matter may be heard, the Lodi City Council will conduct a public hearing in the Council Chambers, City Hall, 221 West Pine Street, Lodi, California, to consider the Final Environmental Impact Report for the Ham Lane project. A copy of the EIR will be provided if you call the City of Lodi Public Works Department at 333-6706.

Information regarding this EIR or the project in general may be obtained by calling Richard Primm, Chief Civil Engineer, City of Lodi, Public Works Department at 333-6706.

Written comments may be filed with the City Clerk at any time prior to hearing scheduled herein and oral statements may be made at said hearing.

Dated: November 7, 1984

By Order of the Lodi City Council

Alice M. Reimche
City Clerk

Draft
Environmental Impact Report

Ham Lane Improvement Plan

Prepared for City of Lodi

September 1984

Kate Burdick Land Use & Planning Consultant

CITY COUNCIL

JOHN R. (Randy) SNIDER, Mayor
DAVID M. HINCHMAN
Mayor Pro Tempore
EVELYN M. OLSON
JAMES W. PINKERTON, Jr.
FRED M. REID

CITY OF LODI

CITY HALL, 221 WEST PINE STREET
POST OFFICE BOX 320
LODI, CALIFORNIA 95241
(209) 334-5634

HENRY A. GLAVES, Jr.
City Manager

ALICE M. REIMCHE
City Clerk

RONALD M. STEIN
City Attorney

October 18, 1984

Dear Interested Party

SUBJECT: Ham Lane Improvement Project
Lodi Avenue to Elm Street

Attached is the Draft Environmental Impact Report for the Ham Lane project.

The City Council has set a public hearing for 7:30 P.M., November 7, 1984, to hear comments on the adequacy of the EIR. They will not discuss the desirability of the project or its alternatives, nor make any decisions on the project at this meeting. Based on comments received at the meeting, and any others submitted during the review period, City staff will prepare responses and the Final EIR. Written comments will be received up through November 21, 1984, for inclusion in the Final EIR. A second hearing will be held to discuss the Final and make a decision on the project. The tentative date for this hearing is December 5, 1984.

If you have any questions about the EIR or the project in general, feel free to call Richard Prima at 333-6706.

Sincerely

Jack L. Ronsko
Public Works Director

JLR/RCP/eeh

DRAFT

FOCUSED ENVIRONMENTAL IMPACT REPORT

HAM LANE IMPROVEMENT PROJECT

LAST DATE TO COMMENT
NOV 21 1984

Prepared for

CITY OF LODI

September 1984

Prepared by

KATE BURDICK

1545 Shirland Tract, Auburn, CA 95603

Table of Contents

LIST OF FIGURES

LIST OF TABLES

Introduction

This Environmental Impact Report (EIR) addresses the potential environmental effects of the City of Lodi's proposed street widening Improvement Project on Ham Lane. The project calls for widening four blocks of Ham Lane between Lodi Avenue and Elm Street from an existing two-lane road to a four-lane road. Other improvements such as replacement of curbs, gutters, sidewalks and drainage improvements also are planned as a part of this project. A full description of the project is presented in the Project Description section of this report.

The project was initially proposed in 1978 and an Environmental Impact Report was completed in May 1978. While that EIR contains useful information, conditions have changed enough to warrant revision of the previously prepared EIR. Therefore, this document is a Focused EIR which addresses only those issues determined by the City of Lodi to require revision since the time the last EIR was prepared. The issues evaluated in this report include loss of street trees, traffic, noise, air quality, land use and neighborhood character and construction related impacts. In addition, a range of project alternatives are fully discussed. A summary of the identified project impacts is presented in the following section, Summary of Environmental Impacts.

Because the proposed project is considered controversial by affected citizens, several attempts have been made to solicit citizen input early in the review process so that all concerns could be incorporated into this report. A letter was sent by the City of Lodi to all owners and residents within the Ham Lane Improvement Project area informing them of the EIR process and of an informal meeting held for citizens to express their concerns. Those unable to attend the meeting were encouraged to write or call the City or this consultant with any concerns. About 32 people attended the informational meeting held August 23 and some calls and a letter have been received to date. Public comment also can be made during the review period for this Draft EIR, and at a public hearing before the City Council.

This EIR has been prepared for the City of Lodi in accordance with City requirements and the State CEQA (California Environmental Quality Act) Guidelines. As stated in these guidelines, an EIR is an "infomational document" with the intended purpose to: "inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects and describe reasonable alternatives to the project." Althouugh the EIR does not control the City's ultimate decision on the project, the City must consider the information in the EIR and respond to each significant effect identified in the EIR. As defined in the CEQA Guidelines, "significant effect on the environment means:

> . . . a substantial or potentially substantial adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise and

objects of historic or aesthetic significance. An economic or social change by itself shall not be considered in determining whether the physical change is significant.

HOW TO USE THIS REPORT

This report is divided into six sections: Summary of Environmental Effects, Project Description, Environmental Setting, Impacts and Mitigations, Environmental Evaluation, Persons Contacted and the Appendices. Each of these sections has its own purpose and serves to aid the reader in fully understanding the project and its implications. A brief description of each section follows:

Summary of Environmental Effects

This section serves to list all of the potential impacts of the project. Any mitigations which will reduce or eliminate project impacts are also presented. The level of significance with and without mitigation is identified. This section is an overview for use during discussion of the project and does not include any discussion. Use of the summary only, without reading the supporting text, could lead to an incomplete understanding of the project.

Project Description

This section presents a full description of the proposed project.

Environmental Settings, Impacts and Mitigations

This section is based on studies prepared by expert subcontractor or members of the staff. This section serves to describe existing conditions, identify potential impacts of the project and present mitigations to minimize identified impacts. The text is based on technical reports which are contained at the back of the report in the Appendices. Anyone interested in the actual methods of evaluation should refer to the Appendices while people interested in the results of the evaluation will find the information in this part of the report.

Environmental Evaluation

This portion of the report is required by state law (CEQA). These sections are used to identify, for decision makers and the general public, the unavoidable effects of the project, the potential for growth inducement and any alternative design options which will achieve the same general goals.

Persons Contacted

This is a list of all the people who were contacted, either in person or by telephone, in the course of the report preparation. The subcontractors who prepared technical reports are also listed.

Appendices

Technical reports prepared by specialists are included in their entirety and address traffic, air quality, noise and biologic issues.

Summary of Environmental Effects

Summary of Environmental Impacts

EXISTING CONDITIONS

The project under consideration is widening of Ham Lane between Lodi Avenue and Elm Street within the City of Lodi. The project would expand this street from two lanes to four lanes with associated road improvements. A full description of the proposed improvements is presented in the Project Description section of this report.

The following list itemizes all impacts, both significant and insignificant, that were identified during the course of this environmental analysis. The level of significance of each impact is presented, both with and without suggested mitigation measures. The mitigated impact implies that all mitigations should be followed, unless otherwise indicated in this Summary. Adverse impacts that are unavoidable and which cannot be mitigated to a level of insignificance are noted. Because no Initial Study was prepared on the project due to the fact that a previous EIR had been prepared, the City prepared a Scope of Work which detailed areas of investigation. All effects that were deemed potentially significant have been evaluated in this report.

This Summary should be used in conjunction with a thorough reading of the report. The Summary is intended as an overview; the report serves as the basis for this Summary.

Project Impact	Mitigated Impact	
		<u>PLANTS</u>
S	M	-- Loss of street trees and landscaping.

<u>Mitigation</u>

1) Retain existing trees within the undeveloped right-of-way.

2) Replace removed trees and shrubs with species of similar type and nuumber. Prepare landscaping plan to identify the type, number, location, spacing and maintenance of trees to be replanted.

S=Significant. M=Moderate. I=Insignificant. B=Beneficial.

OR

3) Redesign project according to proposed Alternative B.

Project Impact	Mitigated Impact		
I	I	--	Slight potential for root disturbance of existing trees due to project construction.

Mitigation

4) Exercise caution during sidewalk construction to minimize potential root disturbance whenever possible.

TRAFFIC

B	B	--	Decrease in existing and long-range traffic congestion.

Mitigation

5) None required.

M	M	--	Decrease in pedestrian safety.

Mitigation

6) Provide additional pedestrian safety devices (crosswalks, roadway warning signs, traffic guards, traffic or pedestrian signals).

M	I	--	Potential delays to cross traffic.

Mitigation

7) Install traffic lights as signal warrants are met.

M	M-I	--	Potential for increased vehicle speeds.

Mitigation

8) Install speed limit signs, increase enforcement, lower speed limits.

M	M-I	--	Decreased on-street parking.

Mitigation

9) Provide that all future developments have adequate off-street parking.

NOISE

S S -- Increase in vehicular noise.

Mitigation

10) Install sealed windows across house frontages wherever feasible.

11) Reduce vehicle speed.

12) Encourage carpools, bicycle use and mass transit to reduce vehicle volumes.

13) Enforce vehicle codes concerning faulty or modified exhaust systems.

14) Implement an alternative which reduces the distance between affected properties and travel lanes.

S M -- Short-term increase in construction related vehicle noise.

Mitigation

15) Require the contractor to utilize construction equipment of quiet design that is well-maintained wherever feasible.

16) Require the installation of superior mufflers and engine enclosure panels on construction equipment where feasible.

17) Restrict equipment usage to 7:30 A.M. to 5:30 P.M.

AIR QUALITY

B B -- Incremental decrease in local emission concentrations.

Mitigation

18) None required.

M I -- Temporary construction-related increase in dust.

Mitigation

19) Use water sprinkling applications daily on dusty working areas.

LAND USE

S M -- Change in the perceived neighborhood character.

Mitigation

20) Follow landscaping Mitigation #1-3.

21) Provide crosswalks and traffic signals to minimize traffic safety hazards.

22) Insure that proper visibility from resident driveways is maintained when street trees are replanted.

23) Consider installation of automatic garage door openers where necessary to provide safe resident access.

24) Follow noise mitigation #10-14.

25) Where appropriate, consider provision of fencing or lattice to provide a sense of resident privacy (may require zoning variances).

CONSTRUCTION IMPACTS

M M -- Local traffic disruption and loss of parking during construction.

Mitigation

26) Plan detour routes for minimal neighborhood disruption.

27) Notify emergency services of street closures.

28) Plan construction around peak traffic times.

S M -- Temporary increase in noise.

Mitigation

29) Follow mitigation #15-17.

M I -- Temporary decrease in air quality.

Mitigation

30) Follow mitigation #19.

M I -- Temporary disruption of local businesses.

Mitigation

31) Schedule construction to be completed as soon as possible in front of area businesses.

I I -- Potential disruption of subsurface utilities.

Mitigation

32) Plan construction to avoid underground utilities.

Project Description

PROJECT LOCATION

The project site is located in the western side of the City of Lodi, in San Joaquin County, approximately 7 miles east of Highway 5 and 1 mile north of Highway 12. Ham Lane is a major north-south arterial in the City and intersects Highway 12 at the first signalized intersection at the City's western entrance on Highway 12.

Ham Lane extends from above Turner Road on the north approximately three miles to Harney Lane on the south. Except for the area of the project site, Ham Lane is a four-lane, two-directional street, with stop signs and signals at key intersections.

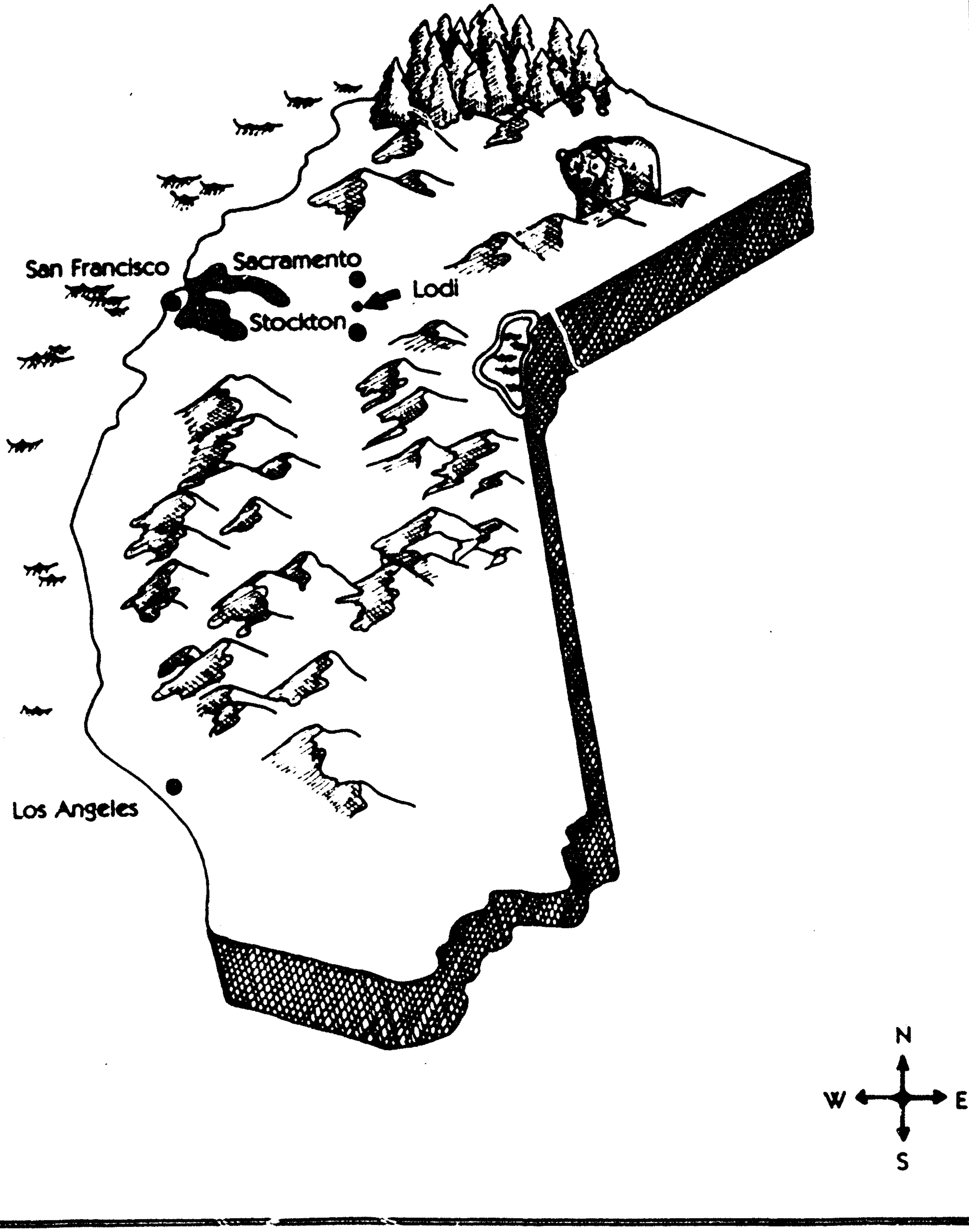
The project site comprises a four-block segment of Ham Lane between Lodi Avenue on the south and Elm Street on the north (see Figure 2). This section of Ham Lane consist of two lanes, the only existing two-lane section of Ham Lane except for the extreme north end within Lakewood Subdivision. This portion of the street has 50-, 65- to 80-foot wide right-of-way (R/W) with a section of 80-foot R/W at Lodi Avenue. The current developed roadway ranges in width from 44 to 50 feet. The narrowest portion of the project area is between Lodi Avenue and Walnut Street. (See Project Characteristics below for further details on existing and proposed improvements.)

The project site is located within an urbanized section of the City. Residential use is predominant along the project segment of Ham Lane, dominated by single-family houses. Office and public uses are predominant among the residential uses along Ham Lane south of the project section. Commercial uses are found on Ham Lane between Elm Street and Lockeford Street. (See land use section of this report for further details regarding surrounding land uses.) The project segment of Ham Lane also is characterized by large, tall trees which line the street and are described in the Plants section of this report.

PROJECT CHARACTERISTICS

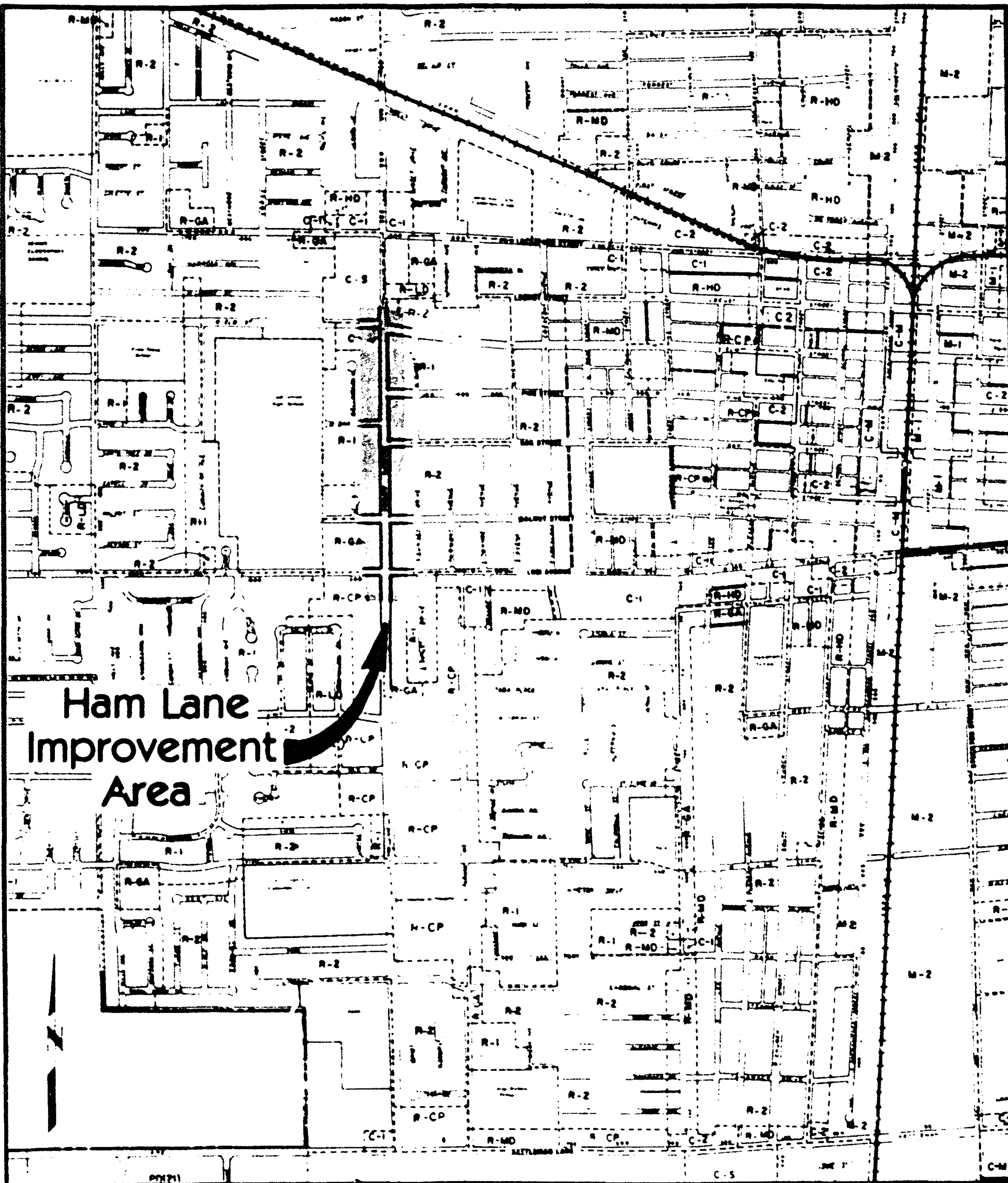
<u>Project Objectives</u>

The purpose of the project is to alleviate existing and projected traffic congestion and improve traffic flow along the four-block project section of Ham Lane. Ham Lane is an arterial road which facilitates major north-south traffic flow through the City, for residents, visitors and business use. Ham Lane is considered a major arterial and vital link in the City's transportation/circulation system (CH2M Hill, 1978). The proposed improvement plans are consistent with the City's current Five-Year Capital Improvement Program. The project will meet projected traffic demands to the year 2005 and beyond at a Level of Service A. Existing traffic volumes along the project



Area map

Figure 1



Vicinity map

Figure 2

segment of Ham Lane range from 12,400 to 14,100 vehicles per day. (See traffic section of this report for further details of existing and future traffic projections.)

Project History

Ham Lane originally existed as a 50 foot county road from Lodi Avenue (Sargent Road) to Turner Road (county road). The first major residential subdivision in the project area was the Hutchins Homestead Addition #3 in 1938. Prior to the next major subdivision in 1950 (Fairmont Park, east side of Ham Lane, south of Elm), the City determined that the R/W width of Ham Lane should be 80 feet. Thus Fairmont Park and subsequent developments have dedicated an additional 15 feet on each side of Ham Lane. However, developers were not required to physically widen the existing street. This explains why the street is not centered in the right-of-way and why widening could occur over most of the project without the acquisition of additional right-of-way. The proposed project was presented before the City in 1978 but was rejected at that time due to public opposition.

Project Improvements

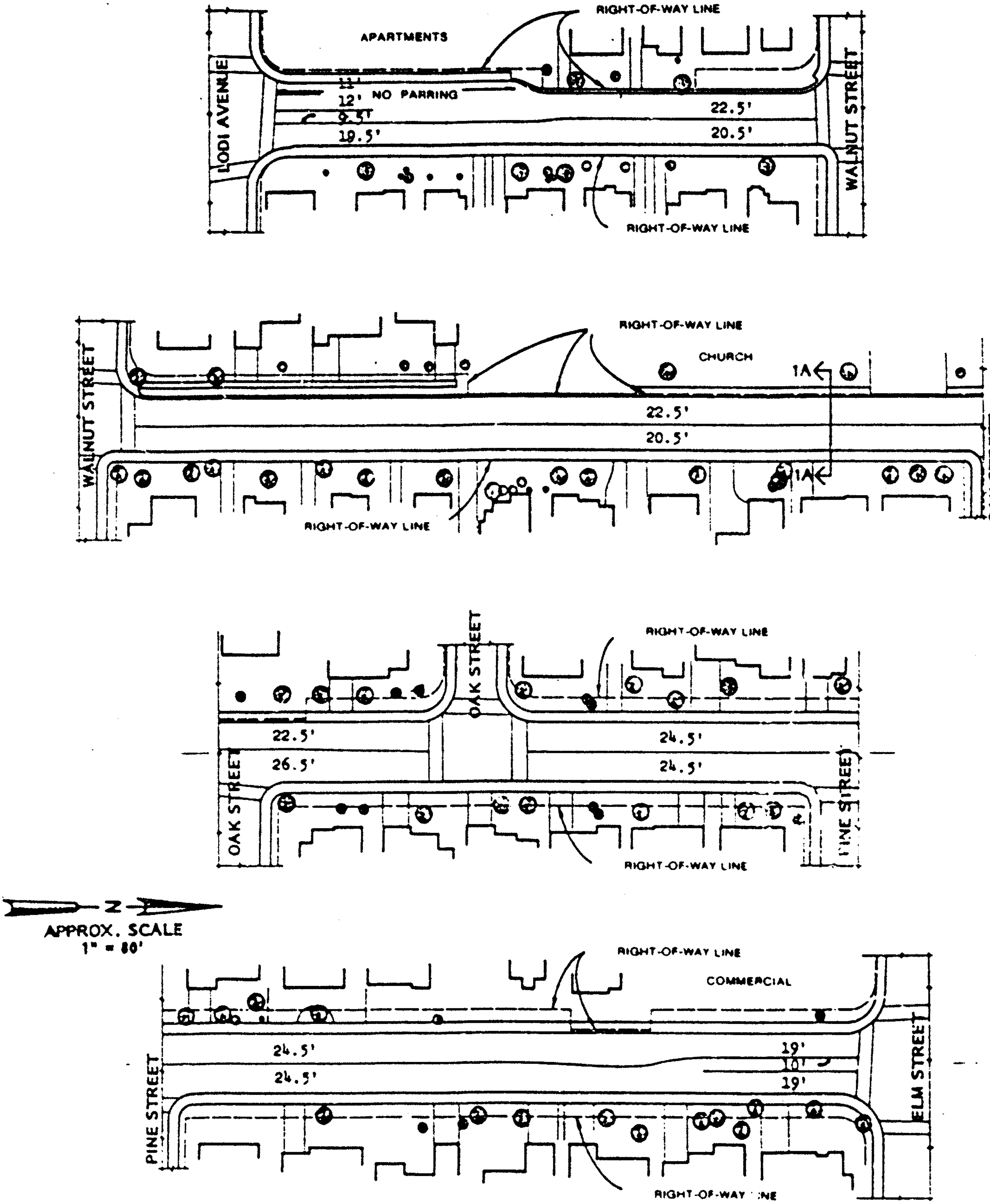
The proposed project will result in an 80-foot wide right-of-way along the project section of Ham Lane, with a developed 64-foot wide roadway. The existing curb-to-curb street width in this section of Ham Lane ranges between 44 and 50 feet. This portion of Ham Lane is currently striped for two traffic lanes and has crosswalks that are marked at the intersections. Figure 3 illustrates the existing Ham Lane roadway. An eight-phase traffic signal controls the Lodi Avenue and Ham Lane intersection and a four-phase traffic signal controls the Elm Street and Ham Lane intersection. Curbside parallel parking is allowed along both sides of Ham Lane between Lodi and Elm. The current on-street parking capacity is approximately 135 spaces (Clark, 1984).

Ham Lane, north and south of the project segment, has a curb-to-curb street width of 61.5 and 64 feet, respectively, and is striped for four traffic lanes and on-street parking, with left turn lanes and no parking at intersections.

The proposed project will result in four 12-foot wide traffic lanes and a combination of left-turn pocket lanes and on-street parking. Right-of-way easements will be acquired by the City as necessary. As part of the project, curbs and a 5-foot sidewalk on each side of the street will be constructed. Storm drains will be upgraded, fire hydrants and utility lines relocated, driveways reconstructed and pavements restriped. Project improvements are illustrated on Figures 3-1 through 3-5. A typical street cross-section is presented in Figure 4.

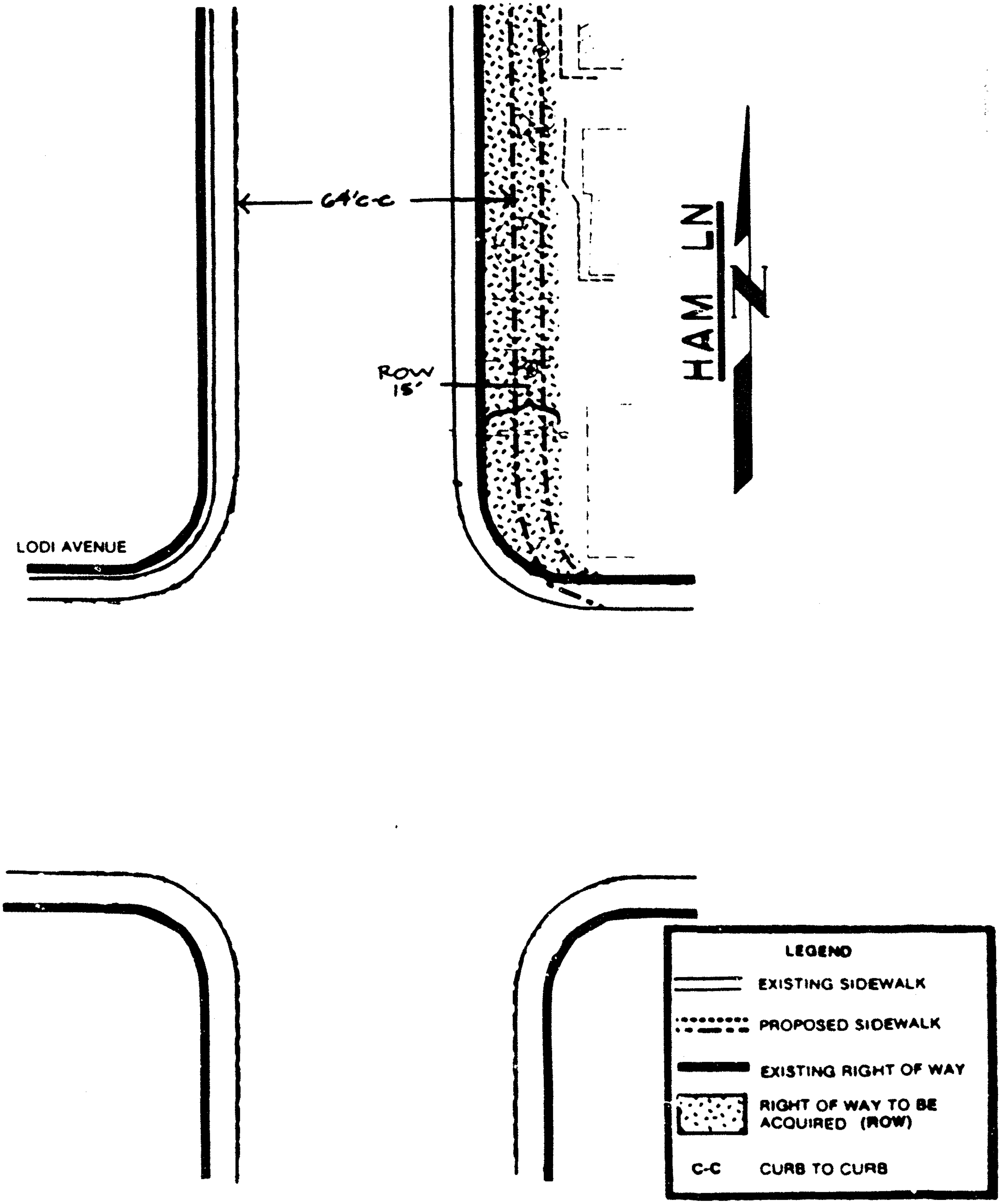
PERMIT REQUIREMENTS

As the lead agency, the City of Lodi is responsible for approving or disapproving the proposed project. The project is a City street and will not require permit approval from agencies other than the standard City department review. Relocation of utility lines will require approval by the pertinent utility companies (i.e., P.G. & E., Pacific Bell Telephone) according to their requirements.



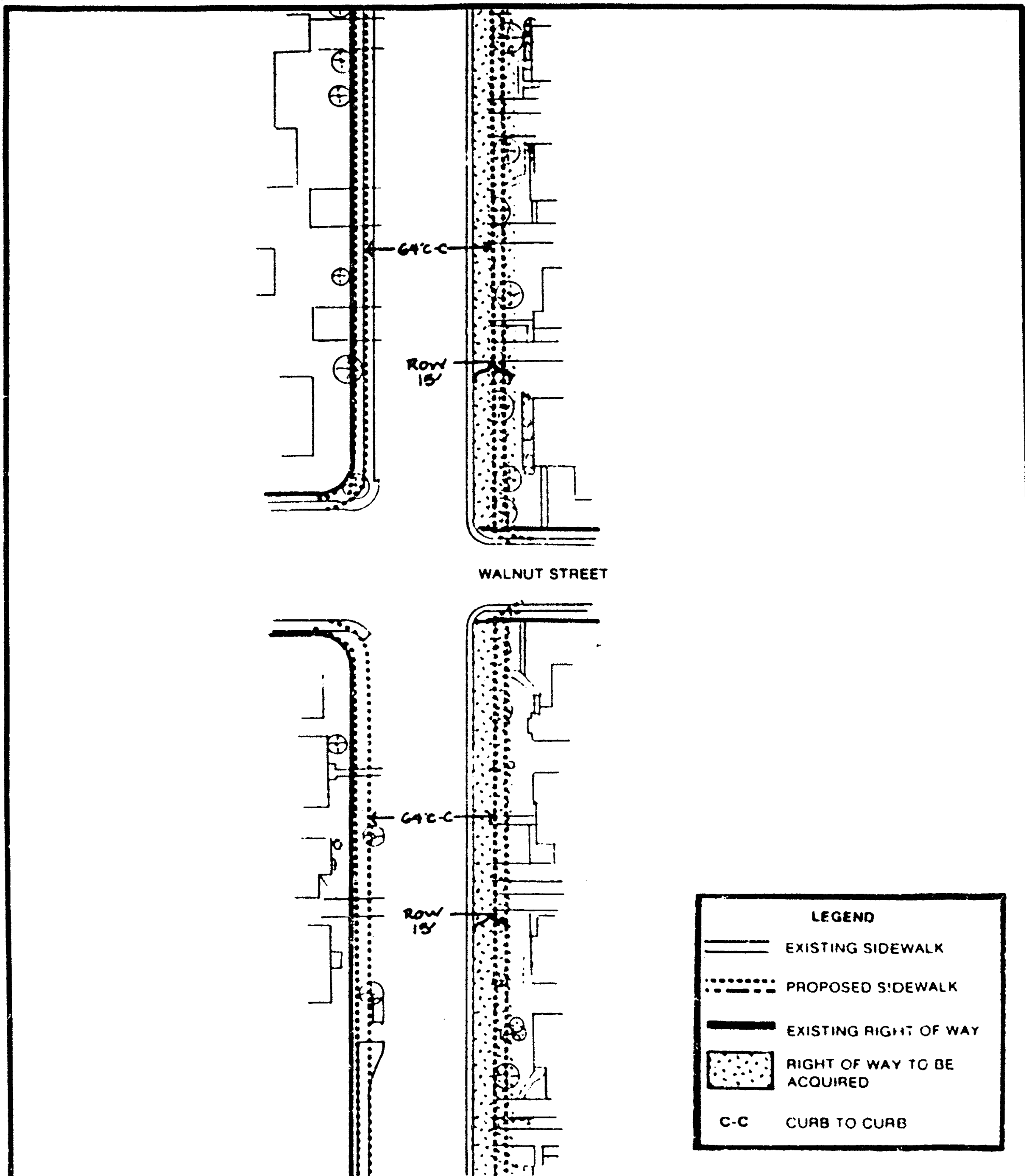
Existing Roadway

Figure 3



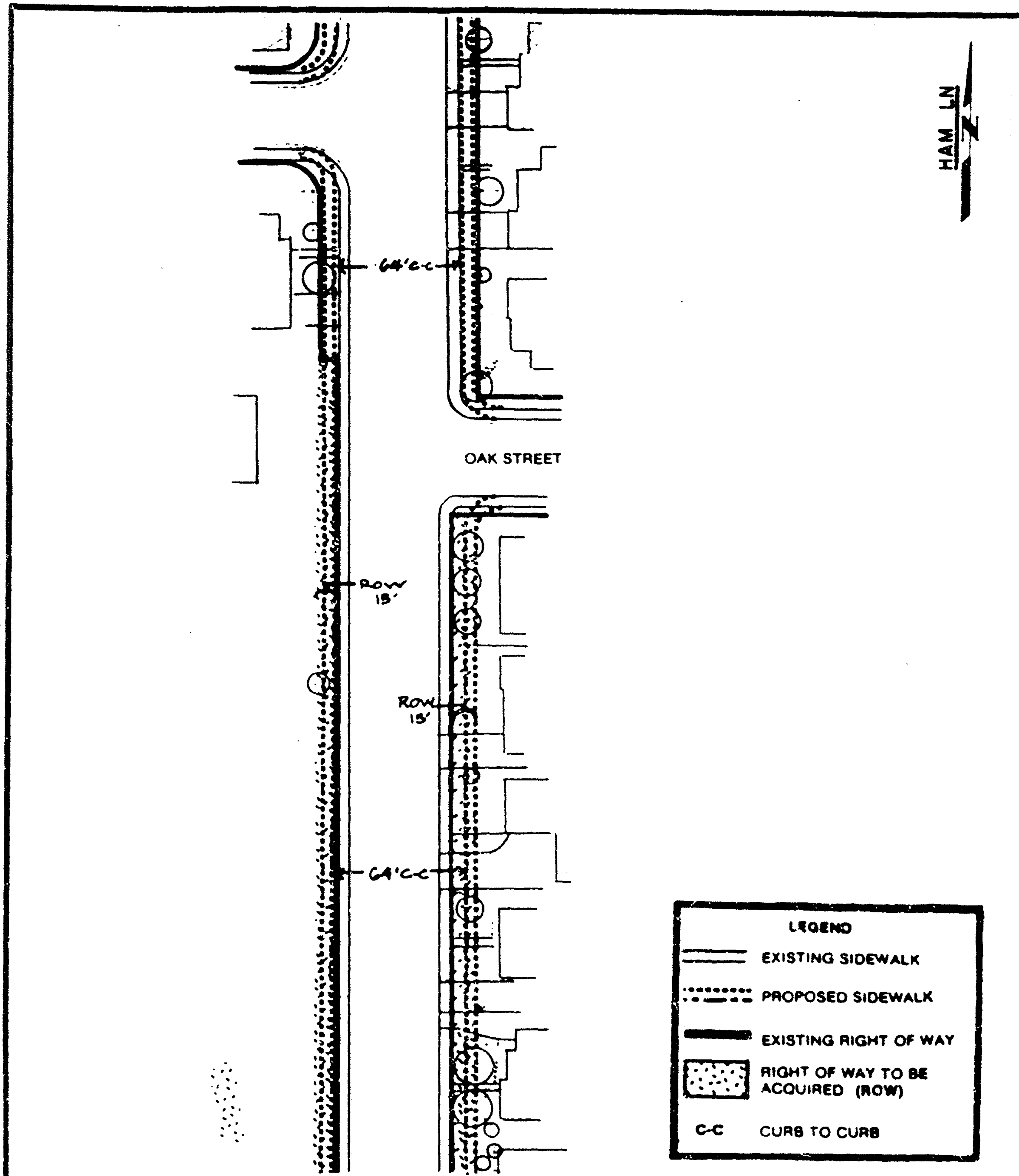
Ham Lane Improvement Plan

Figure 3-1



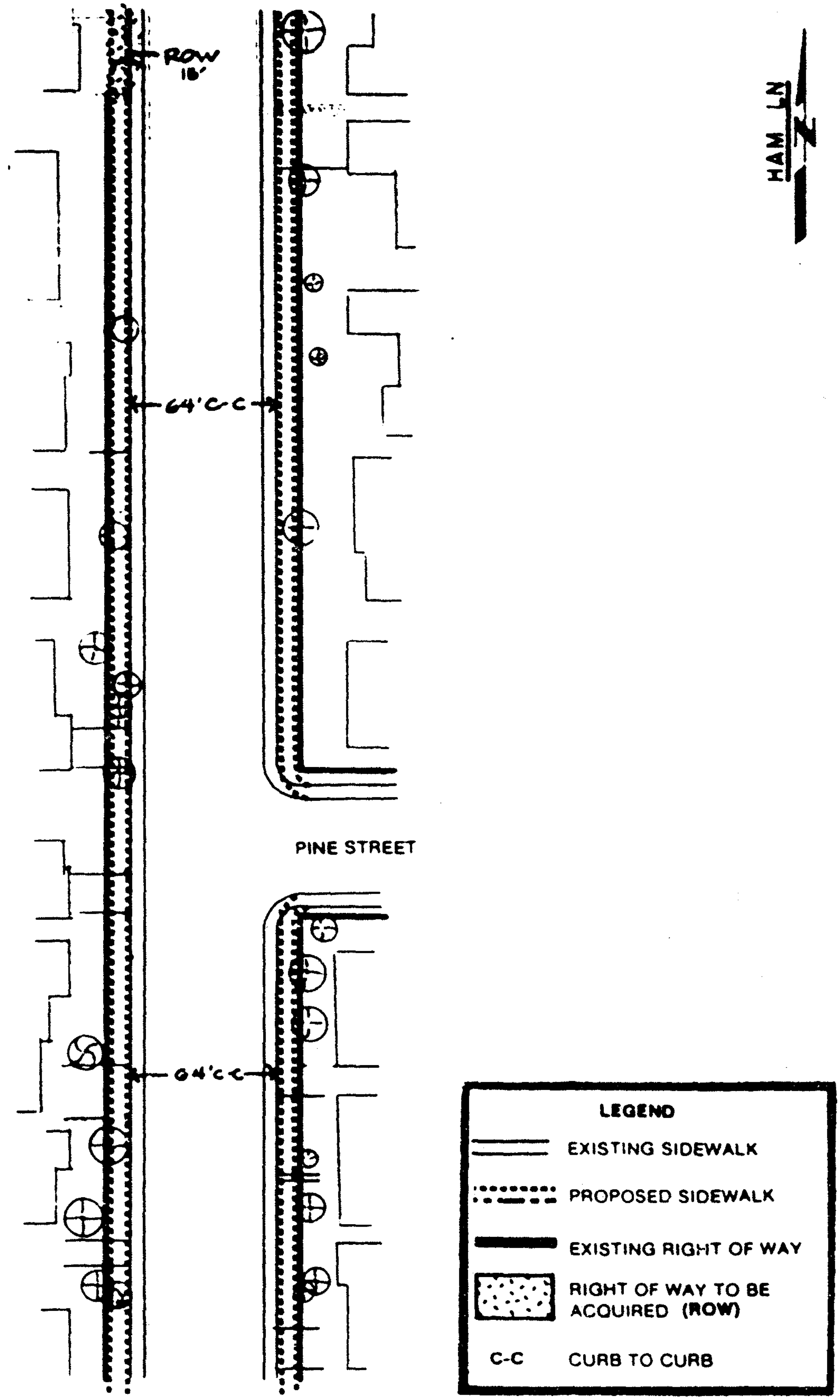
Ham Lane Improvement Plan

Figure 3-2



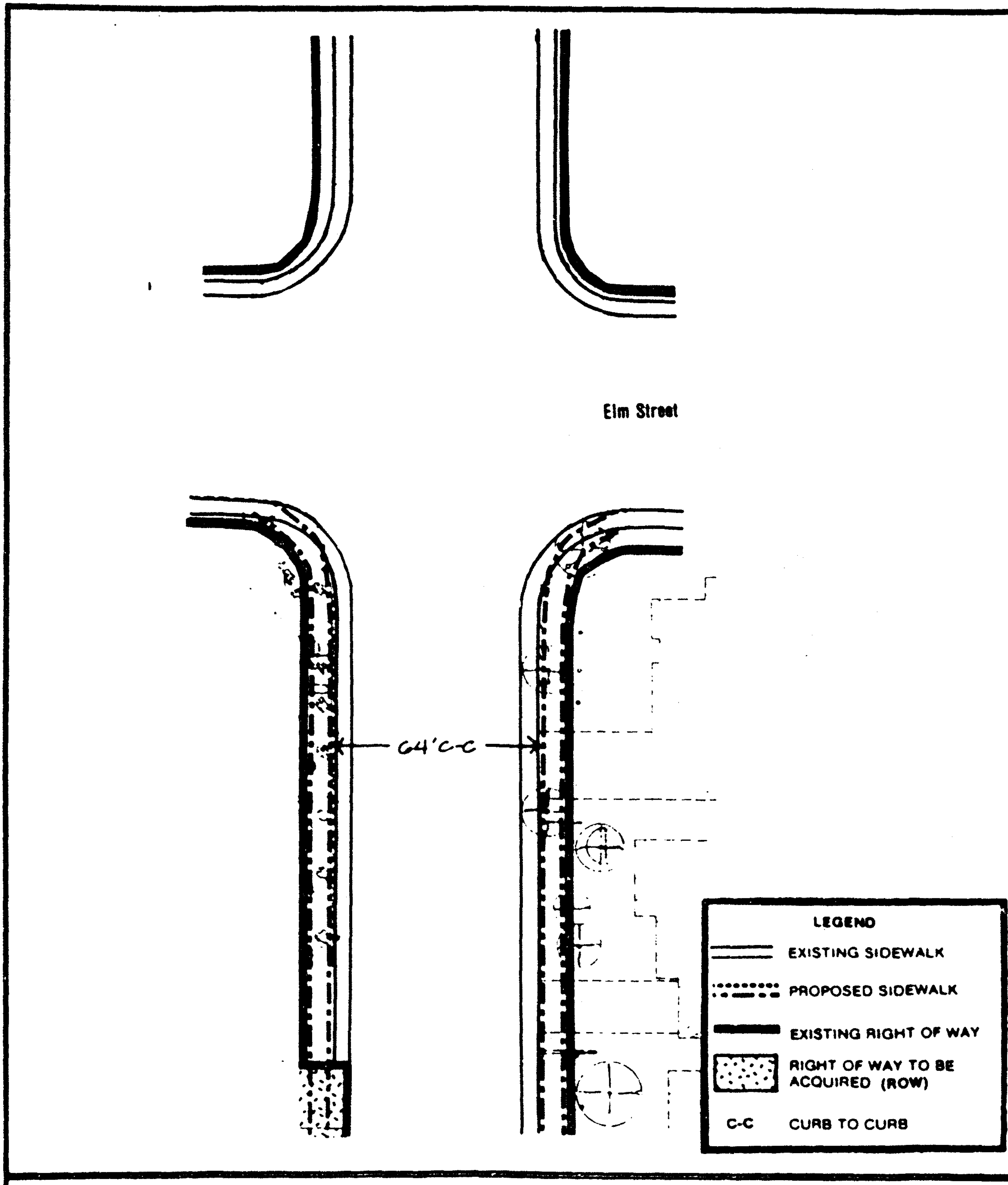
Ham Lane Improvement Plan

Figure 3-3



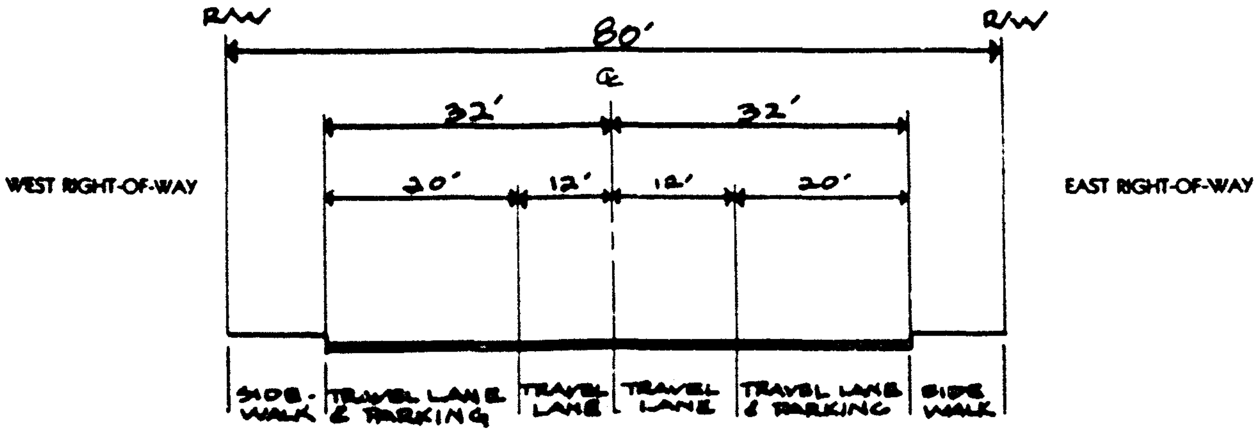
Ham Lane Improvement Plan

Figure 3-4

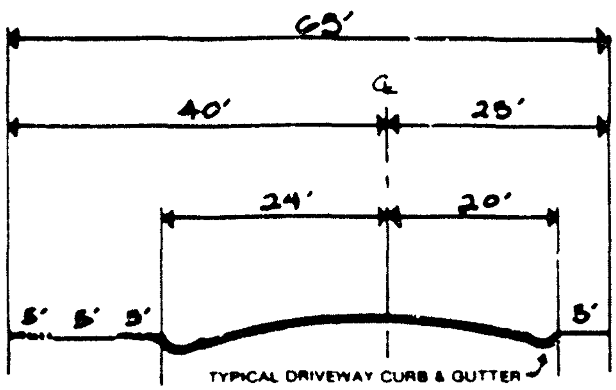


Ham Lane Improvement Plan

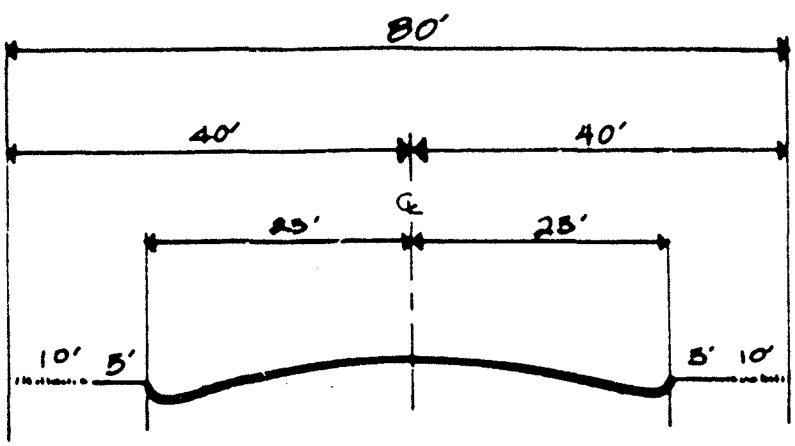
Figure 3-5



80' RIGHT-OF-WAY, 64' STREET



WALNUT



PINE

NOTE: ℄ IS A SECTION LINE AND NOT NECESSARILY THE CENTER LINE OF EXISTING ROADWAY.

Ham Lane Section PROPOSED & EXISTING

Typical Mid Block

Figure 4

Environmental Setting, Impacts and Mitigations

EXISTING CONDITIONS

The project segment of Ham Lane is primarily in single-family residential use. An apartment building, nursery, church and veterinary hospital are also found in the project area. Landscaping typically found in developed residential areas is found along this portion of Ham Lane. There are no threatened or endangered plant or animal species found in this area.

The project section of Ham Lane is one of the older residential areas of the City. As would be expected, there are numerous large, mature trees, as well as smaller trees, shrubs, lawns and typical residential landscaping planted in the front yards of the existing homes. It is estimated that there are nearly 100 mature evergreen and deciduous trees found in this area. There is no single dominant species, but a combination of ash, maple, birch, cedar, spruce, juniper and pine are found. Location of existing trees is shown in Figure 5. Project plans call for the removal of all trees and landscaping within the proposed 80-foot wide right-of-way.

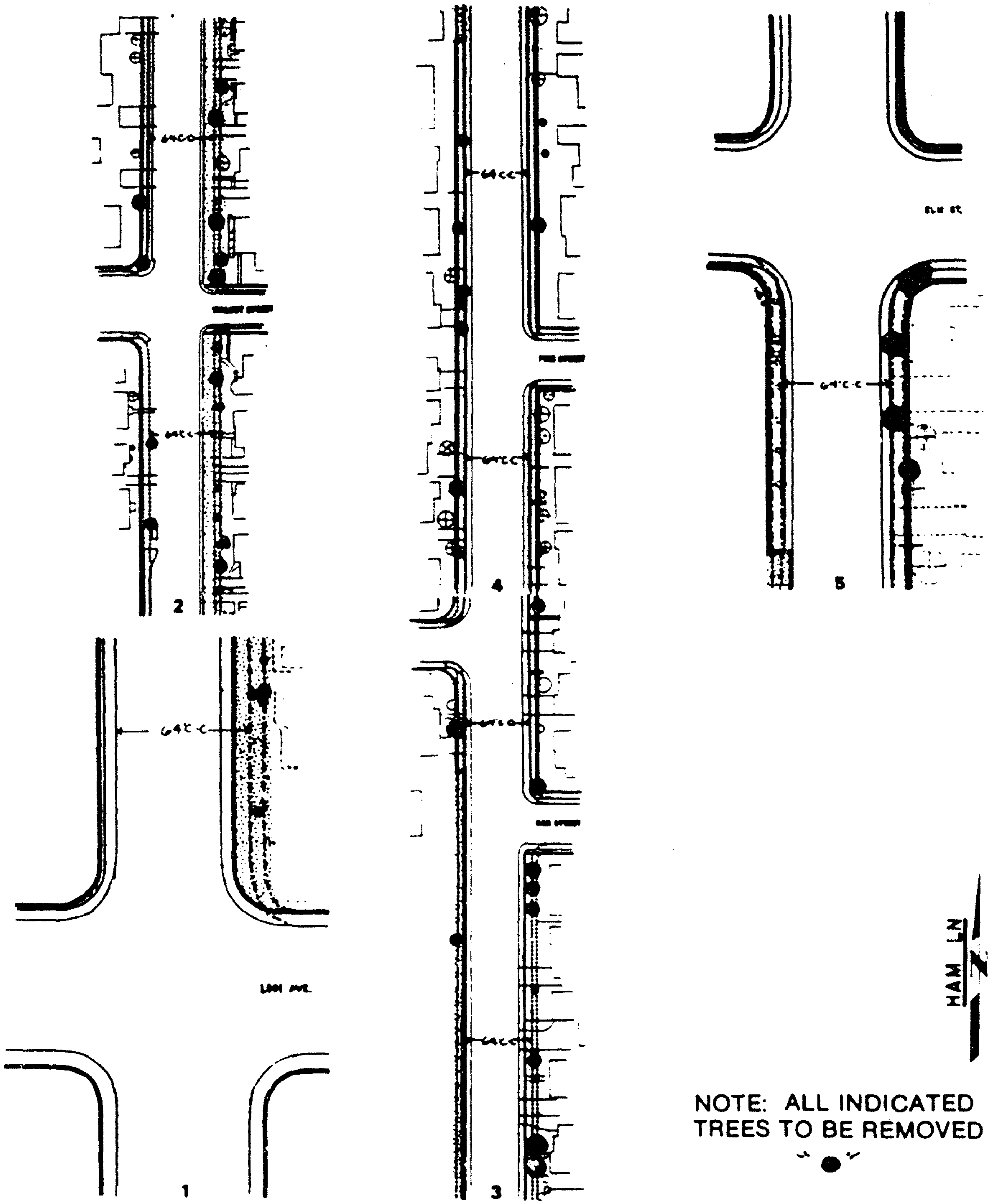
The issue of concern in this section is the loss of street trees due to the widening of Ham Lane. The presence of these mature, large trees serve several functions. They establish a residential character of the neighborhood and a pleasant visual quality to the street. They also provide shade and enhance a sense of privacy to existing residences. Wildlife is not an issue in this EIR because the project is located within an urbanized area.

IMPACTS AND MITIGATION MEASURES

Impact: Loss of street trees and landscaping.

Approximately 30 mature trees, 20 immature trees and various shrubs and landscaping would be lost due to project implementation. This would result in a change in visual and neighborhood quality of the project area, as well as a loss of shade, with potential increases in summer temperatures to area residences.

A field survey was conducted as part of this report to determine the number and type of trees that will be removed. This report is contained in Appendix A, and identifies the species that will be removed on each side of Ham Lane for each block. More major trees will be removed on the east side of Ham Lane than on the west. Approximately 20 mature trees will be removed on the east side of Ham Lane compared to about 10 mature trees that will be lost on the west side. About 20 younger, smaller trees will be removed on the east side and 32 on the west side. The majority of immature trees and shrubs to be removed on the west side are those adjacent to the existing nursery. In addition, approximately 10 feet of lawn and landscaping will be lost as a result of the roadway widening.



Tree Removal Area
Proposed Project

Figure 5

Mitigations

1. Where feasible, retain existing trees within the 80-foot right-of-way, but outside the 75-foot developed area. Where mature trees stand on or just within the developed right-of-way, adjust the sidewalk alignment to accommodate saving the tree. It is estimated that sidewalk readjustment could save approximately 15 trees. This could also entail additional R/W acquisition.

2. Replant Ham Lane with the same or similar number and type of species as those removed. In order to maintain the character of the neighborhood as provided by the existing landscaping, it is suggested that a landscaping plan be prepared to insure that the number, type, location and spacing of trees is consistent with current plantings wherever possible.

   Appendix A presents a list of recommended tree and shrub species that could be used for planting. This list will affect the ultimate landscaping plan. It is suggested the Raywood or Moraine Ash be substituted for Modesto Ash, as they are more disease-resistant (Olive, 1984). Replanting could occur in box planters, but space considerations may limit the size of trees that can be replanted due to the limited space available for root growth. It is suggested that large trees (50 to 70 feet tall) be planted 15 to 20 feet away from a dwelling, and that medium trees (35 to 50 feet tall) be planted 10 to 15 feet away from a dwelling. Medium size trees planted close to the sidewalk could be planted in deep-well containers to force the roots down. Immature trees and shrubs within the developed right-of-way should be transplanted within the undeveloped right-of-way whenever possible.

   OR

3. Redesign project according to Alternative B as discussed in the Alternatives section of this report. This would serve to retain most trees on the east side of the street because the developed roadway would be 56 feet wide, with a 72-foot right-of-way.

Impact: Slight potential for root disturbance of existing trees due to project construction.

As a result of sidewalk construction, there is a slight potential for root disturbance to trees that are not removed. However, while there may be some root damage, it does not appear that this will be significant due to the location and type of trees involved. Typically, 4.5 feet from the sidewalk to the tree trunk is a safe distance to prevent root damage (Olive, Personal Communication, 1984). It is estimated that sidewalk construction will cause excavation to about 12 inches, depending on existing ground elevation.

Mitigation

4. Exercise caution during sidewalk construction to minimize potential root disturbance whenever possible.

EXISTING CONDITIONS

Ham Lane is one of the major north-south streets serving the City of Lodi. Ham Lane terminates at Turner Road at its north end and at Harney Lane at its south end. The proposed improvement project would affect a four-block segment of Ham Lane ~~in the~~ [between] Lodi ~~to Oak block~~ [and Elm].

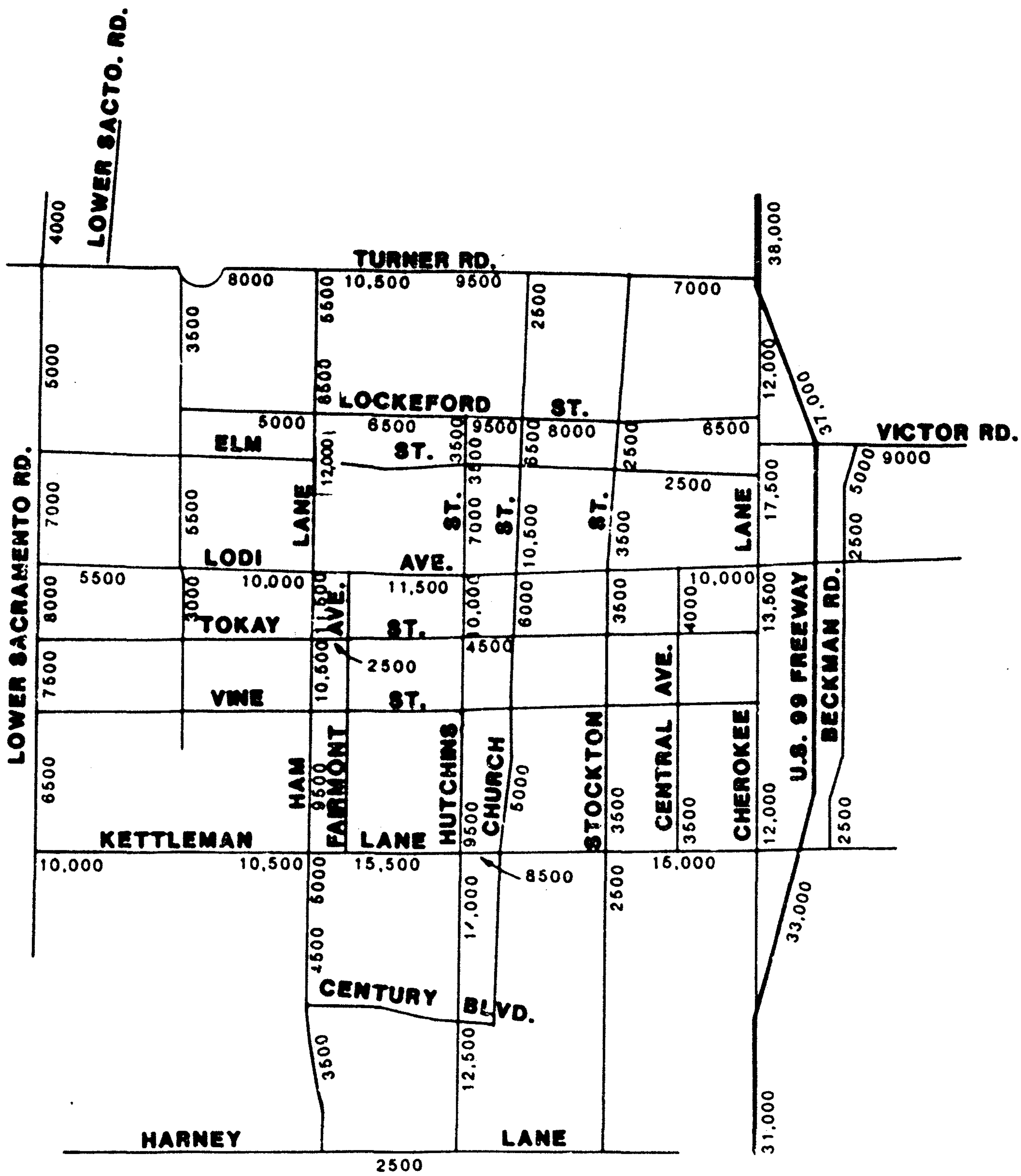
This segment is characterized by right-of-ways (R/W) varying from 50 to 65 and from 65 to 80 feet and by developed street widths of 44 to 50 feet. The street is not centered within the R/W. The narrowest developed width occurs in the Lodi to ~~Walnut~~ [Oak] block.

Ham Lane between Lodi Avenue and Elm Street is currently striped with two travel lanes. Intersections are marked with crosswalks and are controlled by stop lights at the Lodi Avenue and Elm Street intersections. The Walnut and Oak and Pine Street intersections are not signalized. Curbside parking is allowed on-street along both sides of Ham Lane from Lodi Avenue to Elm Street. The current on-street parking capacity is approximately 135 spaces.

The current traffic volumes along the project segment range between 12,400 to 14,100 ADT. Peak hour (7:00-9:00 A.M.; 4:00-6:00 P.M.) volumes are 660-940 and 1,050-1,120. Critical intersection approach movements at Ham/Lodi are 515 vehicles, while peak hour movements at Ham/Elm are 650 vehicles. ~~The capacity of Ham Lane at the critical Ham/Lodi intersection is A~~. (See Figure 6.) Based on this data, the levels of service (LOS) at both the Lodi and Elm Street intersections is LOS A (see Table 1 for a definition of the various levels of service). However, it must be noted that during certain periods of the day, specifically when high school gets out at Lodi High, the southbound approach to the Ham and Lodi intersection experiences periods of congestion. Cycle failures and blockage of various intersection approach lanes are common occurrences. Southbound vehicles wishing to turn left onto Lodi Avenue ~~queue~~ [back] up and block access to the southbound Ham Lane throughlanes. These occurrences are short in duration and are difficult to quantify. For this reason, and because of limitations of analysis methodologies, the calculation of the level of service for these occurrences was not attempted. Current analysis methodologies are limited to calculating the LOS for an intersection using intersection approach volumes summed over a one-hour period. Thus, the peaks are averaged out during the analysis hour.

Land uses along the Ham Lane corridor consist primarily of residential development varying from single family to multiple family. There is some commercial development near Elm Street. Lodi High School, with access to Ham Lane on the west side of the study section, has a distinct influence on Ham Lane traffic flows. During the 11:00-3:00 P.M. hours, traffic volumes are very high in the southbound direction (570 VPH).

Table 2 presents a summary of existing conditions along Ham Lane from Lodi Avenue to Elm Street.



Average Daily Traffic Volumes

(1980-1981)

Figure 6

Table 1

LEVEL OF SERVICE DEFINITIONS

Level of Service	Traffic Flow Characteristics
A	Average overall travel speed of 30 mph or more. Freeflowing with no congestion. No signal cycle failures.
B	Average overall travel speed of 25-30 mph. Very few signal cycle failures and little or no congestion.
C	Average overall travel speed of 20-25 mph. Occasional signal cycle failures and moderate amount of congestion.
D	Average overall travel speed of 15-20 mph. Frequent signal cycle failures and associated congestion.
E	Average overall travel speed of about 15 mph. Unstable flow which includes almost continuous signal cycle failures and backups on approaches to the intersections. This represents the theoretical capacity of the facility.
F	Forced flow, with average overall travel speed of below 15 mph. Continuous signal cycle failure with backup on approaches going through upstream intersections in some cases.

FUTURE TRAFFIC VOLUMES

In order to properly evaluate the proposed project (and other suggested design options) future traffic volumes were calculated. The volumes were calculated in five-year increments (1990-2005) based on minimum and maximum values.

The minimum values are based on historic population and traffic volume growth for the City of Lodi (1965-1984). The maximum range was calculated using the historic growth rate in traffic volumes on Ham Lane itself (1965-1984).

Table 3, Future Traffic Projections, presents the results of these calculations.

Table 2

Summary of Existing Street Conditions

Ham Lane: Lodi to Elm

Physical Conditions						Traffic Conditions			
Land Uses West Side	 East Side	R.O.W. (feet)	Striping	Control Devices	Parking	Two-Way Volume (ADT + VPH)	Capacities	Level of Service (LOS)	On-Street Parking Spaces (Approx.)
Single Family Older Apts. Near Lodi Avenue Commercial (Animal Hospital and Nursery) Near Elm	Single Family Homes	50 to 65 to ~~85~~ 80	Two Lanes	Eight-Phase Traffic Signal at Lodi Four-Phase Traffic Signal at Elm	On-Street Parking Permitted (Parallel Curbside)	12,400 AM 660 PM 1,050 Near Elm 14,100 AM 940 PM 1,120 Near Lodi		Lodi at Ham LOS A Elm at Ham LOS A	62 West 73 East

Table 3

Future Traffic Projections Ham Lane

Segment	1984 ADT	1984 PM Peak	1984 One Way Peak	1990 ADT	1990 PM Peak	1990 One Way Peak	1995 ADT	1995 PM Peak	1995 One Way Peak	2000 ADT	2000 PM Peak	2000 One Way Peak	2005 ADT	2005 PM Peak	2005 One Way Peak
Minimum Alternative															
Lodi to Pine	14,100	1,120	580	15,200	1,220	620	16,500	1,320	670	17,900	1,430	730	19,400	1,550	790
Pine to Elm	12,400	1,050	570	13,500	1,150	610	14,600	1,240	660	15,900	1,350	720	18,400	1,560	830
Maximum Alternative															
Lodi to Pine	14,100	1,120	580	17,100	1,360	710	19,100	1,520	790	21,100	1,760	910	23,100	1,920	990
Pine to Elm	12,400	1,050	570	14,100	1,200	650	15,700	1,330	720	17,400	1,480	800	19,100	1,620	870

Note: **Medium Alternative:** City Wide Growth Rate 1.7% per Year

High Alternative: Lodi to Pine Growth Rate (Historic)
Pine to Elm Growth Rate (Historic)

IMPACTS AND MITIGATIONS

Impact: Decrease in existing and long-range traffic congestion.

Construction of the project as proposed would result in a decrease in existing traffic congestion. In addition, future traffic volumes into the foreseeable future (2005+) would be accommodated by the project. The current irregularities in street width would be eliminated, unsafe intersections would be improved and levels of service would remain high throughout the project life.

Mitigation

5. None required.

Impact: Decrease in pedestrian safety.

Due to an estimated increase in traffic speeds, higher volumes and greater distances to cross, pedestrians will have to wait longer for adequate gaps in traffic to make a safe crossing. School children and senior citizens are the most affected pedestrians. Area residents have indicated that simple crosswalk controls do not appear to facilitate street crossings.

Mitigation

6. Additional pedestrian safety devices may be needed which would include additional crosswalks, roadway warning signs, traffic guards and if necessary, traffic or pedestrian signals.

Impact: Potential delays to cross traffic.

Because of higher traffic volumes and more lanes to negotiate, cars on the side streets may have to wait longer to find a safe gap i traffic, thus causing more delay on these intersecting streets.

Mitigation

7. Traffic signals will be installed as traffic signal warrants are met. This would give the right-of-way to the vehicles on the side streets so they could make the desired traffic movements.

Impact: Potential for increased vehicle speeds.

Because drivers may perceive the road to be safer to drive at higher speeds, overall vehicle speeds may increase.

Mitigation

8. Speed limit signs, with strict enforcement by the local police, can help to reduce speeds. However, even these measures may not be entirely successful.

Impact: Decreased on-street parking.

The improvement of the intersections will result in the loss of some on-street parking. This will inconvenience residents living adjacent to the restricted area and create increased demand for adjacent spaces.

Mitigation

9. Provide all future developments have adequate off-street parking.

EXISTING CONDITIONS

The primary source of noise in the project area is traffic noise, both on Ham Lane and on major cross streets such as Lodi Avenue and Elm Street. Traffic noise along this stretch of roadway is of several types: noise levels resulting from passenger vehicles traveling at moderate speeds during peak hours; noise levels resulting from passenger vehicles traveling at reduced speeds during peak hours; passenger vehicles traveling at excessive speeds during any hour; and heavy trucks, motorcycles, buses and/or vehicles with faulty muffler systems traveling at moderate speeds during any hour. Other sources of noise in the area (overflying aircraft, barking dogs and similar urban disturbances) are present but do not contribute significantly to overall noise levels.

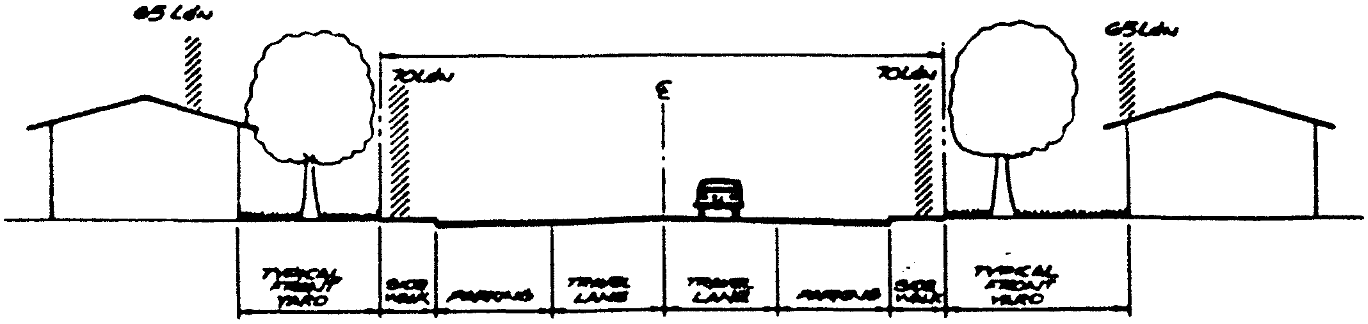
Background noise levels (i.e., noise levels generated by all the City activities throughout the area) are not high in this area. In other words, without the vehicular traffic along Ham Lane there are no adjacent noise sources of a constant level such as factories, industrial activities, processing, etc. The Southern Pacific railroad tracks and Route 99 traffic do contribute to background noise levels and are noticeable in the absence of noise from nearby sources (see Appendix C).

Ambient Noise Levels

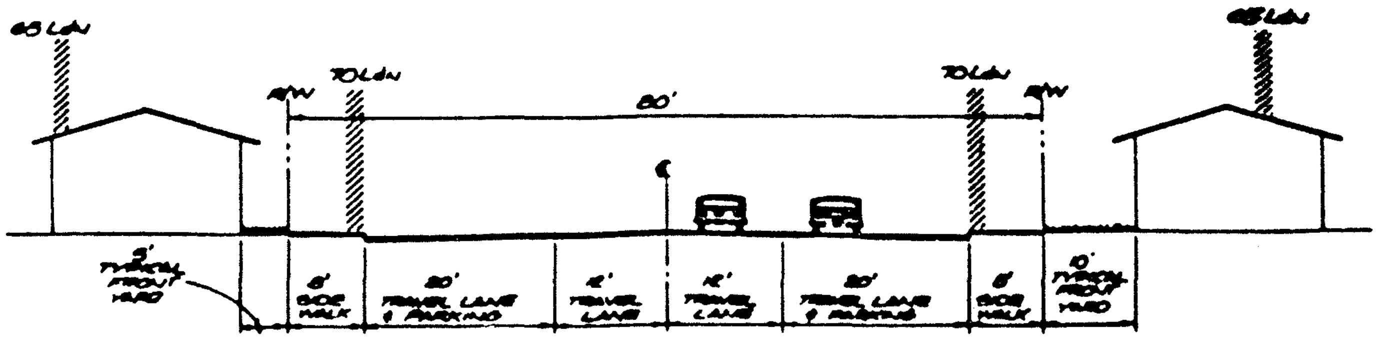
The traffic noise level at a given location is a combination of many factors, including the traffic volume, the noise level of each vehicle, vehicle speed, and the distance to the road. As most urban dwellers are aware, the traffic noise level near a busy street varies over a wide range. To indicate easily the overall noise level, single number descriptors are usually used. The most common descriptor for a short period is the hourly L_{eq}, which indicates the energy average of the varying noise level, and has been shown to be a good indicator of people's perceptions of noise level. Over a longer period, the L_{dn} descriptor is used, which is the long-term average of L_{eq}, with 10 dB added to the noise level for the nighttime period.

With basic information about local traffic, the roadside noise level can be modeled (computed) fairly accurately using equations that have been developed from field tests. The standard Highway Research Board traffic noise model, revised after extensive field measurements, has been used for this study. Roadside noise levels are estimated in Table 4 for existing traffic on Ham Lane, at 40 feet from the center of the street (approximately the middle of the average yard).

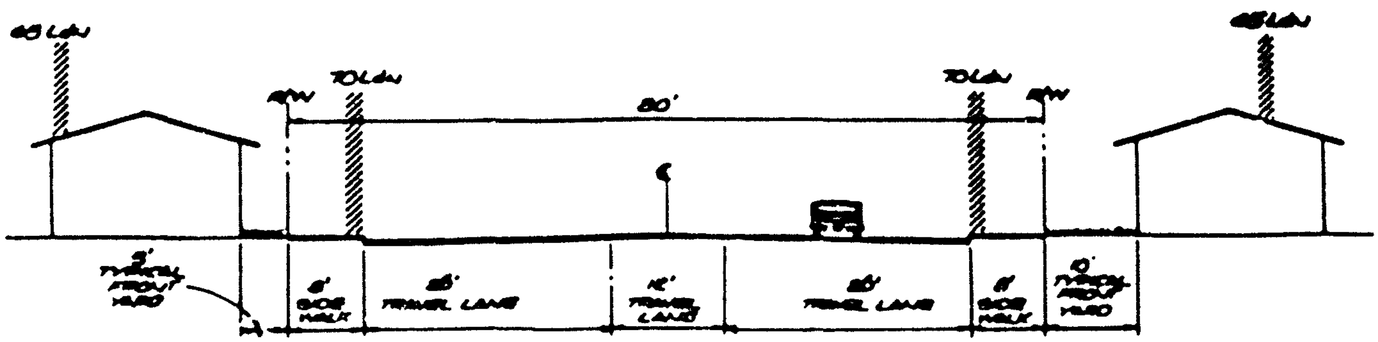
Peak passby noise levels on Ham Lane for passenger vehicles traveling at moderate speeds are approximately 60 to 70 dBA at a distance of 25 feet. Heavy trucks, motorcycles, buses and vehicles with faulty mufflers produce peak passby noise levels of 70 to 90 dBA at twenty-five feet. (See Figure 7.)



TYPICAL SECTION 1
FUTURE NOISE LEVELS
WITHOUT THE PROJECT



TYPICAL SECTION 2
FUTURE NOISE LEVELS
WITH THE PROJECT



TYPICAL SECTION 3
FUTURE NOISE LEVELS
WITH THE PROJECT
AT MAJOR INTERSECTIONS

Noise Levels

Figure 7

Table 4
Present Ham Lane Noise Levels (dBA)

Location	Peak Hour	L_{eq} Noon	1:00 A.M.	L_{dn}
Front Yards	71	70	58	72

These noise levels are based upon an Average Daily Traffic (ADT) volume of 12,500 and a peak hour volume of 1,050 trips. The noise levels during periods other than the peak hour, and the L_{dn}, are based upon typical hourly variations of urban traffic throughout a normal day. Because of the relatively small front yards and the reflection of noise from the houses, the noise levels are not substantially different at the houses than at the sidewalk (1-2 dBA less).

The City of Lodi has adopted the San Joaquin County Noise Element (Reference 5), which recommends compatible uses for various noise levels. The suggested L_{dn} noise levels for residential land uses are outlined in Table 5.

Table 5
Recommended Noise Levels for Residential Use

Land Use Category	L_{dn} Range
Normally Acceptable	Less than 60 dBA
Conditionally Acceptable	55 to 70
Normally Unacceptable	70 to 75
Clearly Unacceptable	Above 75

The guidelines are intended to assist in decisions about new residential construction, but they are useful in evaluating existing uses also. In terms of Noise Element guidelines, present noise levels adjacent to Ham Lane already exceed recommendations (see Appendix C).

Sensitive Receptors

The majority of properties adjacent to Ham Lane between Lodi Avenue and Elm Street are residential. Most of the residences are single family but there are also several duplexes and apartments. Commercial uses are located at Ham Lane and Elm Street and the Zion Reformed Church is located between Oak and Walnut Streets.

At a meeting on August 23, 1984, residents in the area indicated that vehicular noise levels along the street are already causing disturbances and irritation. Vibration, peak hour volumes and high school traffic were all cited as irritants. As indicated above, suggested standards for residential uses are already being exceeded.

IMPACTS AND MITIGATIONS

Impact: Increase in vehicular noise.

In order to quantify future noise levels resulting from the proposed project, the projected maximum traffic generation figures for four future dates and three possible options were used. The future vehicle speeds were projected to further refine the future noise potentials. Then the information was fed into a computer model which projected future noise levels 40 feet from the centerline (approximately the middle of the current average yard) for the alternatives. The results of this modeling are shown below:

Table 6

Projected Noise Levels (dBA)

Case	Vehicle Speed Peak	Vehicle Speed Other	L_{eq}	L_{dn}	Standard* Acceptable Range	Standard* Unacceptable Range	Reason for Increase
1995--4 lane 2 parking	30	35	73	74	60-70	70+	Increased Volumes
2005--4 lane 2 parking	30	35	74	76	60-70	70+	Increased Volumes
2005--4 lane 1 turn	30	35	76	77	60-70	70+	Increased Volumes
2005--2 lane (existing)	20	25	69	71	60-70	70+	Increased Congestion

*for residential uses, using L_{dn} measurement.

Table 6 demonstrates the relative effects of traffic volume, average vehicle speed and distance from the source on the noise level, when compared to present noise levels. The cases modeled do not include all possible combinations of volumes and lane configurations. However, the cases which have the highest noise potential are included. If the high-growth traffic projections do not occur, lower noise levels would be generated. (See Appendix C.)

It should also be noted that receptors not on Ham Lane, behind those directly facing the project, are exposed to 14-18 dBA less noise because of the combination of greater distance and the partial shielding provided by the buildings. The changes in project traffic noise for other receptor locations would be approximately the same as for those located on Ham Lane. However, Ham Lane traffic is not a dominant source of noise for receptors on other streets.

Two aspects are important when considering potential noise impacts of a project: the increase in noise level due to the project, and the project noise level itself.

From Table 6, traffic noise along Ham Lane could increase 3 to 5 dBA in the next 20 years with project implementation. In general, noise increases of 2 dBA or less usuually are not noticeable, unless the character of the noise is also changed significantly. Noise increases of 3 to 5 dBA ae definitely noticeable, and are potentially disturbing. The character of the noise is again important in the amount of disturbance caused. In the Ham Lane case, a 5 dBA increase in steady traffic noise over 20 years might not cause problems (it is typical in many urban locations). However, an increase in individual loud vehicles could cause considerable disturbance.

To evaluate the potential impact because of the overall noise level, land use planning guidelines for noise are used. As previously indicatd, the City-adopted noise standards are currently exceeded. Implementation of the project would increase those levels 2 to 5 dBA. In addition, acceptable interior noise levels should be less than 45 dBA L_{dn} due to exterior sources. This requirement is contained in State Title 25--Section 1092, Noise Insulation Standards, which apply to any new multi-family residential construction.

Standard residential building design and construction methods generally reduce outdoor noise by 20 to 25 dBA, with windows closed and no significant cracks or openings around windows or doors. With the best residential construction methods, and traffic noise levels of 70 dBA, Ham Lane interior noise levels would meet 45 dBA (L_{dn}) indoor standards. However, if windows are opened, interior noise levels will be only 10 to 15 dBA less than outdoors.

Mitigations

10. Construction of a low masonry barrier (2 to 2.5 feet high) along the front of residential properties was evaluated. However, the resulting 1-2 dBA reduction in noise levels would not be perceived as a noticeable reduction.

To achieve a 45 dBA interior noise environment, windows should be sealed, and forced ventilation provided. To deal with noise levels higher than 70 dBA, other improvements to the structures could be needed.

11. Although often undesirable for traffic engineering reasons, reducing average speeds on Ham Lane would reduce noise levels effectively.

12. Reduce local traffic volumes by improving desirability of alternatives to the automobile, such as car pools, bicycles and public transit.

13. Enforce California Vehicle Code prohibitions against faulty or modified loud exhaust systems--Sections 27150 and 27151. This can be implemented by local law officers without noise monitoring equipment to eliminate the worst offenders.

14. Implement an alternative which reduces the distance between affected properties and the travel lanes.

Impact: Temporary increase in construction noise.

The residential properties along Ham Lane would be the primary receptors for the temporary construction noise. For a period of four to eight weeks, sporadic noise levels of 80 to 90 dBA would be experienced. Although construction equipment would be idling part of the time, and would be producing maximum noise levels infrequently, intermittent construction noise disturbance is likely on all adjacent properties.

The initial site preparation phases would bring various types of demolition and excavation machines to the site, such as bulldozers, backhoes and large dump trucks. These generally have diesel engines and produce 80 to 90 dBA at a distance of 50 feet under full load. Jackhammers would be utilized for concrete and backtop removal which generate 85 to 90 dBA noise levels at 50 feet.

Second phase activities require similar equipment and produce similar noise levels. After removal of the existing road surface, curbs and sidewalks, the suface would be graded. Trucks would bring in the base materials to graded and rolled. Blacktop trucks and concrete mixing trucks bring the top surface materials. Final surface preparation by large rollers produces noise levels of 85 to °5 dBA at 50 feet.

Mitigations

15. Choose construction equipment which is of quiet design, has a high quality muffler system and is well maintained.

16. Install superior mufflers and engine enclosure panels when required on gas, diesel or pneumatic impact machines.

17. Restrict hours of use for motorized equipment--for example, 7:30 A.M. to 5:30 P.M., Monday through Friday.

EXISTING CONDITIONS

Regional Climate

The Mediterranean type climate of the San Joaquin Valley is characterized by mild and rainy winters and hot and nearly dry summers. There is a high percentage of sunshine. Appendix D presents details on local climate.

Ambient Air Quality

The air quality of a given area is not only dependent upon the amount of air pollutants emitted locally or within the air basin, but also is directly related to the weather patterns of the region. The wind speed and direction, the temperature profile of the atmosphere and the amount of humidity and sunlight determine the fate of the emitted pollutants each day, and determine the resulting concentrations of air pollutants defining the "air quality."

Air quality in Lodi and the San Joaquin Valley is subject to the problems experienced by many areas of California. Emissions from millions of vehicle-miles of travel each day often are not mixed and diluuted but are trapped near ground level by a temperature inversion. Pollutant concentrations are a result of local emissions in Lodi and also the transport of pollutants from other areas such as Stockton, Sacramento and even the Bay Area (with westerly winds). These sources produce concentrations which sometimes exceed ambient air quality limits established by the state Air Resources Board. Recent air quality data from the nearest ARB monitoring stations, Ham Lane in Lodi and Hazelton Street in Stockton, are tabulated in Table 7.

Ozone, the primary oxidant "smog" component, is produced by complex reactions of hydrocarbons and NO_x in the atmosphere. Both vehicles and the use of organic chemicals produce emissions which drive the chemcial reaction. Daily ozone concentrations are heavily dependent upon the weather and atmospheric stability, and thus vary substantially from year to year. Adverse atmospheric conditions in 1980 produced 78 exceedances of the 10 ppm hourly standard in Lodi, and over two dozen ozone exceedances were still recorded in 1981 and 1982.

Carbon monoxide, like oxidant, is also heavily dependent upon both vehicle emissions and weather. However, no exceedances of either the 9 ppm 8-hour ambient standard or the 20 ppm 1-hour standard have been recorded recently in Lodi. Both oxidant and CO have been reduced significantly by improved emission controls on new automobiles in the past decade.

Table 7

Ambient Air Quality
San Joaquin County

Pollutant	1980	1981	1982	Standard	Measured Units
Ozone (1)					
Maximum	14	13	13	10	pphm, 1-hr ave
Exceedances	78	26	28	1	days per year
Carbon Monoxide (1)					
Maximum hour	10	9	12	20	ppm, 1-hr ave
Maximum 8-hour	5	4	7	9	ppm, 8-hr ave
Exceedances 8-hour	0	0	0	1	days per year above 9 ppm
Nitrogen Dioxide (2)					
Maximum	13	14	19	25	pphm, 1-hr ave
Exceedances	0	0	0	1	days per year
Sulfur Dioxide (2)					
Maximum	4	3	3	5	pphm, 24-hr ave
Exceedances	0	0	0	2	% of days per year
Total Suspended Particulates (2)					
Annual Geom. Mean	85	79	66	60	ug/m^3 ave
Daily Exceedances	34	22	20	2	% of days above 100 ug/m^3

Source: California Air Resources Board monitoring data for:
(1) Ham lane station in Lodi
(2) Hazelton Street station in Stockton

Total suspended particulates are produced by vehicles, heavy industry and soil-moving activities such as construction and farming. In Stockton, ten miles south of the project area, the annual average (annual geometric mean) TSP concentration has been consistently above the 60 ug/m^3 ambient standard. The daily average standard of 100 ug/m^3 was also exceeded on over 34% of the days tested din 1980 and over 20% of the days in both 1981 and 1982.

Sulfur dioxide is primarily associated with chemical and refining industries and is not a problem in San Joaquin County. The superior controls required on chemical process plants are largely responsible for this achievement. Nitrogen oxides are heavily produced by vehicles and high-temperature industrial operations, but as yet have not produced serious concentrations in the region (Shelley, 1984).

IMPACTS AND MITIGATIONS

Impact: Incremental decrease in local emission concentrations as a result of project implementation.

Because the intent of the project is to improve the flow of traffic on Ham Lane by providing more lane capacity, air quality emissions and impacts would be lower on Ham Lane and on neighboring streets as higher average speeds are achieved through less congested traffic flow. However, lower emissions per vehicle would be offset somewhat by anticipated increases in vehicle volumes in future years. The project will not generate additional new trips system-wide, but only will accommodate future projected traffic volumes.

Vehicles are responsible for the emission of a number of pollutants--hydrocarbons, particulates, NO_x and others. The most widely-used indication of vehicular emissions impact is to model concentrations of carbon monoxide (CO) at nearby sensitive receptor locations. Roadside CO concentrations are directly related to the number of vehicle trips on nearby streets and to the average vehicle emission rate. However, average emissions decrease as average speed increases. The actual concentrations at the receptors are determined by the speed and direction of the wind and the temperature layers in the lower atmosphere. Atmospheric conditions control the mixing, diffusion and transport of the pollutants after they are emitted.

Roadside CO concentrations were modeled for two no project and two project case studies, based upon different lane configurations and traffic volumes. (See Appendix D for model details.) Table 8 presents the various traffic volumes and resulting changes in roadside CO concentrations. Average Ham Lane speeds are estimated to be 30 mph during peak hour and 35 mph at other time for the various project years. The "no project" option would be seriously congested and speeds are estimated to be 20 mph at peak hour and 25 mph at other times.

The concentrations listed in Table 8 are based only upon vehicles on Ham Lane. The total CO concentration would include a variable background concentration of from 1 to 5 ppm from other vehicular emissions and sources in the area.

The modeled concentrations show the effects of the gradual increase of traffic volumes assuming no project (1985), and the proposed project (1995, 2005). No project (2005) concentrations are caused by congestion and low speeds with only two traffic lanes. Neither the state 20 ppm peak-hour standard nor the 9 ppm 8-hour standard are threatened by the Ham Lane traffic in any case. The project would be expected to reduce slightly local CO concentrations relative to a two-lane road.

Another way to evaluate the potential impact of the proposed project is to estimate the overall change in vehicular emissions produced by the project. The total emissions produced by a group of vehicles depends upon the number of trips, the trip length and the average speed. Since the total number of trips and trip length are not changed by the Ham Len project, the average speed is

Table 8
Ham Lane Project
CO Concentrations

Case	Year	Traffic Volumes	Peak Hour CO	High 8-Hour CO
1. No Project Two Lanes	1985	12,500 ADT	1.1	0.3
2. Project Four Lanes	1995	20,300 ADT	1.3	0.4
3. Project Four Lanes	2005	25,300 ADT*	1.6	0.5
4. No Project Two Lanes	2005	25,300 ADT*	2.0	1.0

Source: Stan Shelley, 1984

the only variable which affects total emissions. Based upon an estimated higher average speed (35 mph vs. 25 mph) with project implementation, total estimated emissions on Ham Lane would change as follows:

CO	28%
NMHC	19%
NO_x	+7%
Part	No Change

Particulate emissions are not related to speed and that as speed increases, oxides of nitrogen are slightly increased, which is opposite to CO and non-methane hydrocarbons. The CO pollutant is the most sensitive to speed and therefore would benefit the most from the reduced congestion offered by the four lanes.

Mitigation

18. None required as the project appears to have a net benefit to local air quality. Increasing average vehicle speed by increasing the number of traffic lanes on congested routes is itself an air quality mitigation measure recommended on some types of projects to offset increasing trip volumes.

* These figures were calculated from a preliminary "worst case" analysis which was later modified downwards to 23,100.

<u>Impact</u>: Temporary decrease in local air quality due to generation of dust during project construction.

During the grading and construction phase, dust may be produced, particularly during the dry months of the year. However, this impact is temporary and will be limited to the time of construction.

Mitigation

19. Minimize generation of dust and particulates through standard sprinkling/watering applications on dusty working areas at least once a day.

EXISTING CONDITIONS

Land uses within the project area consist of a mix of predominantly residential and some commercial. Forty-eight single family homes, a 26-unit apartment building and two duplexes front Ham Lane between Lodi Avenue and Elm Street. A church, nursery and veterinary hospital are the only non-residential uses abutting the street within this area. The applicable zoning establishes a 20-foot setback for all uses in the project area. The project area is characterized by older, well maintained homes and landscaping. The larger, older trees provide shade and create a pleasant visual quality associated with tree-lined streets.

Land uses along Ham Lane north and south of the project area are also a combination of residential and commercial uses. The area along Ham Lane north of Elm Street is primarily low density residential, except for a commercial section at Ham Lane and Lockeford Street, where stores, restaurants and gas stations are located. South of Lodi Avenue there is a mix of residential and office uses. A medical complex is currently under construction on the southwest corner of Ham Lane and Lodi Avenue. Lodi Avenue High School is located west of Ham Lane between Lodi Avenue and Elm Street.

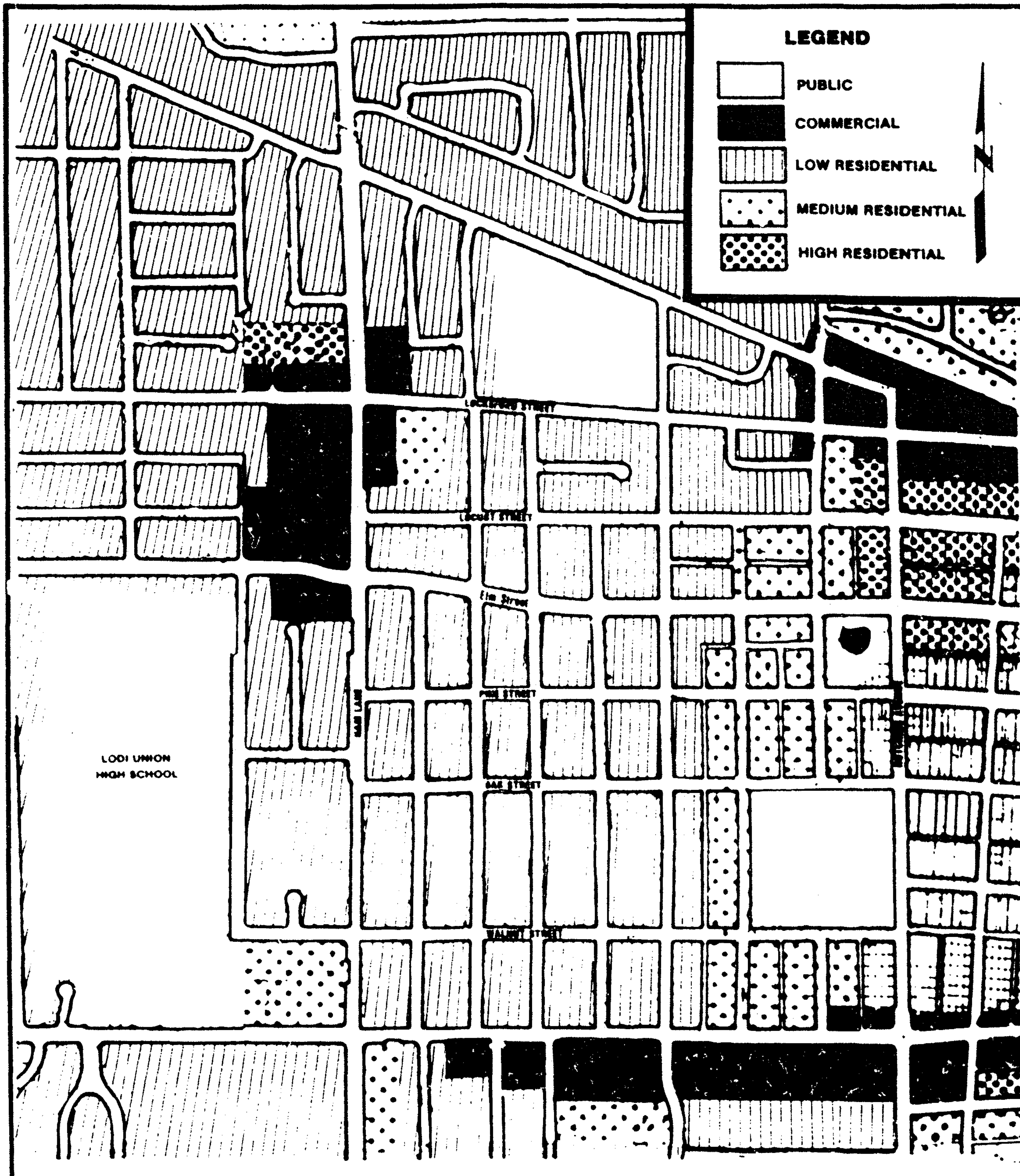
The City's General Plan guides future land uses in the project area and vicinity. The area basically has developed according to the General Plan designations for the area which are shown on Figure 8. The surrounding area is predominantly developed and the last major vacant parcel is currently being developed along Ham Lane south of Lodi Avenue (Morimoto, Personal Communication, 1984). There is also room for Lakewood Shopping Center to expand westward on Elm Street. The proposed Ham Lane Improvement Project is consistent with the City's General Plan.

IMPACTS AND MITIGATIONS

Impact: Change in the perceived neighborhood character.

Because the proposed project is consistent with the City's General Plan, and the project area and immediate vicinity are basically developed, no new development or population shifts will be generated as a result of this project. Development patterns to the north and south of the project area are well established, also in accordance with City plans. Therefore, the issue of concern is how the 4-block neighborhood character will be changed as a result of the project.

Street widening will result in the loss of trees and lanscaping which would serve to reduce shade and alter the visual character of the project neighborhood. Front yards would be reduced to an average depth of about 14 feet (CH2M Hill, 1978). The average distance from homes to the parking lane would be reduced by one to ten feet. As a result, project area residents probably would be more aware of street traffic and feel a loss of privacy, as their



Ham Lane Land Use

Figure 8

homes would be closer to the street. In addition, there may be future difficulties with resident access to their homes as traffic increases, and other potential traffic hazard concerns.

Mitigation

20. Replant street trees and shrubs compatible and/or identical with those removed, as outlined in Mitigation Measures #1 through #3.

21. Provide crosswalks and traffic signals or stop signs to minimize potential traffic safety hazards.

22. Insure that proper visibility from resident driveways is maintained when street trees are replanted.

23. Consider installation of automatic garage door openers where necessary to provide safe access.

24. The reduction of speeds along Ham Lane, coupled with the installation of double pane nonopening windows and other structural modifications as outlined in Mitigations #10 through #14, will serve to partially reduce noise impacts to residents.

25. Consider provision of four-feet high fence or lattice to provide a sense of resident privacy. This could require variances for both height and setback depending on the location.

Construction Related Impacts

EXISTING CONDITIONS

The proposed road construction will occur in two phases. First, the existing curbs, gutters and sidewalks will be removed from each side of the street and the new facilities will be installed. It is estimated that it will take two to four weeks per block for this removal and replacement, during which time the street will remain open. The second phase consists of repaving and restriping the entire four-block section of Ham Lane. This will take approximately three to four weeks to complete, during which time the street will be closed to through traffic, but homeowners will be granted access. Typical equipment to be used include backhoes, scrapers, graders, compacters, pavers, miscellaneous trucks (gravel, concrete, asphalt), and jackhammers. Water trucks will water unpaved sections as the work progresses. Hours of construction will be scheduled generally between 7:00 A.M. and 4 P.M. weekdays.

Construction-related impacts resulting from the proposed project will be of five general categories: traffic disruption and congestion and parking loss, noise generation, degradation of local air quality, disruption of area businesses, and potential disruption of subsurface utilities. The Traffic, Noise and Air Quality sections of this report describe existing conditions related to these concerns. There are three non-residential uses in the project subject to potential business disruption: a nursery, a veterinary hospital, and a church. Subsurface utilities include water and sewer lines and are located within the street.

IMPACTS AND MITIGATIONS

Impact: Local traffic disruption and loss of parking.

Although the project section of Ham Lane will be closed for 3 to 4 weeks during construction, detouring can alleviate traffic congestion along Ham Lare. However, minor inconveniences will be be experienced by local residents during this period. The street will be open to residents, even when closed to through traffic. However, there will be a temporary loss of driveway access for 1 to 3 days during reconstruction of sidewalks, curbs and gutters. During construction, a temporary loss of street parking will also result.

Detouring local traffic during construction will create minor inconveniences for neighboring streets, which will experience a temporary increase in traffic. Emergency access for fire, police and ambulance services also will be disrupted during the construction period.

Mitigation

26. Plan detour routes for minimal disruption surrounding neighborhoods.

27. Notify emergency services (fire, police, ambulance) of street closure and detour routes in advance of construction.

28. Plan construction around peak traffic times if possible, and complete construction in as timely a manner as possible.

Impact: Temporary increase in vicinity noise levels due to construction.

See discussion in Noise section of this report.

Mitigation

29. Follow Mitigation Measures #15 through #17.

Impact: Temporary localized degradation of air quality due to increased generation of dust.

See discussion in Air Quality section of this report.

30. Follow Mitigation Measure #19.

Impact: Temporary disruption of area businesses..

There are three non-residential uses in the project area: a nursery, a veterinary hospital, and a church. The church shouldn't be impacted as much as the other two uses because construction activities will not be occurring during times of typical church activities. However, temporary disruption to the other two businesses will occur as a result of loss of parking and restricted access. The approximate length of time during which the businesses may be affected will be 1 to 3 days during sidewalk reconstruction and 3 to 4 weeks during street reconstruction.

Mitigation

31. Schedule construction to be completed as soon as possible in front of area businesses.

Impact: Potential disruption of subsurface utilities.

Mitigation

32. Contact appropriate utilities to determine location and depth of underground lines, and plan construction so as to avoid these utilities.

Environmental Evaluations

Unavoidable Adverse Impacts

For the purposes of this section, unavoidable adverse impacts are those effects of the project which would affect either natural systems or other community resources. The degree of significance was determined by this consultant following completion of project evaluation. The following list includes only the identified significant, adverse impacts of the project.

Significant impacts that cannot be reduced to a level of insignificance include:

-- Increase in vehicular noise.

Significant impacts of the project which cannot be alleviated or reduced in significance without a substantial change in project design include:

-- Increase in vehicular noise.

Potentially significant impacts which can be minimized or eliminated if mitigations outlined in this report are followed include:

-- Loss of street trees and landscaping.
-- Change in neighborhood character.
-- Temporary increase in construction-related noise.

It shculd be noted that the loss of street trees and change in neighborhood character will be an unavoidable aspect of the project. The implementation of recommended revegetation plans will result in a long-term mitigation (10 to 30 years) but will not provide any short-term mitigation.

Growth Inducement

EXISTING CONDITIONS

CEQA requires that any growth-inducing aspect of a project be discussed in an EIR. This discussion should include consideration of ways in which the project couuld direcly or indirectly foster economic or population growth in a surrounding area. Projects which could remove obstacles to population growth (such as a major public service expansion) must also be considered in this discussion. According to CEQA, it must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment.

Because the project does not provide any new access routes or opportunities it is not directly growth inducing. No new areas will be served by the improved section and no areas would be allowed to develop which are not already developed. The project is consistent with area plans and policies and will serve to enhance access patterns rather than create new ones. Although trips may be attracted to this route which do not currently occur, this is not growth inducing for a larger area.

Project Alternatives

This section evaluates alternatives to the proposed Ham Lane Improvement Project as required by CEQA. The discussion describes a number of alternatives (including the required "no project" alternative) which could feasibly attain the basic objectives of the project, as well as eliminate or reduce in significance those impacts identified in this report. Any additional impacts arising from the alternatives themselves are generally outlined and discussed.

The City of Lodi has identified several alternatives to the proposed project. These alternatives, identified below, represent the primary design options open to the City for alleviating congestion on Ham Lane. The consultant has not identified any options beyond those presented by the City, as our evaluation indicated that these options did, in fact, constitute the most feasible and realistic alternatives to the proposed project. Figures 9-1 and 9-2 show traffic projections and Figgures 10-12 illustrate alternative configurations. All figures are at the end of this section.

<u>Alternative A</u>: 72′ right-of-way (R/W) with 56′ developed width (primary construction and R/W acquisition on east side).

This alternative would result in the construction of a 56′ street within a 70′ R/W. The street would begin from the existing sidewalk on the west side of the street and extend ±56′ toward the east. Thus, the bulk of R/W acquisition and construction would occur on the east side of Ham Lane. This option also has two possible stripings or lane configurations: 1) four travel lanes with no on-street parking, or 2) two travel lanes, center turn lane and on-street parking.

<u>Alternative B</u>: 72′ right-of-way (R/W) with 56′ developed width (primary construction and R/W acquisition on west side).

This alternative and its lane options are exactly as those discussed above, except that the developed width would be measured from the existing sidewalk on the east side of the street and extend ±56′ toward the west. Except in the two blocks south of Oak on the east side where approximately seven feet of widening would be required. Thus the bulk of R/W acquisition and construction would occur on the west side of the street.

<u>Alternative C</u>: Improve roadway within existing curb and R/W (except between Lodi and Walnut).

This is essentially a "No Project" alternative. This alternative would result in widening of the west side between Lodi and Walnut only with reconstruction of the rest of the street within the existing curbs.

DISCUSSION

Table 9 presents the various LOS for the three traffic ranges for the year 2005.

Table 9
Projected Year 2005 Roadway Levels of Service

Roadway Cross-Section Alternative	Year 2005 Traffic Projections: Minimum Range Roadway LOS	Maximum Range Roadway LOS
LODI TO PINE		
Alternative A & B 56′ 3-Lane Section	A	C
Alternative A & B 56′ 4-Lane Section*	A	A
Alternative C Existing Section	A	D
Proposed Project 64′ 4-Lane Section	A	A
PINE TO ELM		
Alternative A & B 56′ 3-Lane Section	A	B
Alternative A & B 56′ 4-Lane Section*	A	A
Alternative C Existing Section	B	C
Proposed Project 64′ 4-Lane Section	A	A

All four cross section/lane configurations options can accommodate the projected traffic volumes at a LOS B through the year 2005. However, if maximum traffic growth occurs the Alternative C and Alternatives A and B (with the two travel lanes, one center lane and parking lane configuration) will experience reduced LOS by the year 2005.

* No parking.

Implementation of Alternative B, with primary R/W acquisition and street development on the west side would result in the retention of a significant number of street trees when compared to the proposed project and Alternative A.

Thus, the following statements can be made about the implementation of the various alternatives:

Implementation of Alternative A would:

-- Primarily impact the residents along the east side of Ham Lane.
-- Result in the loss of ±20 mature street trees.
-- Provide LOS B to the year 2005 if striped for four lanes/no parking and LOS C to B if striped for two travel lanes, one center turn lane and on-street parking.
-- Minimize disruption of the entire 4-block long corridor.

Implementation of Alternative B would:

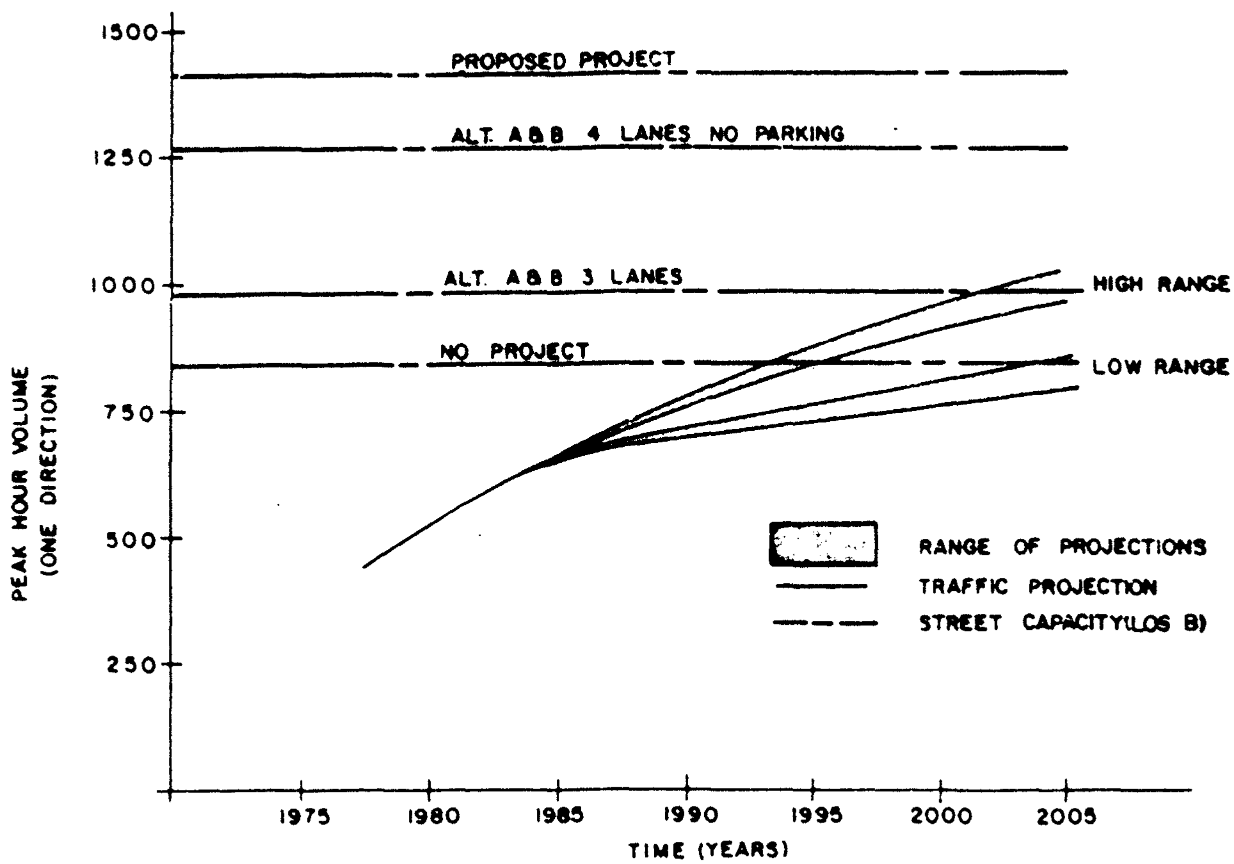
-- Primarily impact the residents along the west side of Ham Lane.
-- Result in the loss of ±8 mature street trees.
-- Provide LOS B to the year 2005 if striped for four lanes/no parking and year 2005 LOS C to B if striped for two travel lanes, one center turn lane and on-street parking.
-- Minimize disruption of the entire 4-block long corridor.

Implementation of Alternative C would:

-- Provide low LOS (D) by the year 2005.
-- Primarily impact the residents between Lodi and Pine.
-- Result in the loss of 6 mature street trees.
-- Result in the improvement of the Lodi/Ham Lane intersection.
-- Minimize disruption of the entire 4-block long corridor.

ENVIRONMENTALLY SUPERIOR PROJECT

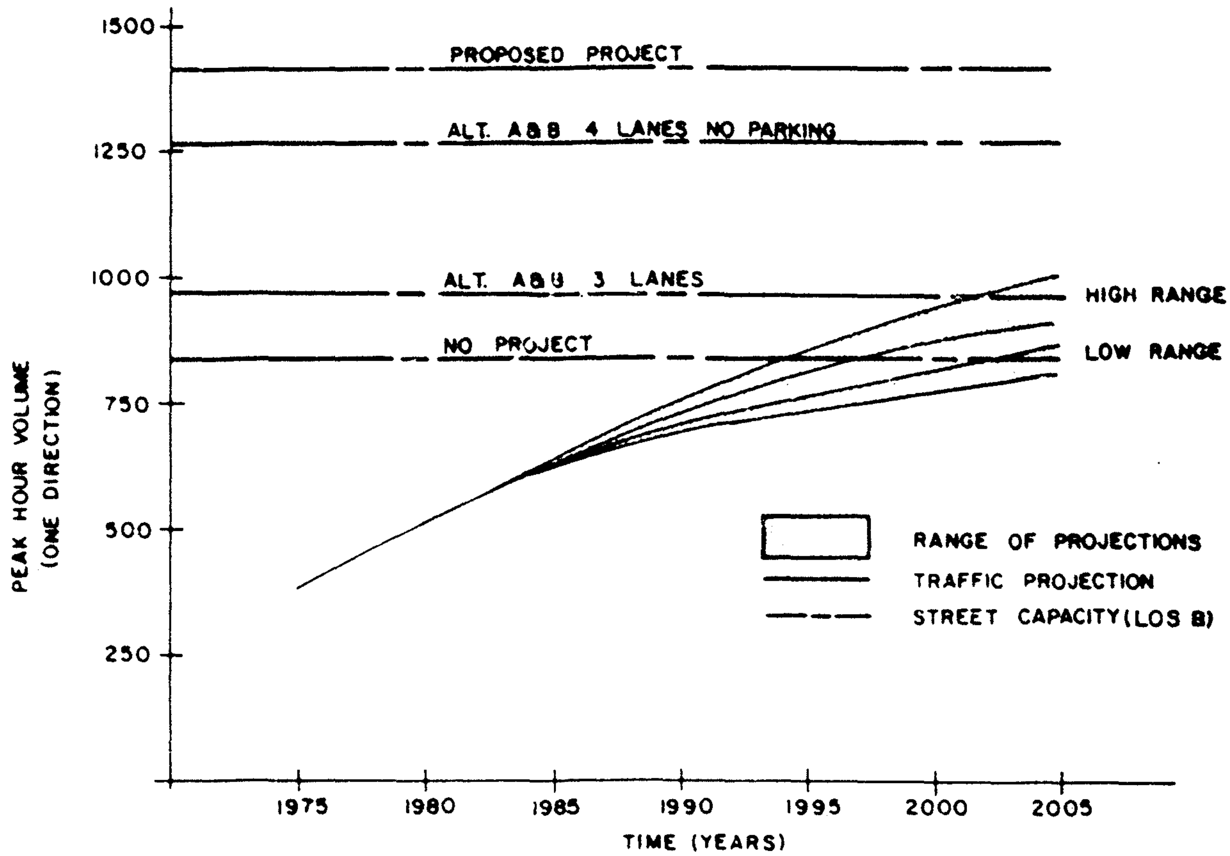
The environmentally superior project for the Ham Lane Improvement Project appears to be Alternative B with the two travel lanes, one center turn lane and on-street parking stiping option. However, this statement is made with the knowledge that selection of this project would result in the potential for the city to have to accept a lower LOS on the street by the year 2005, restripe the street to preclude on-street parking near that year, or rebuild a larger project at that time. So, although Alternative B is clearly environmentally superior in that fewer trees are affected, fewer residents are directly impacted and the character of the street is retained, this option could raise potential conflicts with adopted City policy concerning levels of service and expense of reconstruction again at some future date. Therefore, the environmental facts will need to be weighed against the practical and policy issues.



Traffic Projections and Street Capacities

Lodi to Pine

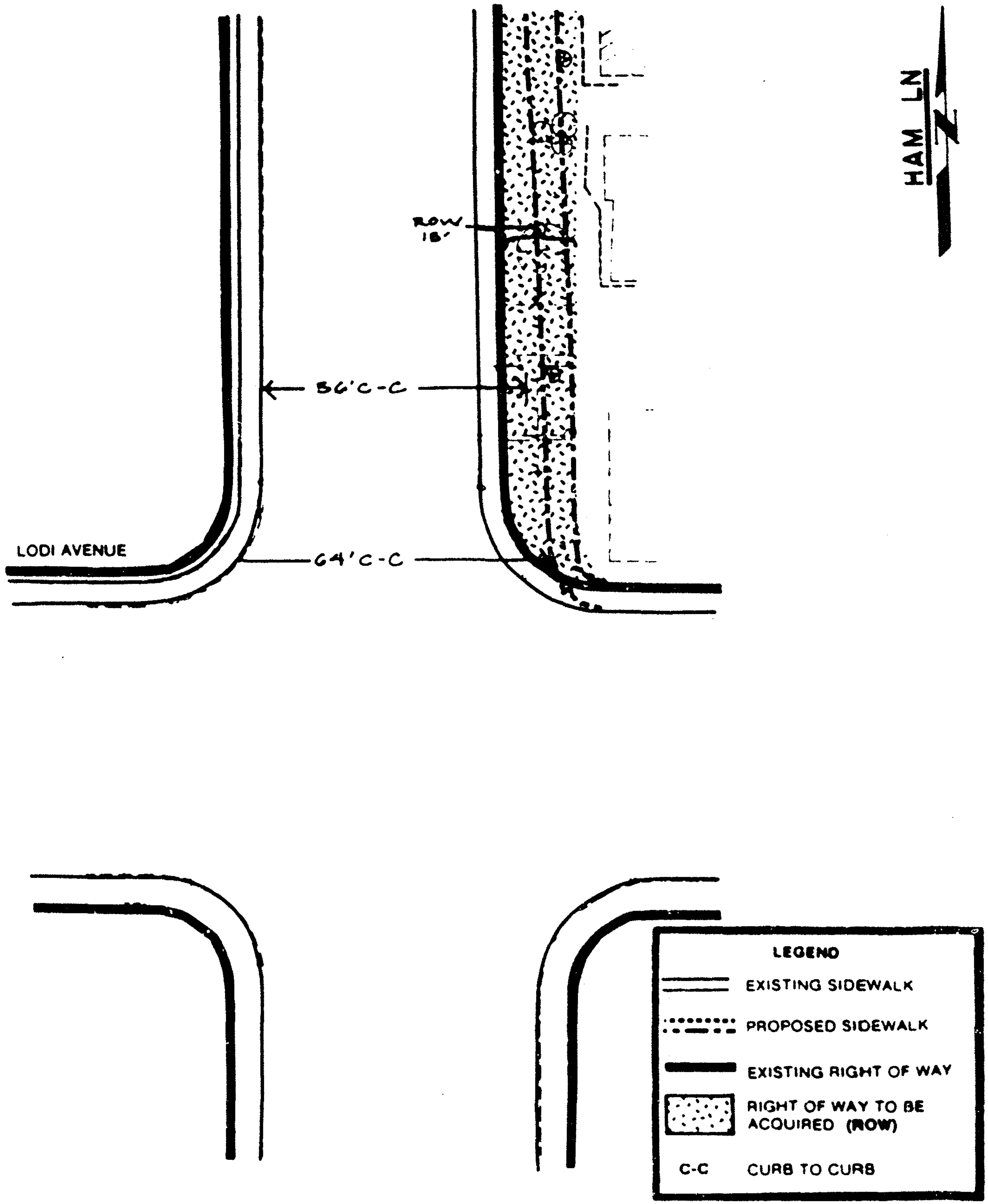
Figure 9-1



Traffic Projects and Street Capacities

Pine to Elm

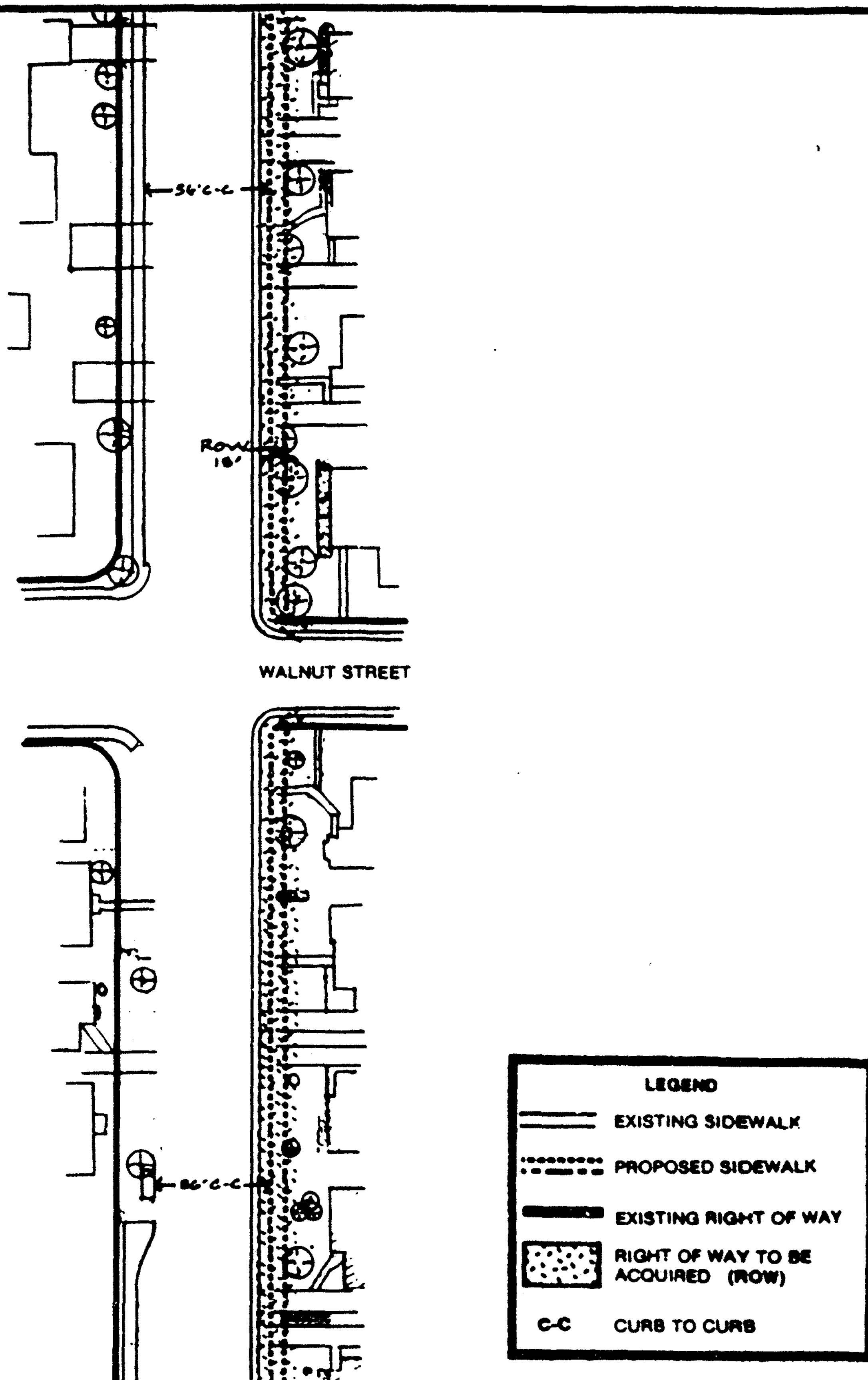
Figure 9-2



Ham Lane Project Alternative A

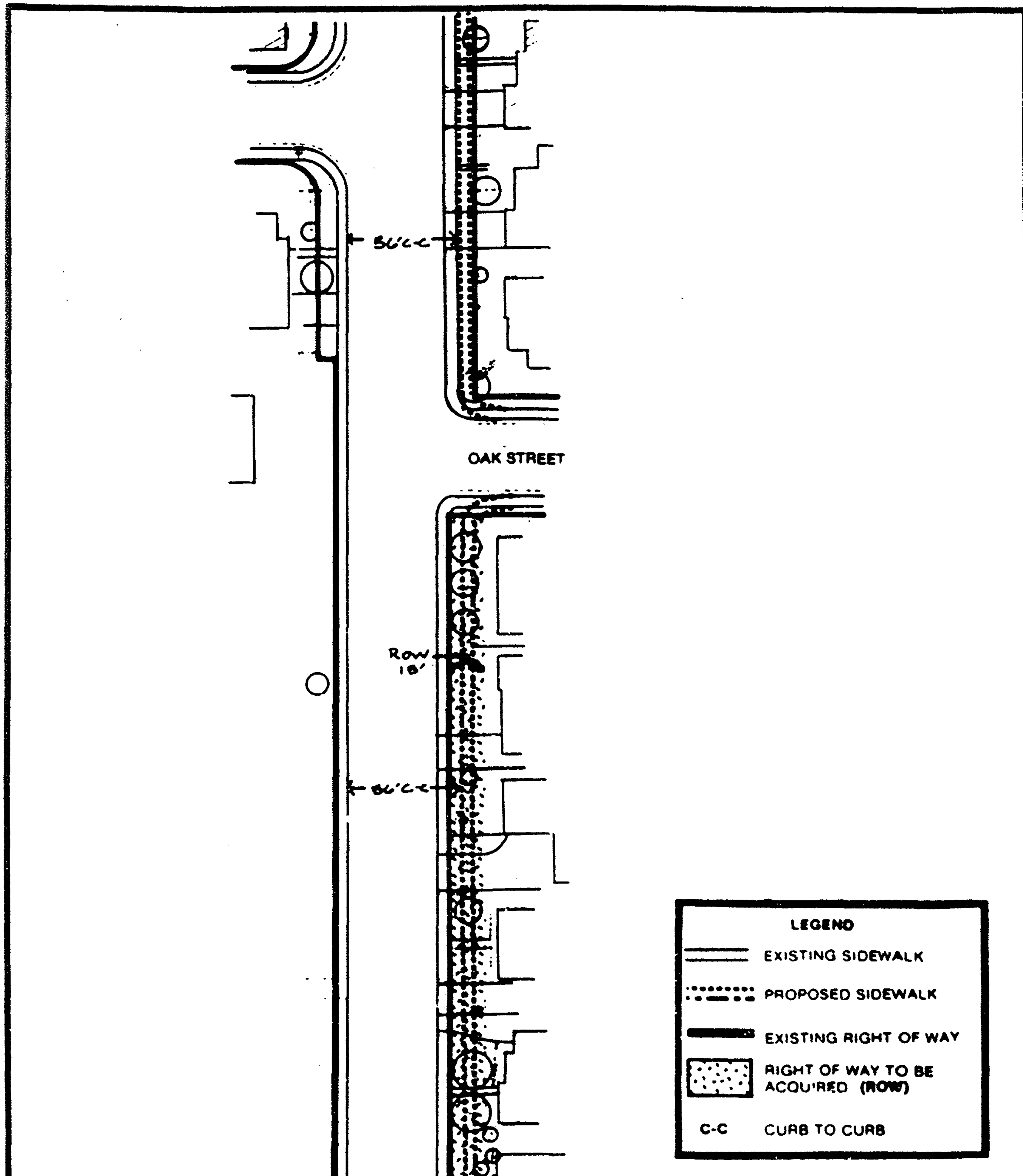
Primary Impact East Side

Figure 10-1



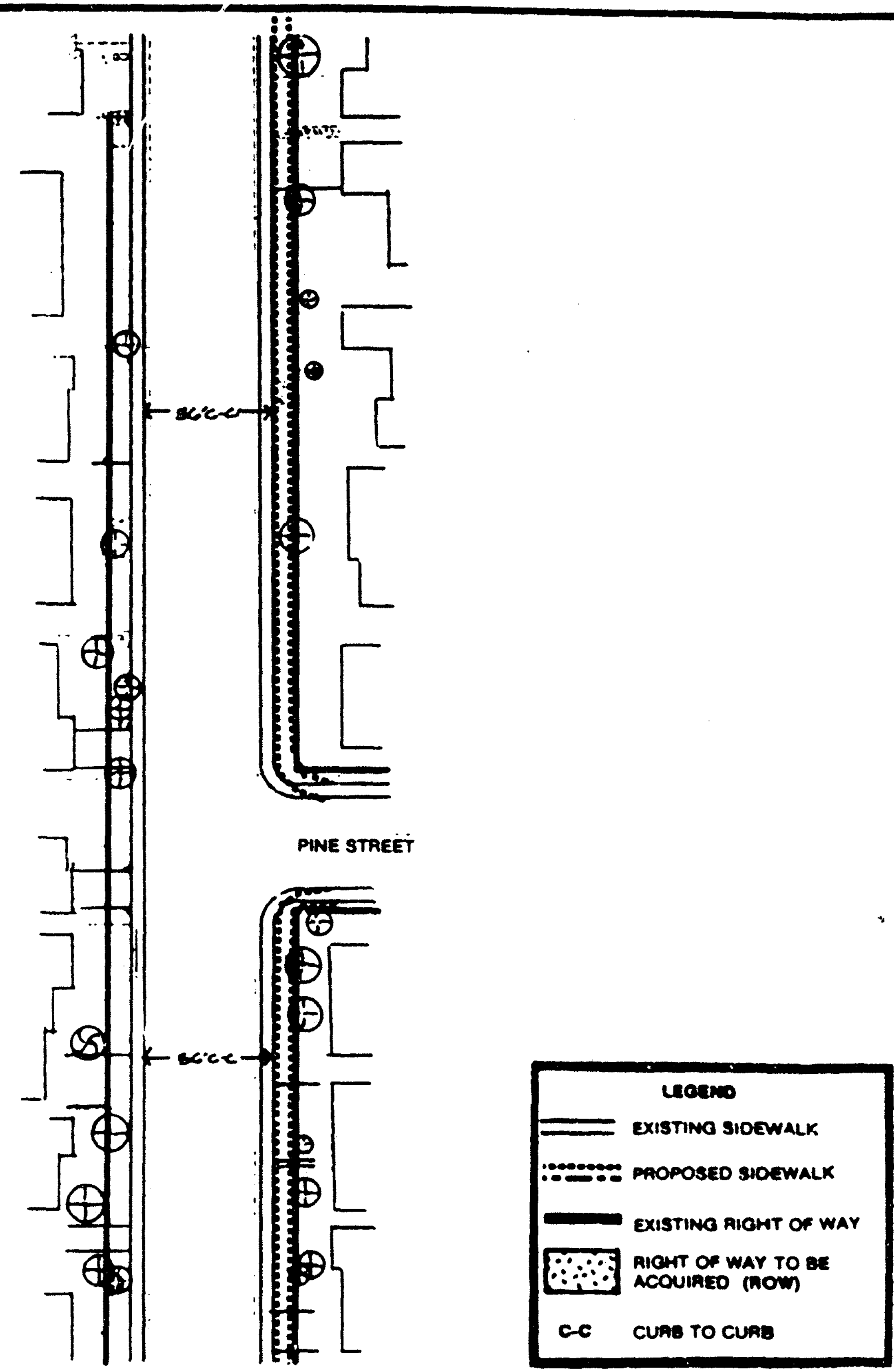
Ham Lane Project Alternative A

Figure 10-2



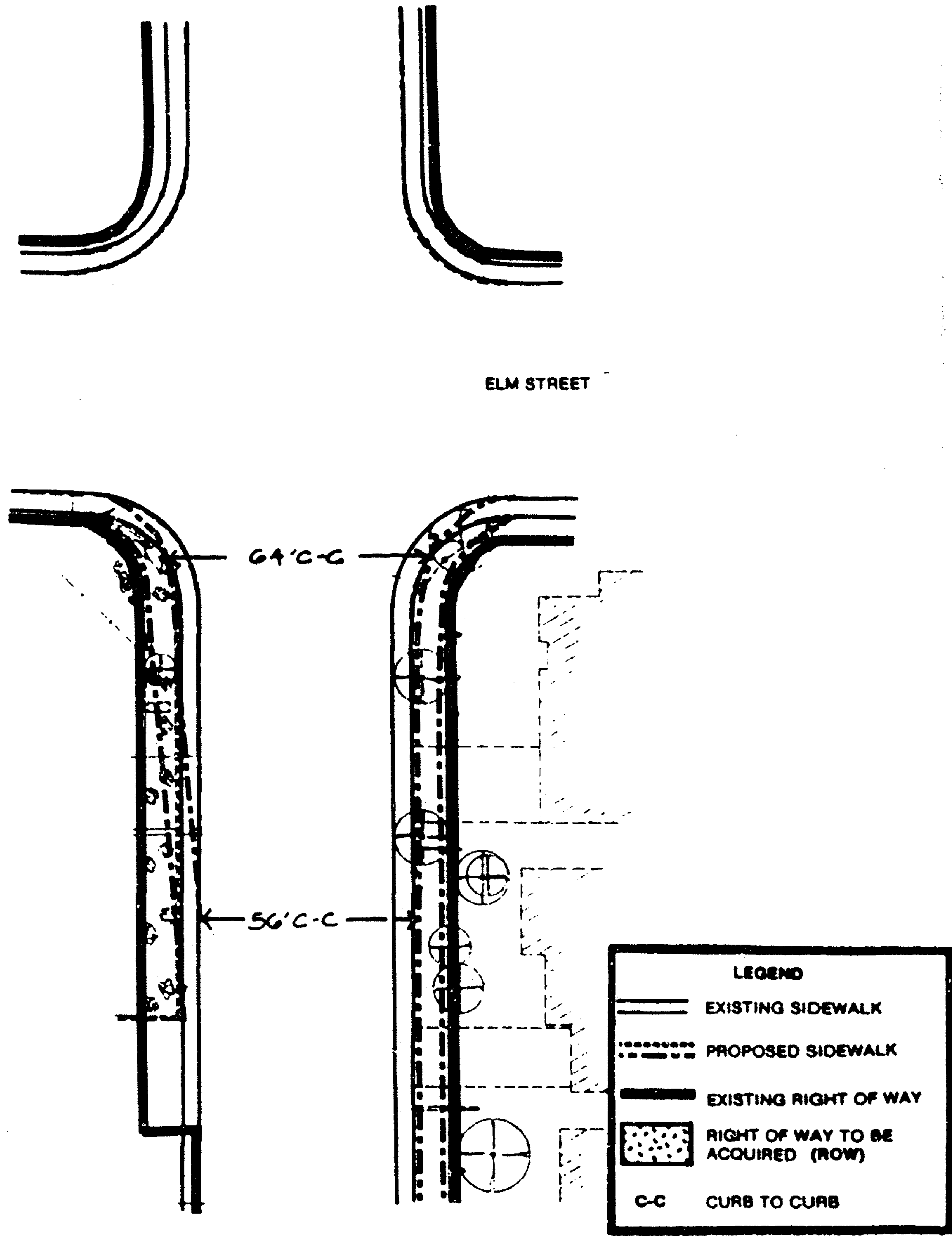
Ham Lane Project Alternative A

Figure 10-3



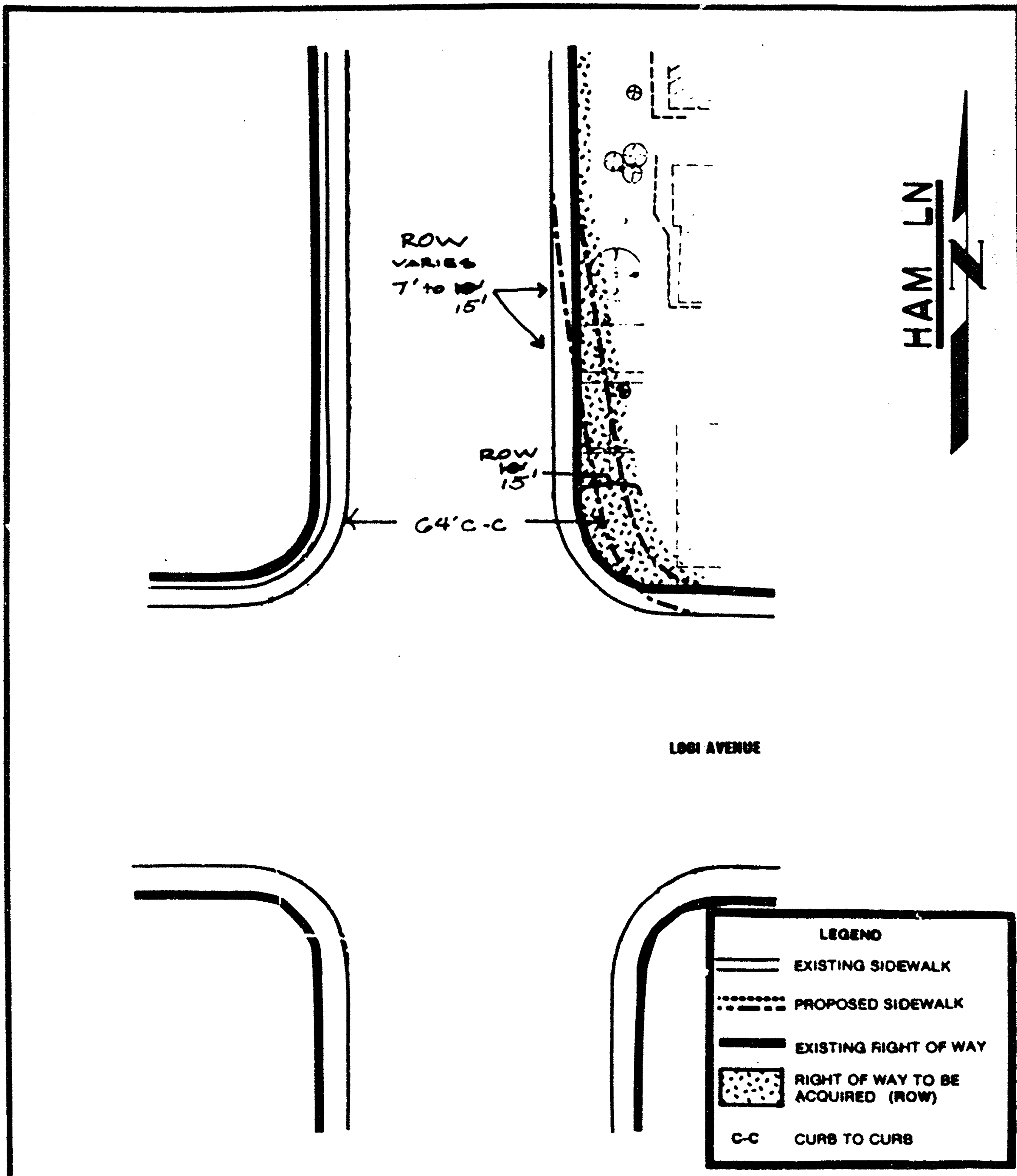
Ham Lane Project Alternative A

Figure 10-4



Ham Lane Project Alternative A

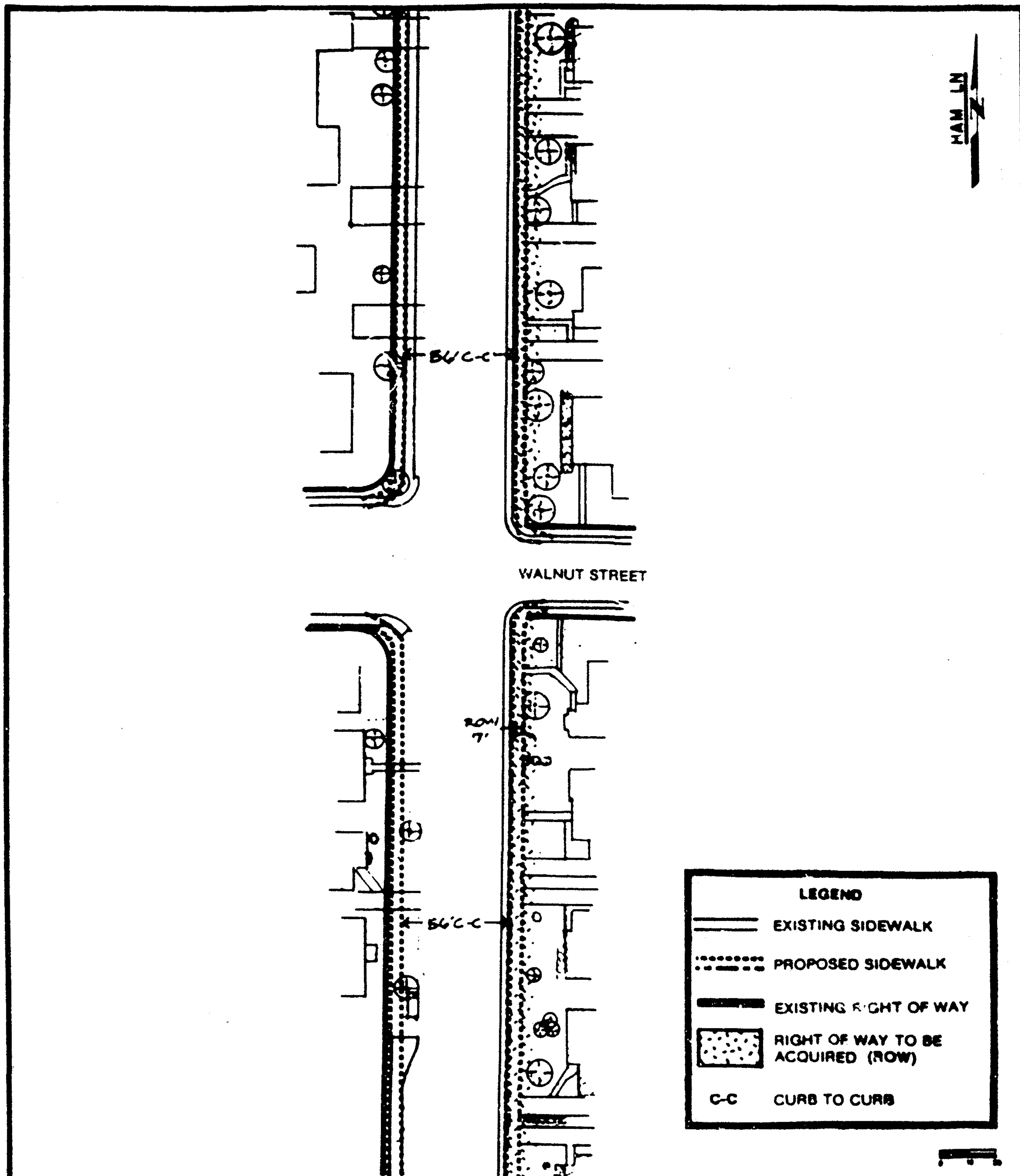
Figure 10-5



Ham Lane Project Alternative B

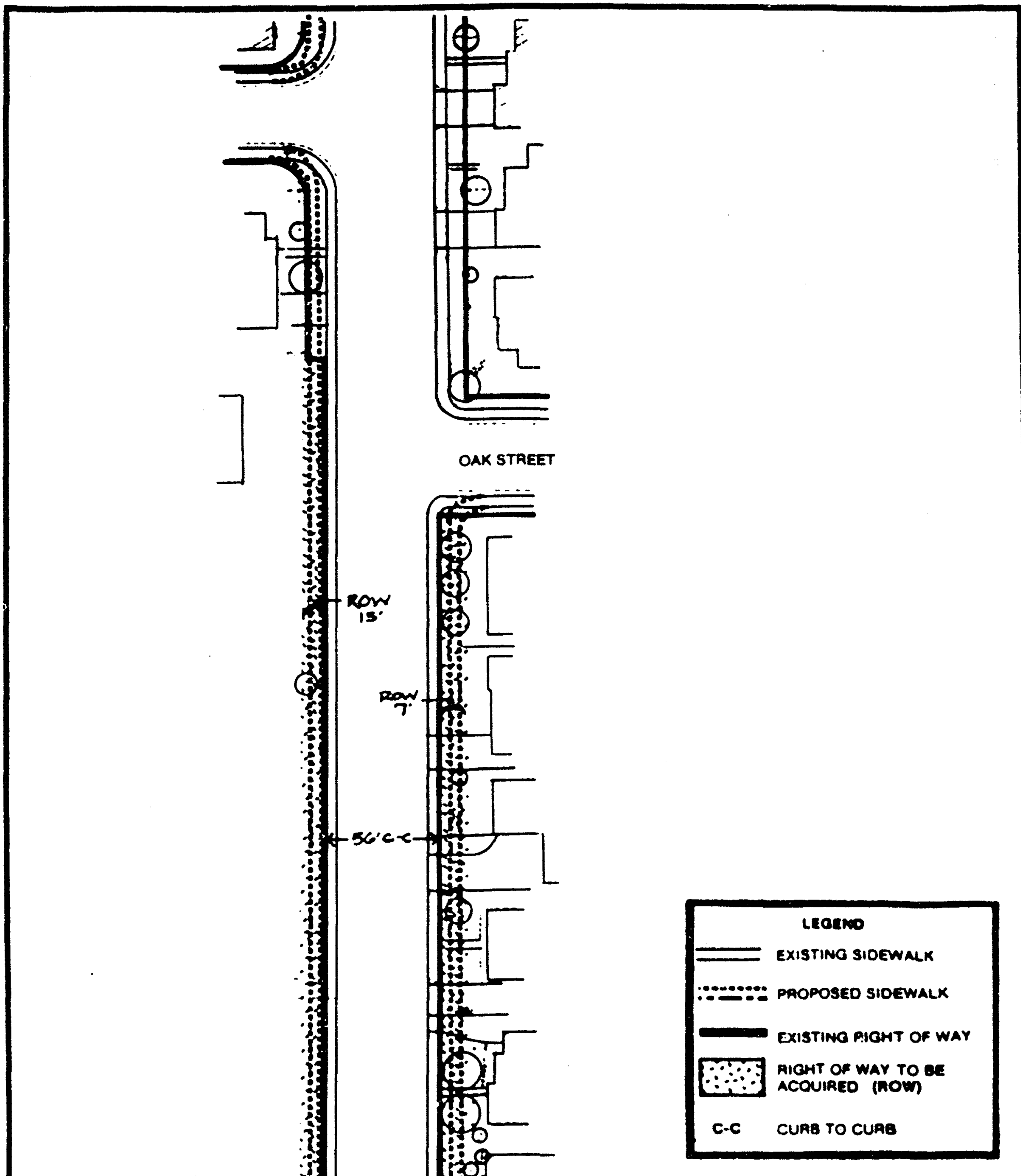
Primary Impact West Side

Figure 11-1



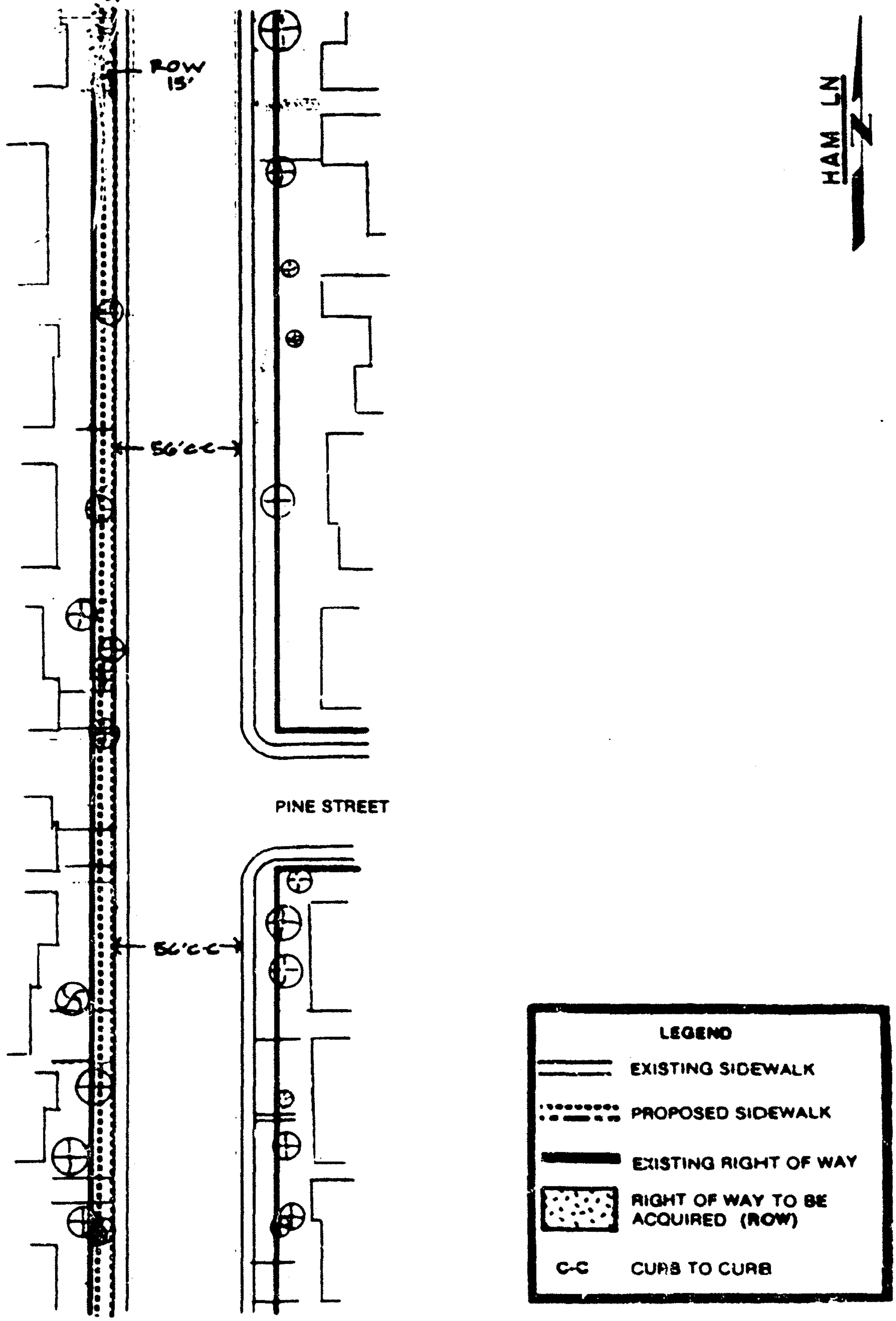
Ham Lane Project Alternative B

Figure 11-2



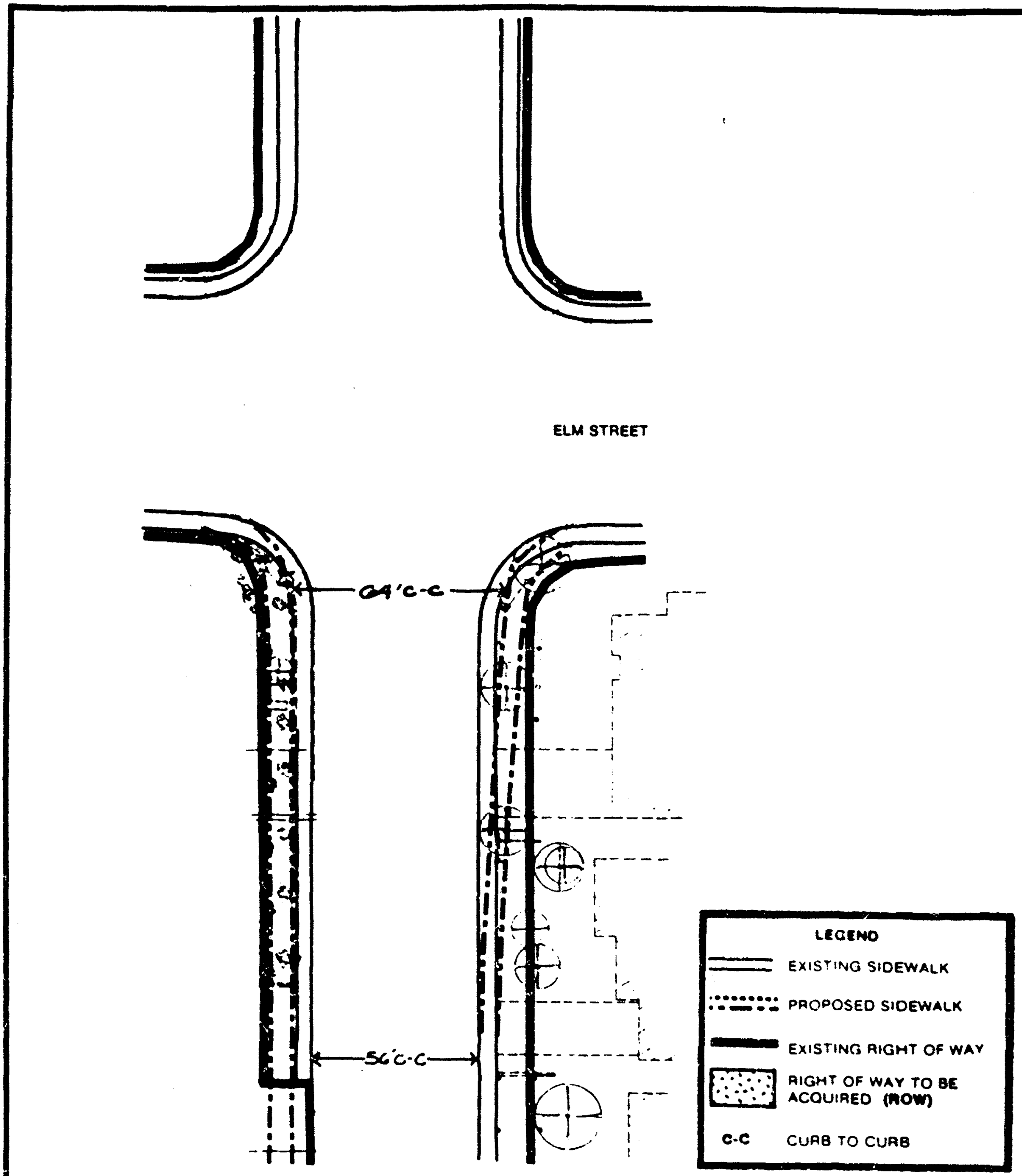
Ham Lane Project Alternative B

Figure 11-3



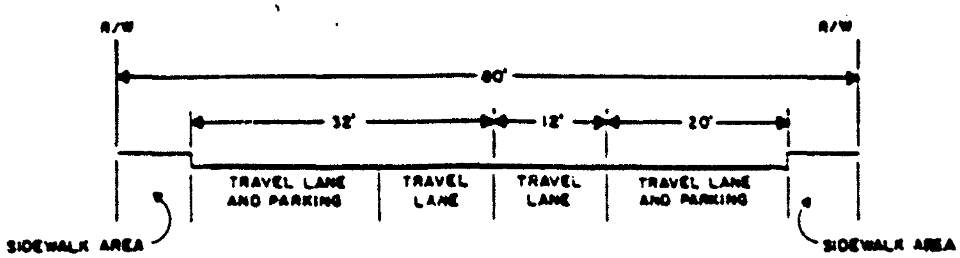
Ham Lane Project Alternative B

Figure 11-4

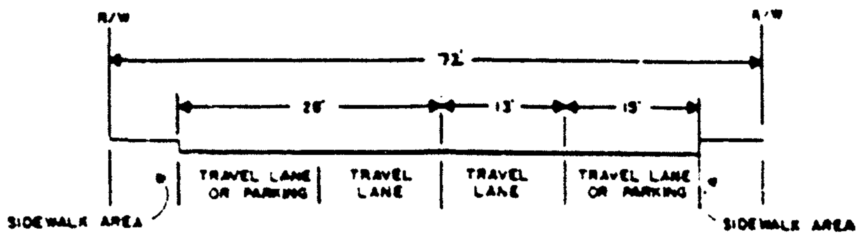


Ham Lane Project Alternative B

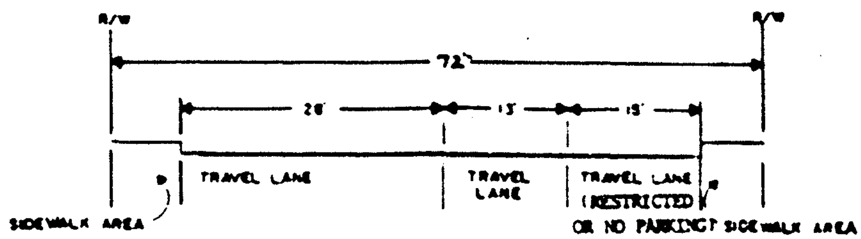
Figure 11-5



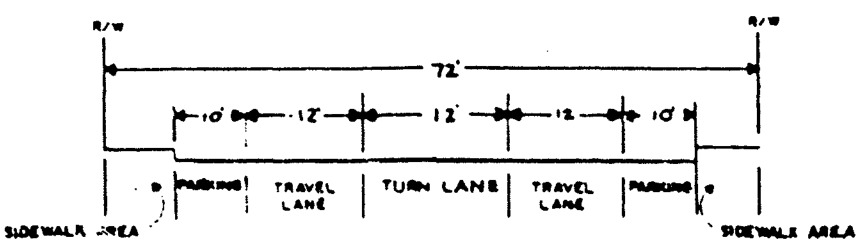
PROPOSED PROJECT — 64' STREET, 80' RIGHT-OF-WAY



ALTERNATIVE A & B - 56' STREET, 70' RIGHT-OF-WAY



ALTERNATIVES A & B - 4 TRAVEL LANES, NO PARKING



ALTERNATIVES A & B — 2 TRAVEL LANES, CENTER TURN LANE, PARKING OPTION

ALTERNATIVE STRIPING OPTIONS

Alternative Street Cross Sections

Figure 12

Elsie Sokol
Twai Sokol
T. Sweat
Marvis Sweat

REFERENCES

California Resources Agency. State CEQA Guidelines.

CH2M Hill, Ham Lane Improvement Project, Lodi Avenue to Elm Street: Final Environmental Impact Report, City of Lodi, May 1978.

CH2M Hill, Hutchins Street Improvement Project, Draft Environmental Impact Report, City of Lodi, October 1981.

CH2M Hill, Hutchins Street Improvement Project, Environmental Impact Report, City of Lodi, February 1982.

Shelley, H. Stanton, "Air Quality Impact and Mitigation Study, Ham Lane Improvement Project." Environmental Consulting Services. August 1984.

Shelley, H. Stanton, "Noise Ipmact and Mitigation Study, Ham Lane Improvement Project." Environmental Consulting Services. Auguust 1984.

Appendices

Appendix A

Plants Inventory

by

Suzanne Olive

LIST 1:

The following plant species will be removed should Ham Lane be widened to utilize the eighty foot right-of-way:

On the east side between Elm Street and Pine Street:
- 3 mature Fraxinus velutina 'Modesto', Modesto Ash
- a few Rosa sp., Roses

between Pine Street and Oak Street:
- 1 mature Acer saccharinum, Silver Maple
- 1 Citrus sp.

between Oak Street and Walnut Street:
- 3 mature Silver Maples
- 1 immature Liquidambar styraciflua, American Sweet Gum
- 4 immature Betula verrucosa, White Birch
- 1 mature Cedrus deodara, Deodar Cedar
- 2 mature Calocedrus decurrens, Incense Cedar
- shrub Juniperus sp., Juniper
- 2 mature Picea pungens, Colorado Blue Spruce
- 1 mature Picea sp., Spruce
- 1 Fruit Tree
- 3 Modesto Ash - mature

between Walnut Street and Lodi Avenue:
- 1 immature Morus alba, Fruitless Mulberry
- 1 immature Colorado Blue Spruce
- 1 mature Colorado Blue Spruce
- 1 Lagerstroemia indica, Crape Myrtle
- a few shrubs, including Roses, Junipers, and Euonymus
- 1 mature Acer negundo, Box Elder
- 4 mature Modesto Ash
- 2 immature White Birch
- 2 Fruit Trees

On the west side between Elm Street and Oak Street:
- numerous shrubs: Junipers; Ilex sp., Holly; Crape Myrtles; and Grevillea sp. (landscaping bordering nursery) also Junipers, Cotoneaster sp., Cercis sp.
- 1 mature Pinus sp., Pine
- 1 immature Pine
- 2 mature Modesto Ash
- 2 Cupressus sempervirens, Italian Cypress
- 1 mature Colorado Blue Spruce

between Oak Street and Walnut Street:
- 2 Euonymus sp.
- 1 mature Colorado Blue Spruce
- 1 mature Modesto Ash

between Walnut Street and Lodi Avenue:
- 2 mature Modesto Ash
- a few shrubs

August 30, 1984

Kate Burdick
Planning and Land-use Consultant
1545 Shirland Tract
Auburn, California 95603

Dear Ms. Burdick:

Presented below are the probable impacts on the vegetation should Ham Lane be widened to utilize the eighty foot right-of-way.

Approximately twenty-two mature trees will be removed on the east side of Ham Lane. On the west side approximately ten mature trees will be removed. (See attached List 1.) Removal of said trees will result in a loss of shade and an increase in temperature. Further, the locale will be more exposed and drier.

Approximately twenty immature trees and various shrubs will be removed on the east side of Ham Lane. On the west side approximately thirty-two immature trees and shrubs will be removed. The majority of these comprise the landscaping adjacent to the nursery. Removal of these young trees and shrubs will have a visual impact, especially where Ham Lane borders the nursery.

In addition, the widening of Ham Lane will claim approximately ten feet of lawn and landscaping from the dwellings along the roadway. Besides obvious visual impacts, lost lawn area will result in less privacy and increased traffic noise and dust.

Possible mitigation of the impacts discussed above would require replanting Ham Lane with boxed trees of the same or similar species. The Raywood Ash or the Moraine Ash should be substituted for the Modesto Ash. These species are more disease resistant. (See attached List 2.) However, only partial mitigation could be expected because the space available for root growth is suitable in most areas for only small trees. Large trees should be planted a minimum of fifteen to twenty feet away from a dwelling. Medium trees should be planted a minimum of ten to fifteen feet away from a dwelling. Where mature trees stand on or just within the limit of the right-of-way, the width of the sidewalk should be adjusted to accommodate the base of the tree. Approximately fifteen trees would be saved. Trees should be trimmed to allow for a vertical height clearance of ten feet over the sidewalk and curb.

Immature trees and shrubs within the right-of-way could be dug out and replanted on the impacted site if space allows. Additional shrubs could be planted as a hedge or screen to mitigate impacts on appearance, privacy, and noise. (See attached List 3.) Privacy could be further enhanced through the use of four foot fencing or lattice.

Given the age and canopy of the trees to be removed and considering the size of the remaining lawn areas, the full impacts of widening Ham Lane to utilize the eighty foot right-of-way can not be mitigated.

Sincerely,
Suzanne P. Olive
Suzanne P. Olive
Botanist

LIST 2 (cont.)

Scientific name / Common name	Evergreen/ Deciduous	Height to: / Width to:	Comments
MEDIUM TREES (cont.)			
Celtis sinensis Chinese Hackberry	D	40 feet	Bark often covered with projecting growth, deep rooted, won't heave sidewalk, good in windy places, plant from containers
Ceratonia siliqua Carob Tree	E	30-40 feet 30-40 feet	Large shrub or tree, moderate growth rate, needs more than normal space, roots will break sidewalk, give infrequent, deep watering
Fraxinus holotricha 'Moraine' Moraine Ash	D	40 feet	Fairly fast growing, good lawn tree, casts light, filtered shade, disease resistant
Fraxinus oxycarpa 'Raywood' Raywood Ash	D	35 feet	Fast growing, disease and pest resistant
Pinus halepensis Aleppo Pine	E	30-60 feet	Moderate to rapid growth, thrives in heat and wind, open irregular crown at maturity
Pistacia chinensis Chinese Pistache	D	35-60 feet	Leaves brilliant red in fall, moderate growth, not particular about soil or water, spreading rounded crown
Tilia cordata Little-leaf Linden	D	30-50 feet 15-30 feet	Excellent lawn or street tree, hardiest linden, form is densely pyramidal
LARGE TREES (from 50 to 70 feet in height)			
Calocedrus decurrens Incense Cedar	E	75-90 feet	Symetrical, slow growing initially, deep, infrequent watering
Cinnamomum camphora Camphor Tree	E	50 feet or more	Slow growing, beautiful in any season
Ginkgo biloba 'Saratoga' Maidenhair Tree	D	50 feet or more	Slow growing, plant only male trees, disease and pest free, yellow fall color, attractive any season

LIST 2: Proposed Residential Street Tree Planting List

Scientific name / Common name	Evergreen/ Deciduous	Height to: / Width to:	Comments
SMALL TREES (to 35 feet in height)			
Acer buergerianum Trident Maple	D	20-25 feet	Low spreading growth, Outstanding fall color
Geijera parviflora Australian Willow	E	25-30 feet 20 feet	Moderate growth rate, small, graceful, deep rooted, needs water, full sun
Ilex altaclarensis 'Wilsonii' Wilson Holly	E	15-20 feet	Tolerates sun, wind, shade and any soil, bright red berries
Koelreuteria paniculata Goldenrain Tree	D	20-35 feet 10-40 feet	Slow to moderate growth, valuable in difficult soil, tolerates heat, wind and drought
Lagerstroemia indica Crape Myrtle	D	6-30 feet	Showy flowers in summer, slow growing, full sun
Laurus nobilis Sweetbay	E	12-40 feet	Tree or shrub, slow growing, bayleaf in cooking, needs good drainage, light shade
Magnolia soulangiana Saucer Magnolia	D	25 feet 25 feet	Blooms in spring before leaves expand, white to purplish red, does poorly in hot, windy areas
Maytenus boaria Mayten Tree	E	30-40 feet	Graceful, pendulous branches, slow growing, roots not invasive, choice lawn tree
Prunus blireiana Purpleleaf Plum	D	25 feet 20 feet	Leaves reddish purple, flowers semidouble, pink, fragrant, Feb.-April, no fruit
Pyrus kawakamii Evergreen Pear	E	small tree	Fast growing, white flowers in spring, partially deciduous
MEDIUM TREES (from 35 to 50 feet in height)			
Alnus cordata Italian Alder	D	40 feet 25 feet	Moisture loving, rapid growth, roots are invasive, interesting catkin display before leaves

LIST 3: Proposed Shrubs to Serve as a Hedge or as Screening

Scientific name / Common name	Evergreen/ Deciduous	Height to: / Width to:	Comments
Acacia decora / Graceful wattle	E	6-8 feet / 6-8 feet	Can be trimmed to 5 feet, drought resistant
Camellia japonica	E	6-12 feet / 6-12 feet	Many named varieties, requires good drainage and moist soil, slow growing
Chaenomeles / Flowering Quince	D	6-10 feet / 6-10 feet	Flowers appear in Jan. before the leaves, easy to grow
Choisya ternata / Mexican Orange	E	6-8 feet / 6-8 feet	Rapid growth, fragrant white flowers in early spring, informal hedge, needs fast drainage and light shade
Cocculus laurifolius	E	25 feet	Multistemmed shrub or small tree, slow growing, can be kept low by pruning, sun or shade
Coprosma repens / Mirror Plant	E	10 feet / 6 feet	Rapid growth, prune to achieve desired height and density, needs partial shade and ample water
Cotoneaster spp.	E or D	varies w/ species	Informal hedge, prune to enhance arching habit, don't plant near sidewalk
Coleonema spp. or Diosma / Breath of Heaven	E	5-10 feet / 5-10 feet	Fragrant when brushed or bruised, flowers pink or white, light soil, wispy, shear lightly, full sun
Euonymus spp.	E or D	varies w/ species	Valued for foliage, form, and texture
Elaeagnus spp.	E or D	varies w/ species	Large shrubs or trees, fast growing, dense, full, tolerates heat and wind
Garrya spp. / Silktassel	E	4-8 feet / 4-8 feet	Full sun, interesting flower tassels Dec.-Feb., tolerates heat and drought

LIST 2 (cont.)

Scientific name / Common name	Evergreen/ Deciduous	Height to: / Width to:	Comments
LARGE TREES (cont.)			
Liquidambar styraciflua / American Sweet Gum	D	60 feet	Moderate growth rate, good all-year tree, good fall color, can be pruned
Liriodendron tulipifera / Tulip Tree	D	60-80 feet / 40 feet	Fast growth, leaves turn yellow in fall, needs plenty of summer water and room, handsome
Magnolia grandiflora	E	60-80 feet / 40 feet	Dark glossy leaves, white, fragrant blossoms in summer and fall
Quercus ilex / Holly Oak	E	40-70 feet / 40-70 feet	Moderate growth rate, relatively pest and disease free
Quercus suber / Cork Oak	E	70-100 feet / 70-100 feet	Moderate growth rate, trunk and principal limbs covered with thick, corky bark which carves easily

LIST 3 (cont.)

Scientific name / Common name	Evergreen/ Deciduous	Height to: Width to:	Comments
Ilex cornuta Chinese Holly	E	10 feet 10 feet	Shrub, small tree, large long-lasting red berries
Ilex crenata Japanese Holly	E	3-4 feet 3-4 feet	Shrub, sun or shade, black berries, dense, erect
Juniperus spp. Junipers	E	6-20 feet	Shrubs, foliage needle-like or scalelike or both, many uses
Ligustrum japonicum Japanese Privet	E	10-12 feet	Shrubs or small trees, excellent hedges or screens
Mahonia aquifolium Oregon Grape (The scientific name has been changed to *Berberis aquifolium* and the species may be sold under either name)	E	6 feet	Tall, erect habit, any exposure, blue-black berries in March-May, edible, control height by pruning, spiny-toothed leaves
Pieris japonica Lily-of-the-Valley Shrub	E	9-10 feet	Upright, dense, tierd growth, partial shade, needs generous watering, flowers in drooping clusters, pink or white
Pittosporum spp.	E	6-25 feet varies w/ species	Good form and foliage, some species have fragrant flowers, sun or shade
Psidium cattleianum Strawberry Guava	E	8-10 feet	Moderate growth, beautiful bark, dark red fruit, good informal hedge
Viburnum spp.	D or E	4-20 feet varies w/ species	Sun or shade, often fragrant flowers, prune to prevent legginess, plant E in partial shade

Appendix B

Traffic Report

Right-of-Way

The current right-of-way (R/W) fo Ham Lane between Elm Street and Lodi Avenue is mostly 60 feet wide with a section of 80-foot ROW at Lodi Avenue. The existing street is mostly 44' to 48' wide and is not centered in the right-of-way.

Striping

This section of Ham Lane is currently striped with two travel lanes. Crosswalks are marked at intersections.

Control Devices

An eight phase traffic signal controls the Lodi Avenue and Ham Lane intersection and a four phase traffic signal controls the Elm Street and Ham Lane intersection.

Parking

Curbside parallel parking is allowed on street along both sides of Ham Lane from Lodi to Elm. The current onstreet parking capacity is approximately 135 spaces.

Traffic Volumes

The current traffic volume for this segment of Ham Lane ranges from 12,400 to 14,100 vehicles per day. Average daily traffic (ADT) volumes were calculated from counts taken by the City of Lodi on May 15th, 16th, and 17th which are a Tuesday, Wednesday and Thursday. These days were chosen because they represent the most "normal" traffic behavior and will present the best traffic volumes for an average day in Lodi. The peak hour traffic volumes were also calculated in the same manner. Existing peak hour traffic counts/traffic flows occur during the normal peak hours of (7:00 to 9:00 am and 4:00 to 6:00 pm). However, there is a secondary peak hour in the afternoon at the times that Lodi High School gets out

HAM LANE IMPROVEMENT PROJECT TRAFFIC ANALYSIS

by Jeff Clark

INTRODUCTION

This report summarizes present conditions and future traffic impacts to Ham Lane between Elm Street and Lodi Avenue in the City of Lodi. Three alternative improvement plans were evaluated. The analysis included the evaluation of existing and future land uses, traffic volumes, street cross-sections, channelization, and traffic control devices. Alternative improvement plans for Ham Lane were developed and analyzed using future peak-hour traffic projections, street capacities, physical constraints and parking demands.

EXISTING CONDITIONS

Ham Lane is one of the major north-south streets in Lodi. It terminates at Turner Road on its north end and at Harney Lane on the south end. The segment of Ham Lane analyzed in this study is from Elm Street to Lodi Avenue. It is four blocks long, and its location in Lodi is shown on Exhibit 1.

Land Uses

Current land uses along Ham Lane between Elm Street and Lodi Avenue vary from low to high density residential with some commercial near Elm Street.

4

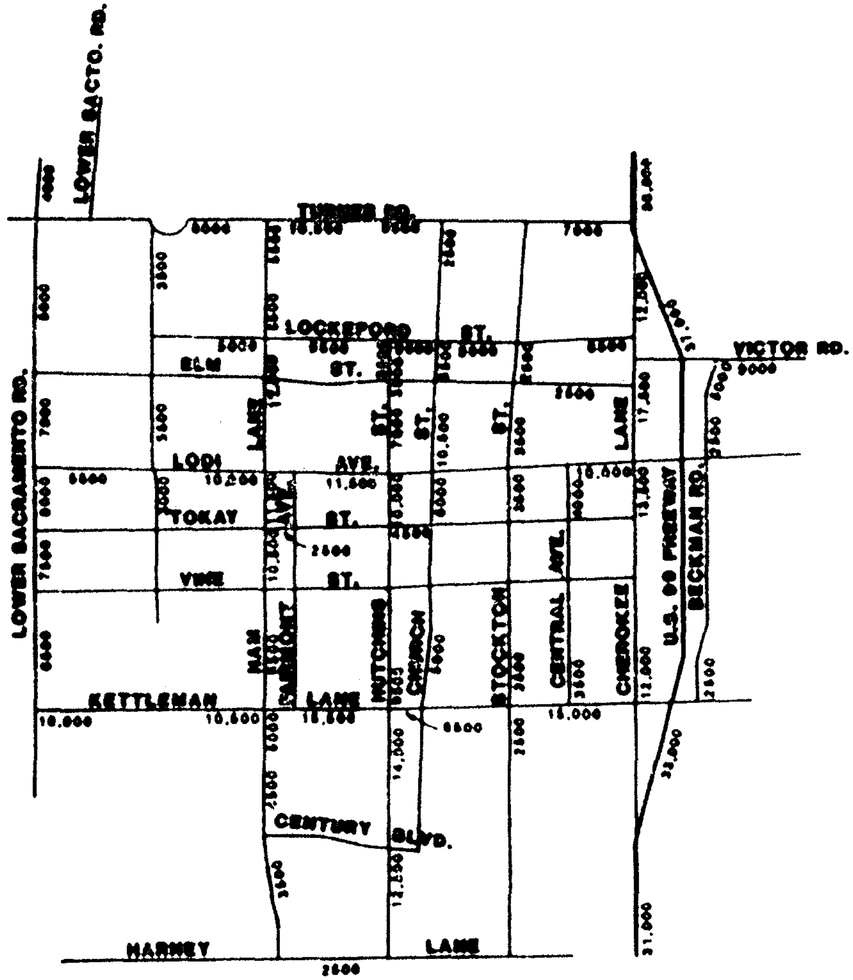


EXHIBIT 2

Average Daily Traffic Volumes (1980-1981)

5

EXHIBIT 1

Vicinity Map

FUTURE CONDITIONS

Traffic Projections

Traffic volumes were projected to the year 2005 for minimum, maximum and midrange values. The values were calculated using City of Lodi population growth rates, City of Lodi traffic counts, and City of Lodi General plan.

The minimum range values from the San Joaquin C.O.G. Traffic Study for Lodi were not used in this study because they were found to project future volumes lower than the existing 1984 traffic volumes.

The midrange traffic growth values were calculated using the historic population and traffic volume growth for the City of Lodi (1965-1984). An average rate of 1.7 percent was used to project traffic growth.

The maximum range was calculated using the historic growth rate in traffic volumes on Ham Lane (1965-1984). An average rate of 2.4 percent was used to project traffic for the section near Elm Street and 3.3 percent for the section near Lodi Avenue. The resulting traffic forecasts are based on the assumption that radical changes to the land uses in the area around Ham Lane would not occur and traffic volumes would increase at the same rate as they have in the past.

Exhibits 6 and 7 (presented later) show a comparison of the projected traffic volumes for the two ranges of projections to the three alternative roadway sections over time.

of session. This secondary peak occurs during the 1:00 p.m. to 3:00 p.m. hour and is especially heavy in the southbound Ham Lane direction. The traffic volume for this move is 570 vehicles per hour. The a.m. peak hours vary depending on the time of year. During the school months there is a 7:00-9:00 a.m. peak but during the summer months the peak occurs from 11:00-1:00 in the midday.

1979-1980 average daily traffic volumes are shown on Exhibit 2 for general comparison of traffic flow on streets throughout the City of Lodi.

Turning Movements

Turning movements for both the a.m. and p.m. peak hours for Ham Lane intersections at Elm Street and Lodi Avenue were calculated from field observations.

Capacities

The capacities of Ham Lane in this study of existing conditions is the capacity of the critical intersection of Ham Lane and Lodi Avenue.

Current City of Lodi traffic counts, peak hour turning percentages calculated from field observations, and the updated Highway Capacity Manual signalized intersection capacity calculation methodology were used to determine operating conditions. The level of service for the intersection of Ham Lane and Lodi Avenue was calculated to be L.O.S.A and for Ham Lane and Elm Street L.O.S. of A. However, it must be noted that during certain parts of the day the southbound approach to the Ham Lane/Lodi Avenue intersection appears, from field observations, to operate at LOS C or worse.

Improvements

Three alternatives for improvements to Ham Lane were evaluated. The three include:

I. Rebuild existing street (Alternative C), within the existing curb lines, improvements, such as restriping to add left-turn pockets, and limiting on-street parking would be done. Physical improvements would be limited to necessary curb repairs and pavement overlays. (See Exhibit 4)

II. Minor Improvements (Alternatives A & B). Some physical improvement to widen the existing roadway to accomodate a basic four-lane street. Channelization and limiting of on-street parking would also be needed. (See Exhibit 4)

III. Major improvements (Proposed Project). Major physical and channelization improvements, to accomodate a four-lane street with on-street parking. (See Exhibit 5)

These scenarios were then evaluated and alternative cross-sections were developed and analyzed.

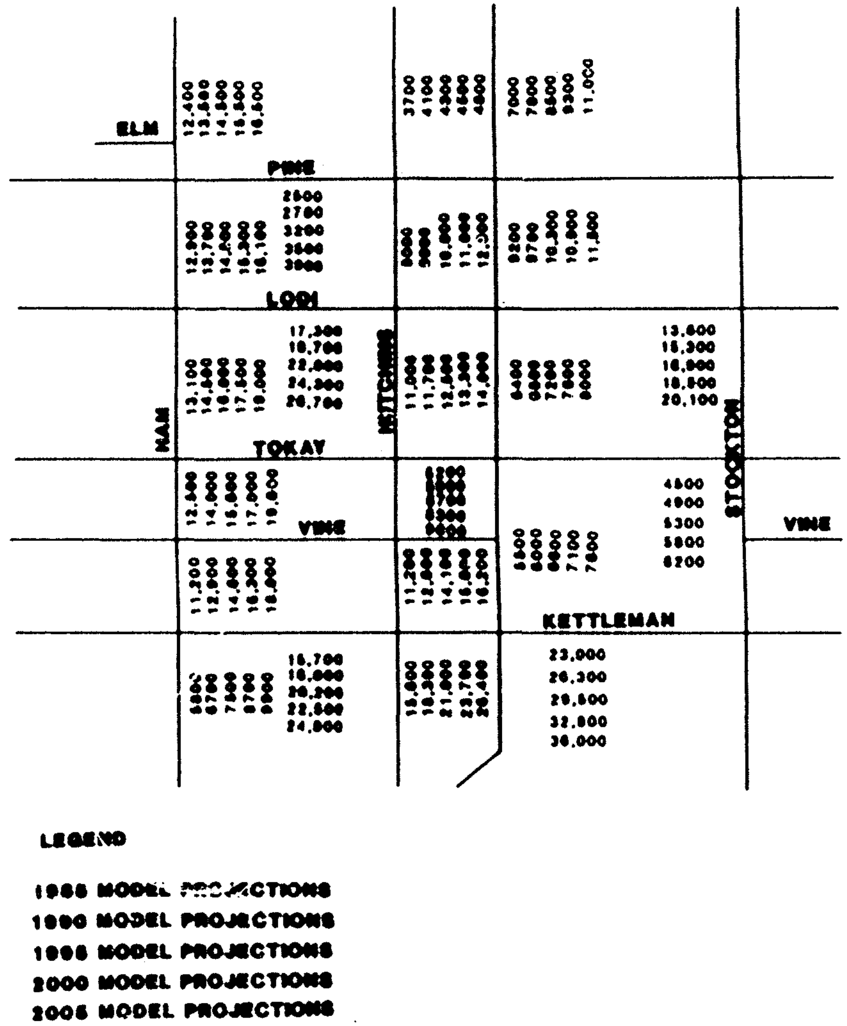
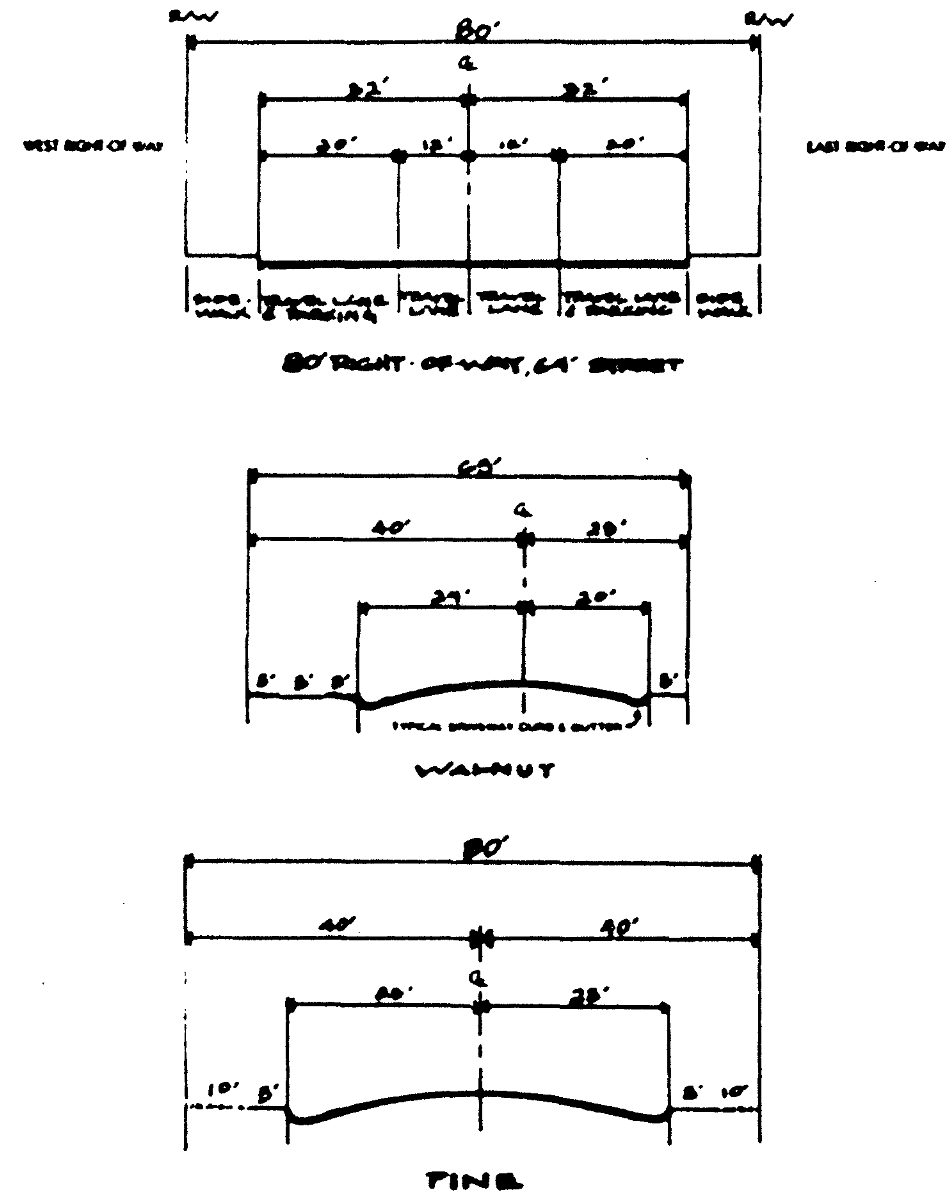


EXHIBIT 3

San Joaquin Council of Governments
Projected Traffic Volumes



NOTE ℄ IS A SECTION LINE AND NOT NECESSARILY THE CENTER LINE OF EXISTING ROADWAY

Ham Lane Section PROPOSED & EXISTING

Typical Mid Block

EXHIBIT 4

EXHIBIT 5

TRAFFIC ANALYSIS

The three potential improvement alternatives were analyzed for the segment of Ham Lane between Elm Street and Lodi Avenue.

Using roadway capacities, traffic demand, parking, through trip attraction, and the amount of right-of-way required as evaluating criteria, an analysis was conducted for each of the proposed Ham Lane improvement alternatives.

Rebuild Existing Street (Alternative C)

This alternative is an upgrading of the roadway within the limits of the existing curbs. Traffic control devices and pavement markings would be modified to improve capacity. Physical improvements would be limited to pavement repairs, overlays, utility improvements, and curb repairs.

Cross-Section

The roadway and right-of-way would be the same as the existing facilities. The current cross-section is mostly comprised of a paved roadway section of 44 to 50 feet. The roadway is not centered in a 64 foot right-of-way.

Parking

The improvements proposed in this alternative would reduce the amount of on-street parking spaces from 135 to 100. Thirty-five spaces would be eliminated for left and/or right turn lanes at approaches to intersections.

Through Trips

Minimal additional through trips would be attracted to Ham Lane in this alternative as no physical improvements are proposed for this segment. The effects on Ham Lane are shown on the low end of the curves on Exhibits 6-7.

Physical Improvements

The improvements proposed in this alternative would consist only of striping and traffic control changes. Three areas would be affected. At the intersection of Ham Lane and Elm Street a right-turn pocket would be added on the south leg of Ham Lane, at Ham Lane and Pine Street a left turn lane would be added on the north approach of Ham, and left turn pockets would also be added at both approaches to the Ham and Walnut intersection.

Capacities

A capacity of 840 vehicles per hour in the peak hour and peak direction was used. This capacity is based on a combination of midblock and intersection capacities. Analysis of roadway capacity and traffic demand (see Exhibit 6-7) reveals that Alternative 1 would operate under capacity for Level of Service B through the year 1995.

Minor Improvements (Alternatives A & B)

This alternative would provide improvements that are moderate in scale. Right-of-way acquisition and physical improvements would be limited to that necessary to provide a basic four-lane roadway with on-street parking prohibited or restricted to certain times of day.

Cross-Section

The proposed cross-section of 70 feet of ROW and 56 feet of roadway would be wide enough for a four-lane road. At intersection this cross-section would accommodate four through lanes

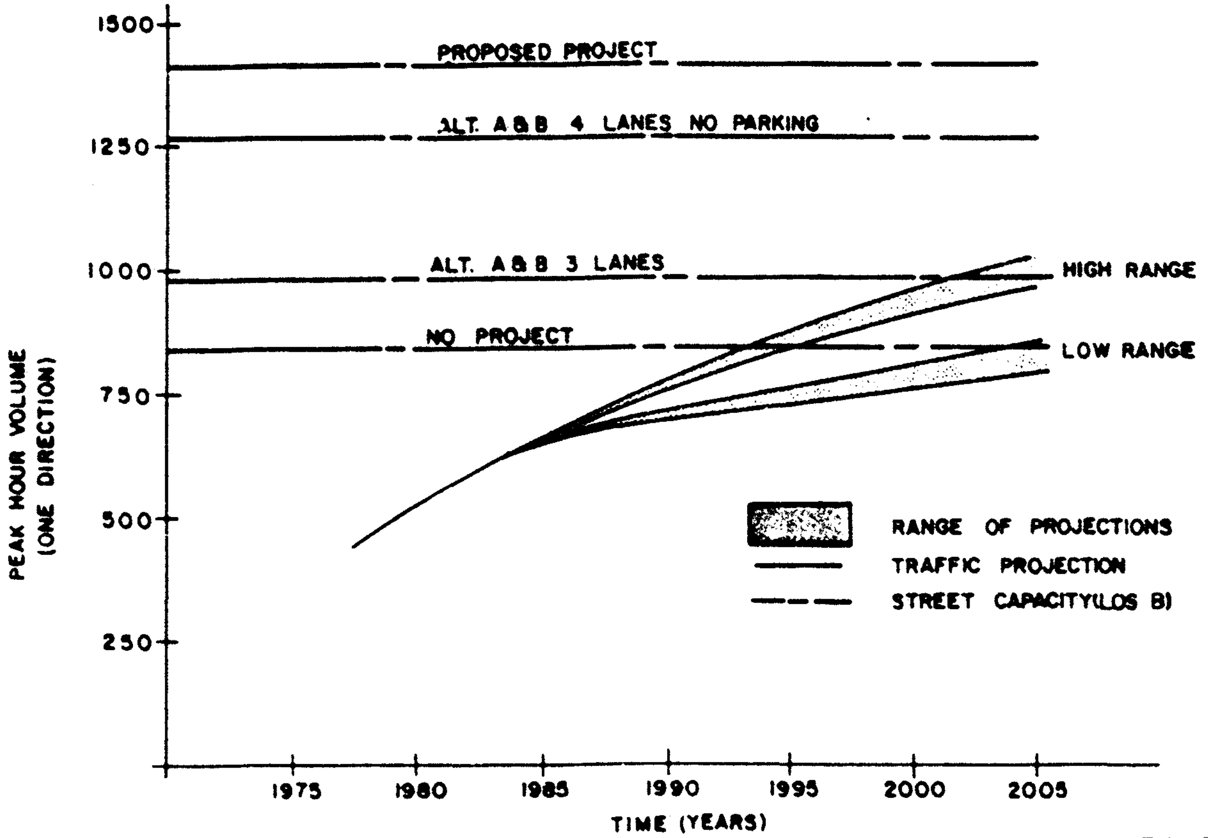


EXHIBIT 6

Traffic Projections and Street Capacities
Lodi to Pine

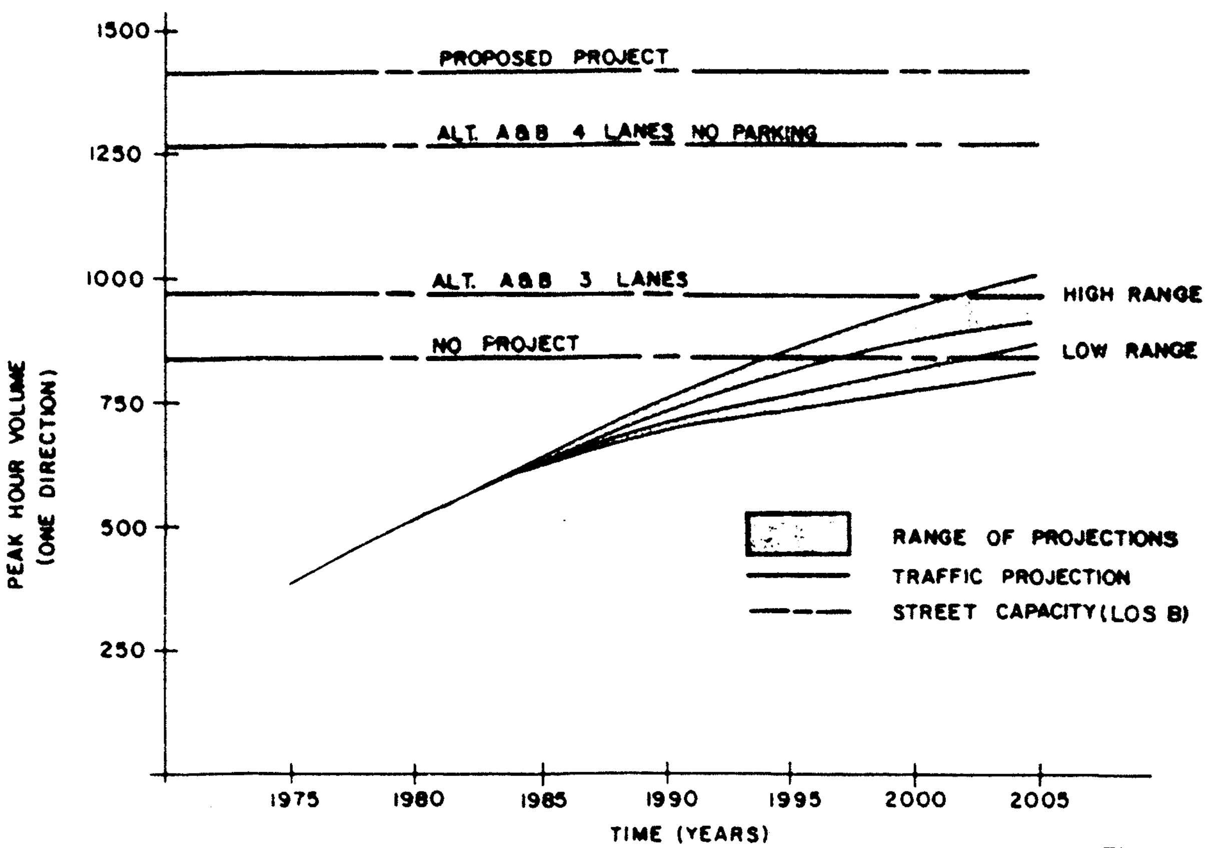


EXHIBIT 7

Traffic Projections and Street Capacities
Pine to Elm

and evaluating a service area for several north south arterials. Improvements to Ham Lane and its traffic control devices would reduce travel time and would attract trips that may have used other parallel facilities as routes between North Lodi and South Lodi/Stockton.

The additional 1,000 daily trips would add about 150 trips in the peak hour to the study section of Ham Lane. However, th peak direction for the through trips would be opposite the current peak direction for that segment, so only 50 trips would be added to the peak flows. The effects on Ham Lane south of Elm Street would be near the mid-range of the curves indicated on Exhibits 6 and 7.

Physical Improvements

For Ham Lane to be widened to 56 feet, it would have to be widened 4 to 6 feet on both sides of the roadway or 8 to 12 feet on either side. An additional 6 feet of R/W would have to be acquired to improve the current street to the proposed Alternative II cross-section. New curbs and gutters, some sidewalks and pavement areas would be required. An overlay of the existing pavement would probably be necessary.

Capacity

The 56-foot, four-lane section provides a capacity of 1,270 vehicles per hour at Level of Service (L.O.S.) B during the peak hour in the peak direction. (Use of LOS C as a design criteria increases capacity by 10-15%). This is enough capacity to handle all the projected traffic demands for this segment of Ham Lane through the year 2005 at the design L.O.S. B. The three-lane section provides a capacity of 970 vehicles per hour in the peak direction and would handle all the projected traffic demands through the year 1998 at LOS B.

and a left-turn pocket, with substandard lanes. On street parking would be possible only at times when four traffic lanes were not required.

The 56-foot section does give a lot of staging flexibility. A three-lane section with on-street curbside parking, two travel lanes, and a continuous left-turn lane could also be accommodated.

Parking

In order to limit physical improvements and increase capacity, a majority of the unrestricted on-street parking would either be eliminated or converted into restricted parking. About 35 parking spaces would be eliminated. About 100 would be converted to restricted time parking and there would be no unrestricted spaces. In the restricted time parking space, parking would be allowed only during off-peak hours when the four-lane roadway was reduced to the center two lanes. The hours when parking would be prohibited would generally be from 7:00 to 9:00 in the morning and 2:00 to 6:00 in the afternoon.

If the three-lane roadway section were implemented, unrestricted on-street parking could be provided along both sides of the street.

Through Trips

It is estimated that development of this alternative cross section could attract about 1,000 through trips from nearby, parallel arterials, primarily Hutchins Street and lower Sacramento Road. This would represent a 5-percent increase in year 2005 traffic on Ham Lane between Elm and Lodi.

This number was calculated by determining the existing difference in travel time between competing corridors, estimating how changes to Ham Lane would affect the travel time difference,

Proposed Project

Major physical improvements and right-of-way acquisition would be needed to implement this alternative. Necessary improvements to accommodate a four-lane roadway with parking on both sides of the street are described below. This alternative would bring this section of Ham Lane up to the cross-section of the rest of Ham Lane.

Cross-Section

An 80-foot row with a 64-foot pavement section is proposed. This section would consist of four travel lanes with parking on-street for midblock section, and four travel lanes and a left-turn pocket at intersections. A sidewalk would be provided on both sides of the street.

Parking

Unrestricted on-street parking would be allowed at midblock locations. This would provide about 75 unrestricted on street parking spaces between Lodi and Elm.

Through Trips

Using the same methodology as outlined in the through trip section of the previous alternative evaluation, it was determined that the proposed project improvements on Ham Lane would attract about 1,500 vehicles per day. This would be an increase of about 7 percent in year 2005 traffic volumes on Ham Lane between Elm and Lodi. This would add 100 vehicles per hour to the peak direction in the peak hour to the other segments of Ham Lane. The high range of the curves on Exhibits 6 and 7 indicate the effects on operating conditions for the segment of Ham Lane in this study.

Physical Improvements

To develop the proposed project cross-section the current roadway would have to be widened 8 to 10 feet on both sides, and 15 + or - feet on either side of R/W would need to be acquired. New curbside gutters, sidewalks, and pavement areas would be required. An overlay of the existing pavement would probably be necessary.

Capacity

With a capacity of 1,410 vehicles per hour during the peak hour in the peak direction the Alternative III cross-section would handle all the traffic demands to the year 2005 at a Level of Service A.

IMPACTS AND MITIGATION

Roadway Capacity

Traffic volumes will continue to increase in the future on Ham Lane as the City of Lodi continues to grow. As the traffic levels increase so will the levels of congestion. Currently the section of Ham Lane between Lodi Avenue and Elm Street operates at a level-of-service (LOS) A. This is projected to change as traffic volumes increase. Table 4 shows a comparison of the roadway cross section alternatives and the level-of-service that is projected for each roadway alternative versus three projected year 2005 traffic volumes. As can be seen from Table 4 all four cross-section/lane configuration alternatives will handle the projected minimum traffic levels at a LOS B or better through the year 2005. However, for the maximum level of traffic projected the existing and three-lane 56 foot cross-sections will experience periods of sub-level-of-service B and the existing cross-section will even experience periods of LOS D. Table 5 presents definitions of level-of-service operating conditions.

Mitigation

To eliminate any potential reductions in level of service below LOS C the section of Ham Lane between Lodi Avenue and Elm Street should be widened to a minimum of 56 feet curb to curb.

High School

Access to the Lodi High School is available off of Ham Lane. Because of this there is a secondary peak in traffic levels between 1:00 and 3:00 in the afternoon. This peak is nearly as high as the 4:00 to 6:00 peak hours and in the southbound direction causes traffic levels high enough to reduce the level-of-service on the study section, at the Ham and Lodi intersection southbound approach, to level of Service C or less, for the existing cross-section.

Mitigation

To mitigate the impacts of high school traffic a wider cross-section should be constructed to prevent any decrease in level-of-service below LOS B.

Pedestrian Safety

Due to an estimated increase in traffic speeds, higher volumes, and greater distances to cross, pedestrians will have to wait longer for adequate gaps in traffic to make a safe crossing. School children, Junior High School or younger and senior citizens are the most affected pedestrians.

Mitigation

Additional pedestrian safety devices may be needed. These would include additional crosswalks, roadway warning signs, school speed zones, and if necessary, traffic or pedestrian signals.

Cross Traffic

Because of higher traffic volumes and (if the proposed project is implemented more lanes to negotiate),cars on the side streets may have to wait longer to find a safe gap in traffic to make either left turns or to cross Ham Lane. Because of the high percentage of high school age drivers this problem could become more critical due to the inexperience of the young drivers causing traffic safety problems.

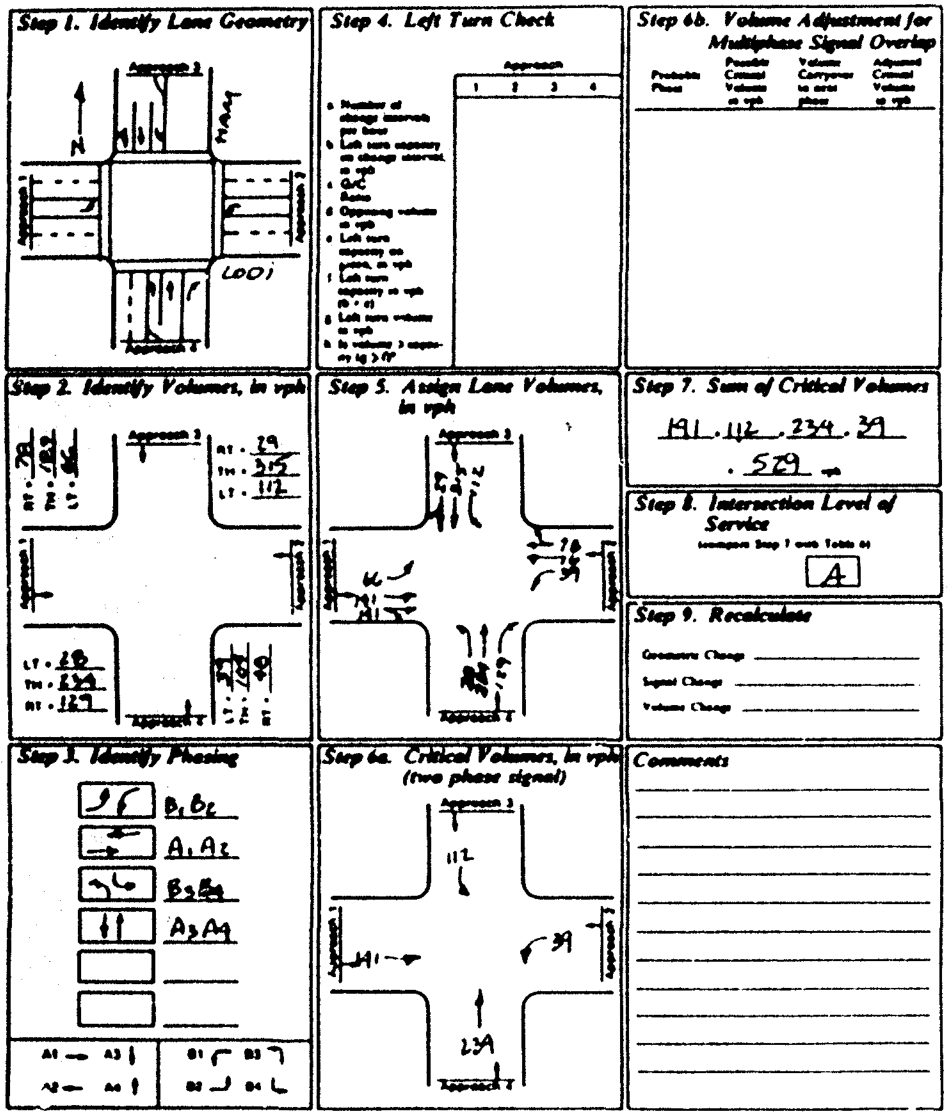
Mitigation

Traffic signals would be installed as warranted. This would give the right-of-way to the vehicles on the side streets so they could make the desired traffic movements. The 4-lane 56 foot section would aid the cross street vehicles by increasing sight distance through the removal of on-street parking.

Critical Movement Analysis: PLANNING
Calculation Form 1

Intersection LODI AVE / HAM LANE **Design Hour** 8:00 - 9:00AM

Problem Statement ____________



Vehicle Speeds

With any widening of the roadway cross-section, drivers may perceive the road to be safer to drive at higher speeds, thus overall vehicle speeds may increase. This is especially true with the large mix of high school drivers.

Mitigation

Speed limit signs and enforcement by local police can help to reduce speeds, however, even these measures may not be entirely successful.

Critical Movement Analysis: PLANNING

Calculation Form 1

Intersection LODI AVE / HAM LANE **Design Hour** 4:50 - 5:50 PM

Problem Statement ______

Step 1. Identify Lane Geometry

Approach 1, Approach 2, Approach 3, Approach 4 — N — LODI — HAM

Step 4. Left Turn Check

- Number of change intervals per hour
- Left turn capacity on change interval, in vph
- G/C Ratio
- Opposing volume, in vph
- Left turn capacity on green, in vph
- Left turn capacity in vph (b + e)
- Left turn volume in vph
- Is volume > capacity (g > f)?

Step 6b. Volume Adjustment for Multiphase Signal Overlap

Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

Step 2. Identify Volumes, in vph

Approach 3: RT · 25, TH · 209, LT · 61

Approach 4: LT · 84, TH · 292, RT · 84

Step 5. Assign Lane Volumes, in vph

34, 180, 73

Step 7. Sum of Critical Volumes

34 + 61 + 180 + 292 = 567 vph

Step 8. Intersection Level of Service

(compare Step 7 with Table 6)

A

Step 9. Recalculate

Geometric Change ______

Signal Change ______

Volume Change ______

Step 3. Identify Phasing

B1 B2

A1 A2

B3 B4

A3 A4

A1 → A3 ↓ B1 ↱ B3 ↰

A2 ← A4 ↑ B2 ↲ B4 ↳

Step 6a. Critical Volumes, in vph (two phase signal)

Approach 3: 61; Approach 1: 34; Approach 2: 180; Approach 4: 292

Comments

______

Critical Movement Analysis: PLANNING

Calculation Form 1

Intersection LODI AVE / HAM LANE **Design Hour** 1:40 - 2:40 PM

Problem Statement ______

Step 1. Identify Lane Geometry

Approach 1, Approach 2, Approach 3, Approach 4 — N — LODI — HAM

Step 4. Left Turn Check

- Number of change intervals per hour
- Left turn capacity on change interval, in vph
- G/C Ratio
- Opposing volume, in vph
- Left turn capacity on green, in vph
- Left turn capacity in vph (b + e)
- Left turn volume in vph
- Is volume > capacity (g > f)?

Step 6b. Volume Adjustment for Multiphase Signal Overlap

Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

Step 2. Identify Volumes, in vph

Approach 3: RT · 63, TH · 454, LT · 249

Approach 4: LT · 47, TH · 276, RT · 139

Step 5. Assign Lane Volumes, in vph

43, 142, 81, 179, 174, 21

Step 7. Sum of Critical Volumes

81 + 47 + 454 + 142 = 724 vph

Step 8. Intersection Level of Service

(compare Step 7 with Table 6)

A

Step 9. Recalculate

Geometric Change ______

Signal Change ______

Volume Change ______

Step 3. Identify Phasing

B1 B2

A1 A2

B3 B4

A3 A4

A1 → A3 ↓ B1 ↱ B3 ↰

A2 ← A4 ↑ B2 ↲ B4 ↳

Step 6a. Critical Volumes, in vph (two phase signal)

Approach 3: 454; Approach 1: 142; 81; Approach 4: 47

Comments

BY ADDING A LONGER SB LEFT TURN POCKET AND RIGHT TURN/THRU LANE THE INTERSECTION VPH IS 529.

Appendix C

Noise Analysis

Environmental Consulting Services

Noise
Air Quality
Energy

20430H Town Center Lane
Cupertino, CA 95014
(408) 257-1045

NOISE IMPACT AND MITIGATION STUDY

HAM LANE IMPROVEMENT PROJECT

City of Lodi, CA

August 27, 1984

Submitted to

Kate Burdick Land Use Planning

Auburn, CA

Prepared by

M. STANTON SHELLY

Principal Consultant

NOISE IMPACT STUDY - HAM LANE IMPROVEMENT PROJECT

INTRODUCTION

The Ham Lane Improvement Project is within the jurisdiction of the City of Lodi, as lead agency. This noise study is part of the Environmental Impact Report required by the California Environmental Quality Act, Public Resources Code section 21000.

I. EXISTING SETTING

A. Noise Sources in the Area

The primary source of noise in the project area is traffic on local streets, both on Ham Lane and on major cross streets such as Lodi Avenue and Elm Street. Peak passby noise levels for passenger vehicles are approximately 60-70 dBA at moderate speeds and at a distance of 25 feet. (See the Appendix for definitions of noise concepts and terminology.) Heavy trucks, motorcycles, and vehicles with faulty muffler systems produce peak passby noise levels of 70 to 90 dBA at 25 feet. Other sources of noise in the area -- overflying aircraft, barking dogs, and similar urban disturbances -- are present, but not significant contributors.

More distant sources, Southern Pacific Railroad activities one and a half miles east and Route 99 traffic two and a half miles east, contribute to the background level, and are noticeable in the absence of noise from nearby sources.

B. Ambient Noise Levels

The traffic noise level at a given location is a combination of many factors, including the traffic volume, the noise level of each vehicle, vehicle speed, and the distance to the road. As most urban dwellers are aware, the traffic noise level near a busy street varies over a wide range. To indicate easily the overall noise level, single number descriptors are usually used. The most common descriptor for a short period is the hourly L_{eq}, which indicates the energy average of the varying noise level, and has been shown to be a good indicator of people's perceptions of noise level. Over a longer period, the L_{dn} descriptor is used, which is the long-term average of L_{eq}, with 10 dB added to the noise level for the nighttime period.

With basic information about local traffic, the roadside noise level can be modeled (computed) fairly accurately, using equations that have been developed from field tests. The standard Highway Research Board traffic noise model (Reference 4), revised after extensive field measurements, has been used for this study. Roadside noise levels are estimated below for existing traffic on Ham Lane, at 40 feet from the center of the street (approximately the middle of the average yard).

Present Ham Lane Noise Levels (dBA)

LOCATION	Leq Pk Hr.	Leq Noon	Leq 1 am	Ldn
Front yards	71	70	58	72

These noise levels are based upon an Average Daily Traffic (ADT) volume of 12,500, and a peak hour volume of 1050 trips. The noise levels during periods other than the peak hour, and the L_{dn}, are based upon typical hourly variations of urban traffic throughout a normal day. Because of the relatively small front yards, and the reflection of noise from the houses, the noise levels are not substantially different at the houses than at the sidewalk (1-2 dBA less).

II. POTENTIAL NOISE IMPACTS OF THE PROJECT

A. Sensitive Receptors.

The majority of properties adjacent to Ham Lane in the project area are residential, with a few commercial uses and a church making up the remainder. Most of the residences are single- family, but a few are apartments and duplexes. There is only 100- 120 feet separating the homes on the West side of Ham Lane from those on the East side, so the distance to traffic is relatively small.

B. Project Traffic Noise Impacts

The project would construct four traffic lanes, plus either two parking lanes or a center turn lane, depending on the location. Traffic volumes have been projected in three growth scenarios between 1985- 2005, from minimum increases to high growth. Five basic project cases are evaluated for potential noise impacts, as shown below:

1. Four traffic lanes, two parking lanes
   Volume: 15300 ADT (1985 High growth)

2. Four traffic lanes, two parking lanes
   Volume: 20300 ADT (1995 High growth)

3. Four traffic lanes, two parking lanes
   Volume: 25300 ADT (2005 High growth)

4. Four traffic lanes, center turn lane
   Volume: 25300 ADT (2005 High growth)

5. No Project - Two traffic lanes
   Volume: 25300 ADT (2005 High growth)

Average traffic speeds are estimated at 30 mph during peak hour, and 35 mph at other times, in cases 1 through 4. Case 5 would be seriously congested; speeds of 20 mph or less during peak hour, and 25 mph otherwise, are assumed.

Traffic data are from the project traffic study by TJKM Traffic Consultants, Sacramento. The long- term L_{dn} descriptor was computed from a typical urban hourly traffic distribution (see Appendix page A-1).

The results of the noise modeling studies are given in Table 1 below. The front-yard location in each case is the same as for the ambient noise levels in the previous section, 40 feet from the center of the road.

Table 1 - HAM LANE ROADSIDE NOISE LEVELS (dBA)

CASE	L_{eq}	L_{dn}
1. 1985 - 4 lane, 2 parking	72	73
2. 1995 - 4 lane, 2 parking	73	74
3. 2005 - 4 lane, 2 parking	74	76
4. 2005 - 4 lane, 1 turn	76	77
5. 2005 - 2 lane (existing)	69	71

The cases modeled do not include all possible combinations of volumes and lane configurations. For example, the cases covering only modest traffic growth in the next 20 years are not presented. However, the cases which have the highest noise potential are included. If the high- growth traffic projections do not occur, lower noise levels would be generated.

Table 1 demonstrates the relative effects of traffic volume, average vehicle speed, and distance on the noise level, when compared to present noise levels. Traffic in the basic project

cases (#1, 2, 3) is about 10 feet closer than for the present two- lane configuration. Noise levels increase due to progressively higher volumes.

Cases 3, 4, and 5 have the same high- growth volume, while road cross- section (and receptor/vehicle distance) changes. Case 4 eliminates two outer parking lanes for a center turn lane, which brings the moving vehicles another 7 feet closer to the residential receptors, and increases noise levels by 1-2 dBA.

Case (#5) is No-Build in 2005. The distance is the same as at present, and because of congestion and low average speeds, noise levels would be 5-6 dBA less than for the 2005 Project cases.

It should be noted that receptors not on Ham Lane, behind those directly facing the project, are exposed to 14-18 dBA less noise because of the combination of greater distance and the partial shielding provided by the buildings. The <u>changes</u> in project traffic noise for other receptor locations would be approximately the same as for those located on Ham Lane. However, Ham Lane traffic is <u>not</u> a dominant source of noise for receptors on other streets.

C. Discussion of Potential Project Traffic Noise Impacts

Two aspects are important when considering potential noise impacts of a project: the increase in noise level due to the project, and the project noise level itself.

From Table 1, traffic noise along Ham Lane could increase 3 to 5 dBA in the next 20 years with project implementation. In general, noise increases of 2 dBA or less usually are not noticable, unless the character of the noise is also changed significantly. Noise increases of 3 - 5 dBA are definitely noticeable, and are potentially disturbing. The character of the noise is again important in the amount of disturbance caused. In the Ham Lane case, a 5 dB increase in steady traffic noise over 20 years might not cause problems (it is typical in many urban locations). However, an increase in individual loud vehicles could cause considerable disturbance.

To evaluate the potential impact because of the overall noise level, land use planning guidelines for noise are used. The City of Lodi has adopted the San Joaquin County Noise Element (Reference 5), which recommends compatible uses for various noise levels. The suggested L_{dn} noise levels for residential land uses are outlined in Table 2.

Table 2 - Recommended Noise levels for Residential Uses

LAND USE CATEGORY	L_{dn} RANGE
Normally Acceptable	Less than 60 dBA
Conditionally Acceptable	55 - 70
Normally Unacceptable	70 - 75
Clearly Unacceptable	Above 75

The guidelines are intended to assist in decisions about new residential construction, but they are useful in evaluating existing uses also. In terms of Noise Element guidelines, present noise levels adjacent to Ham Lane exceed recommendations, and the project would increase tho.e levels 2 to 5 dBA. In addition, acceptable interior noise levels should be less than 45 dBA L_{dn} due to exterior sources. This requirement is contained in State Title 25 - Section 1092, Noise Insulation Standards, which apply to any new multi-family residential construction.

Standard residential building design and construction methods generally reduce outdoor noise by 20 to 25 dBA, with windows closed and no significant cracks or openings around windows or doors. With the best residential construction

methods, and traffic noise levels of 70 dBA, Ham Lane interior noise levels would meet 45 dBA (L_{dn}) indoor standards. However, if windows are opened, interior noise levels will be only 10 to 15 dBA less than outdoors. This means that to achieve a 45 dBA interior noise environment, windows should be sealed, and forced ventilation provided. To deal with noise levels higher than 70 dBA, other improvements to the structures could be needed. See Section III, Mitigation Measures.

D. Construction Noise

The initial site pre[illegible] phases would bring various types of demolition and excavation ma.hines to the site, such as bulldozers, backhoes, and large dump trucks. These generally have diesel engines and produce 80 to 90 dBA at a distance of 50 feet under full load. Jackhammers would be utilized for concrete and blacktop removal, which generate 85 to 90 dBA noise levels at 50 feet.

Second phase activities require similar equipment, and produce similar noise levels. After removal of the existing road surface, curbs, and sidewalks, the surface would be graded. Trucks would bring in the base materia s to graded and rolled. Blacktop trucks and concrete mixing trucks bring the top surface materials. Final surface preparation by large rollers produces noise levels of 85 to 95 dBA at 50 feet.

The residential properties along Ham Lane would be the primary receptors for the temporary construction noise. For a period of four to eight weeks, sporadic noise levels of 80 to 90 dBA would be experienced. Although construction equipment wo.ld be idling part of the time, and would be producing maximum noise levels infrequently0, intermittant construction noise disturbance is likely on all adjacent properties.

Supplement to Ham Lane Noise Impact and Mitigation Study

Discussion of Low Barrier for Traffic Noise Mitigation

In most roadside receptor situations, with a setback of at least 35 feet from the roadway, a 2 1/2 foot barrier at the sidewalk would provide 3-4 dBA noise reduction on the first floor of the residences and in the part of the front yard near the house.

On Ham Lane, with setbacks from the curb of only 10- 20 feet, the view of the road surface (where much of the noise is generated) would not be significantly blocked by the barrier, and a reduction in noise level of 1-2 dBA would not be perceived as a noticeable noise reduction.

HSS

H. Stanton Shelly
Acoustical Consultant
9/12/84

III. MITIGATION MEASURES

The following mitigation measures are possible alternatives for reducing Nam Lane Improvement Project noise impacts. Each must be evaluated with respect to other project objectives such as budget, aesthetics, schedules, and City policies.

Traffic Noise

1. Although often undesirable for traffic engineering reasons, reducing average speeds on Nam Lane would reduce noise levels effectively.

2. Reduce local traffic volumes by improving desirability of alternatives to the automobile, such as car pools, bicycle, and public transit.

3. Construct a low masonry barrier (2 - 2½ feet high) along the front of residential properties. This would provide about 3 dBA of noise reduction without enclosing the yard or impairing the view.

4. Enforce California Vehicle Code prohibitions against faulty or modified loud exhaust systems -- Sections 27150 and 27151. This can be implemented by local law officers without noise monitoring equipment to eliminate the worst offenders.

Construction Noise

1. Choose construction equipment which is of quiet design, has a high quality muffler system, and is well-maintained.

2. Install superior mufflers and engine enclosure panels when required on gas, diesel or pneumatic impact machines.

3. Restrict hours of use for motorized equipment -- for example, 7:30 am to 5:30 pm, Monday through Friday.

4. Elim.nate unnecessary idling of machines not in use.

5. Use good maintenance and lubrication procedures to reduce operating noise.

Architectural and Structural Modifications

1. Windows facing major streets should either be tightly sealed and caulked (with the associated interior venilation system), or have a tight fit when closed, to shut out exterior noise.

2. Improve window noise reduction by replacing single-pane windows with double pane, or "safety" laminated, types.

3. Doors facing noise sources should be solid core with a tight fit when closed (weatherstripped), and no mail slots or other openings.

Impact: Temporary decrease in local air quality due to generation of dust during project construction.

During the grading and construction phase, dust may be produced, particularly during the dry months of the year. However, this impact is temporary and will be limited to the time of construction.

Mitigation

19. Minimize generation of dust and particulates through standard sprinkling/watering applications on dusty working areas at least once a day.

Land Use

EXISTING CONDITIONS

Land uses within the project area consist of a mix of predominantly residential and some commercial. Forty-eight single family homes, a 26-unit apartment building and two duplexes front Ham Lane between Lodi Avenue and Elm Street. A church, nursery and veterinary hospital are the only non-residential uses abutting the street within this area. The applicable zoning establishes a 20-foot setback for all uses in the project area. The project area is characterized by older, well maintained homes and landscaping. The larger, older trees provide shade and create a pleasant visual quality associated with tree-lined streets.

Land uses along Ham Lane north and south of the project area are also a combination of residential and commercial uses. The area along Ham Lane north of Elm Street is primarily low density residential, except for a commercial section at Ham Lane and Lockeford Street, where stores, restaurants and gas stations are located. South of Lodi Avenue there is a mix of residential and office uses. A medical complex is currently under construction on the southwest corner of Ham Lane and Lodi Avenue. Lodi Avenue High School is located west of Ham Lane between Lodi Avenue and Elm Street.

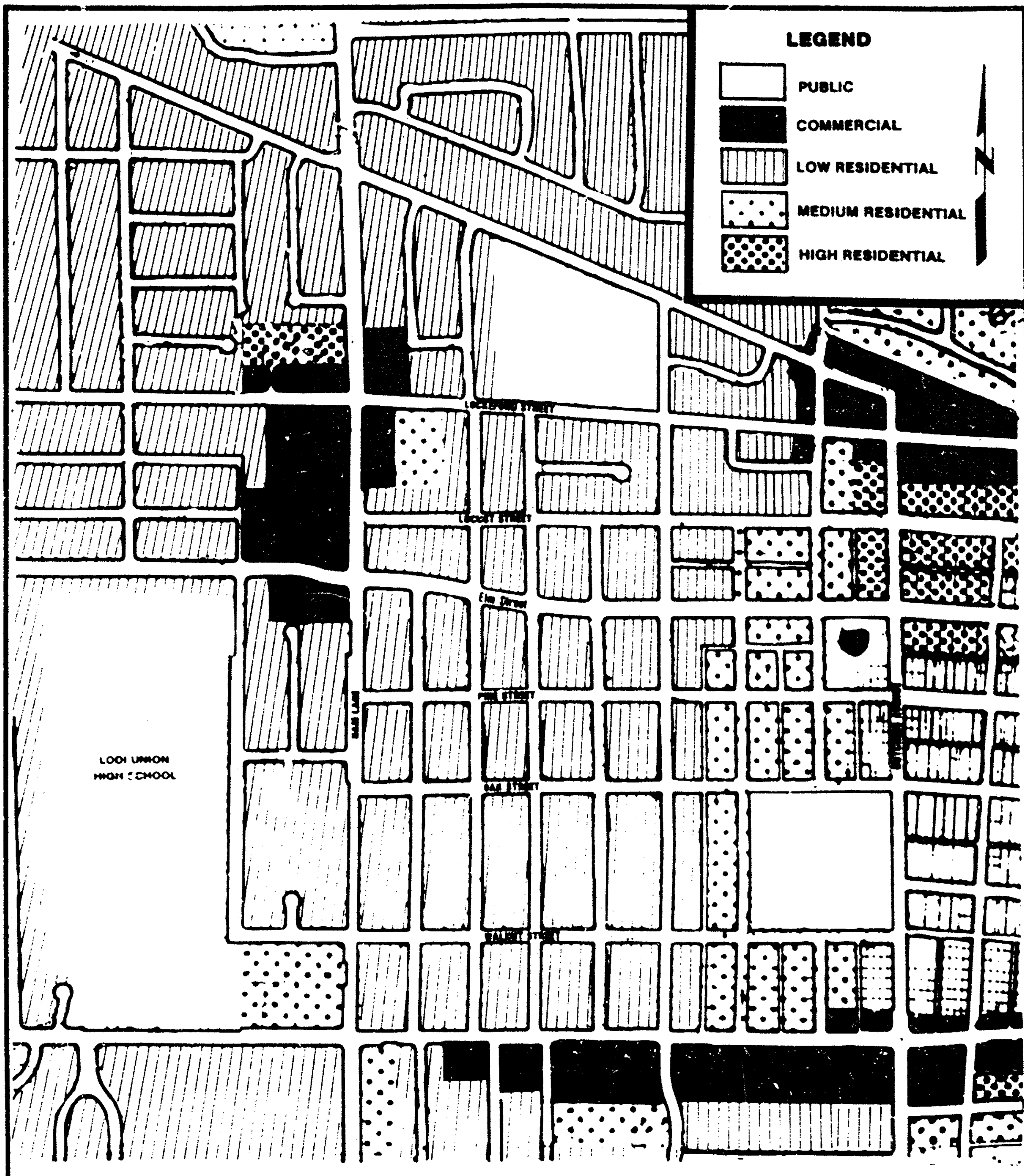
The City's General Plan guides future land uses in the project area and vicinity. The area basically has developed according to the General Plan designations for the area which are shown on Figure 8. The surrounding area is predominantly developed and the last major vacant parcel is currently being developed along Ham Lane south of Lodi Avenue (Morimoto, Personal Communication, 1984). There is also room for Lakewood Shopping Center to expand westward on Elm Street. The proposed Ham Lane Improvement Project is consistent with the City's General Plan.

IMPACTS AND MITIGATIONS

Impact: Change in the perceived neighborhood character.

Because the proposed project is consistent with the City's General Plan, and the project area and immediate vicinity are basically developed, no new development or population shifts will be generated as a result of this project. Development patterns to the north and south of the project area are well established, also in accordance with City plans. Therefore, the issue of concern is how the 4-block neighborhood character will be changed as a result of the project.

Street widening will result in the loss of trees and lanscaping which would serve to reduce shade and alter the visual character of the project neighborhood. Front yards would be reduced to an average depth of about 14 feet (CH2M Hill, 1978). The average distance from homes to the parking lane would be reduced by one to ten feet. As a result, project area residents probably would be more aware of street traffic and feel a loss of privacy, as their



Ham Lane Land Use

Figure 8

homes would be closer to the street. In addition, there may be future difficulties with resident access to their homes as traffic increases, and other potential traffic hazard concerns.

Mitigation

20. Replant street trees and shrubs compatible and/or identical with those removed, as outlined in Mitigation Measures #1 through #3.

21. Provide crosswalks and traffic signals or stop signs to minimize potential traffic safety hazards.

22. Insure that proper visibility from resident driveways is maintained when street trees are replanted.

23. Consider installation of automatic garage door openers where necessary to provide safe access.

24. The reduction of speeds along Ham Lane, coupled with the installation of double pane nonopening windows and other structural modifications as outlined in Mitigations #10 through #14, will serve to partially reduce noise impacts to residents.

25. Consider provision of four-feet high fence or lattice to provide a sense of resident privacy. This could require variances for both height and setback depending on the location.

Construction Related Impacts

EXISTING CONDITIONS

The proposed road construction will occur in two phases. First, the existing curbs, gutters and sidewalks will be removed from each side of the street and the new facilities will be installed. It is estimated that it will take two to four weeks per block for this removal and replacement, during which time the street will remain open. The second phase consists of repaving and restriping the entire four-block section of Ham Lane. This will take approximately three to four weeks to complete, during which time the street will be closed to through traffic, but homeowners will be granted access. Typical equipment to be used include backhoes, scrapers, graders, compacters, pavers, miscellaneous trucks (gravel, concrete, asphalt), and jackhammers. Water trucks will water unpaved sections as the work progresses. Hours of construction will be scheduled generally between 7:00 A.M. and 4 P.M. weekdays.

Construction-related impacts resulting from the proposed project will be of five general categories: traffic disruption and congestion and parking loss, noise generation, degradation of local air quality, disruption of area businesses, and potential disruption of subsurface utilities. The Traffic, Noise and Air Quality sections of this report describe existing conditions related to these concerns. There are three non-residential uses in the project subject to potential business disruption: a nursery, a veterinary hospital, and a church. Subsurface utilities include water and sewer lines and are located within the street.

IMPACTS AND MITIGATIONS

Impact: Local traffic disruption and loss of parking.

Although the project section of Ham Lane will be closed for 3 to 4 weeks during construction, detouring can alleviate traffic congestion along Ham Lane. However, minor inconveniences will be be experienced by local residents during this period. The street will be open to residents, even when closed to through traffic. However, there will be a temporary loss of driveway access for 1 to 3 days during reconstruction of sidewalks, curbs and gutters. During construction, a temporary loss of street parking will also result.

Detouring local traffic during construction will create minor inconveniences for neighboring streets, which will experience a temporary increase in traffic. Emergency access for fire, police and ambulance services also will be disrupted during the construction period.

Mitigation

26. Plan detour routes for minimal disruption surrounding neighborhoods.

27. Notify emergency services (fire, police, ambulance) of street closure and detour routes in advance of construction.

28. Plan construction around peak traffic times if possible, and complete constructi n in as timely a manner as possible.

Impact: Temporary increase in vicinity noise levels due to construction.

See discussion in Noise section of this report.

Mitigation

29. Follow Mitigation Measures #15 through #17.

Impact: Temporary localized degradation of air quality due to increased generation of dust.

See discussion in Air Quality section of this report.

30. Follow Mitigation Measure #19.

Impact: Temporary disruption of area businesses..

There are three non-residential uses in the project area: a nursery, a veterinary hospital, and a church. The church shouldn't be impacted as much as the other two uses because construction activities will not be occurring during times of typical church activities. However, temporary disruption to the other two businesses will occur as a result of loss of parking and restricted access. The approximate length of time during which the businesses may be affected will be 1 to 3 days during sidewalk reconstruction and 3 to 4 weeks during street reconstruction.

Mitigation

31. Schedule construction to be completed as soon as possible in front of area businesses.

Impact: Potential disruption of subsurface utilities.

Mitigation

32. Contact appropriate utilities to determine location and depth of underground lines, and plan construction so as to avoid these utilities.

Environmental Evaluations

Unavoidable Adverse Impacts

For the purposes of this section, unavoidable adverse impacts are those effects of the project which would affect either natural systems or other community resources. The degree of significance was determined by this consultant following completion of project evaluation. The following list includes only the identified significant, adverse impacts of the project.

Significant impacts that cannot be reduced to a level of insignificance include:

— Increase in vehicular noise.

Significant impacts of the project which cannot be alleviated or reduced in significance without a substantial change in project design include:

— Increase in vehicular noise.

Potentially significant impacts which can be minimized or eliminated if mitigations outlined in this report are followed include:

-- Loss of street trees and landscaping.
-- Change in neighborhood character.
— Temporary increase in construction-related noise.

It should be noted that the loss of street trees and change in neighborhood character will be an unavoidable aspect of the project. The implementation of recommended revegetation plans will result in a long-term mitigation (10 to 30 years) but will not provide any short-term mitigation.

Growth Inducement

EXISTING CONDITIONS

CEQA requires that any growth-inducing aspect of a project be discussed in an EIR. This discussion should include consideration of ways in which the project couuld direcly or indirectly foster economic or population growth in a surrounding area. Projects which could remove obstacles to population growth (such as a major public service expansion) must also be considered in this discussion. According to CEQA, it must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment.

Because the project does not provide any new access routes or opportunities it is not directly growth inducing. No new areas will be served by the improved section and no areas would be allowed to develop which are not already developed. The project is consistent with area plans and policies and will serve to enhance access patterns rather than create new ones. Although trips may be attracted to this route which do not currently occur, this is not growth inducing for a larger area.

Project Alternatives

This section evaluates alternatives to the proposed Ham Lane Improvement Project as required by CEQA. The discussion describes a number of alternatives (including the required "no project" alternative) which could feasibly attain the basic objectives of the project, as well as eliminate or reduce in significance those impacts identified in this report. Any additional impactr arising from the alternatives themselves are generally outlined and discussed.

The City of Lodi has identified several alternatives to the proposed project. These alternatives, identified below, represent the primary design options open to the City for alleviating congestion on Ham Lane. The consultant has not identified any options beyond those presented by the City, as our evaluation indicated that these options did, in fact, constitute the most feasible and realistic alternatives to the proposed project. Figures 9-1 and 9-2 show traffic projections and Piggures 10-12 illustrate alternative configurations. All figures are at the end of this section.

Alternative A: 72′ right-of-way (R/W) with 56′ developed width (primary construction and R/W acquisition on east side).

This alternative would result in the construction of a 56′ street within a 70′ R/W. The street would begin from the existing sidewalk on the west side of the street and extend ±56′ toward the east. Thus, the bulk of R/W acquisition and construction would occur on the east side of Ham Lane. This option also has two possible stripings or lane configurations: 1) four travel lanes with no on-street parking, or 2) two travel lanes, center turn lane and on-street parking.

Alternative B: 72′ right-of-way (R/W) with 56′ developed width (primary construction and R/W acquisition on west side).

This alternative and its lane options are exactly as those discussed above, except that the developed width would be measured from the existing sidewalk on the east side of the street and extend ±56′ toward the west. Except in the two blocks south of Oak on the east side where approximately seven feet of widening would be required. Thus the bulk of R/W acquisition and construction would occur on the west side of the street.

Alternative C: Improve roadway within existing curb and R/W (except between Lodi and Walnut).

This is essentially a "No Project" alternative. This alternative would result in widening of the west side between Lodi and Walnut only with reconstruction of the rest of the street within the existing curbs.

DISCUSSION

Table 9 presents the various LOS for the three traffic ranges for the year 2005.

Table 9
Projected Year 2005 Roadway Levels of Service

Roadway Cross-Section Alternative	Year 2005 Traffic Projections: Minimum Range Roadway LOS	Year 2005 Traffic Projections: Maximum Range Roadway LOS
LODI TO PINE		
Alternative A & B 56' 3-Lane Section	A	C
Alternative A & B 56' 4-Lane Section*	A	A
Alternative C Existing Section	A	D
Proposed Project 64' 4-Lane Section	A	A
PINE TO ELM		
Alternative A & B 56' 3-Lane Section	A	B
Alternative A & B 56' 4-Lane Section*	A	A
Alternative C Existing Section	B	C
Proposed Project 64' 4-Lane Section	A	A

All four cross section/lane configurations options can accommodate the projected traffic volumes at a LOS B through the year 2005. However, if maximum traffic growth occurs the Alternative C and Alternatives A and B (with the two travel lanes, one center lane and parking lane configuration) will experience reduced LOS by the year 2005.

* No parking.

Implementation of Alternative B, with primary R/W acquisition and street development on the west side would result in the retention of a significant number of street trees when compared to the proposed project and Alternative A.

Thus, the following statements can be made about the implementation of the various alternatives:

Implementation of Alternative A would:

-- Primarily impact the residents along the east side of Ham Lane.
-- Result in the loss of ±20 mature street trees.
-- Provide LOS B to the year 2005 if striped for four lanes/no parking and LOS C to B if striped for two travel lanes, one center turn lane and on-street parking.
-- Minimize disruption of the entire 4-block long corridor.

Implementation of Alternative B would:

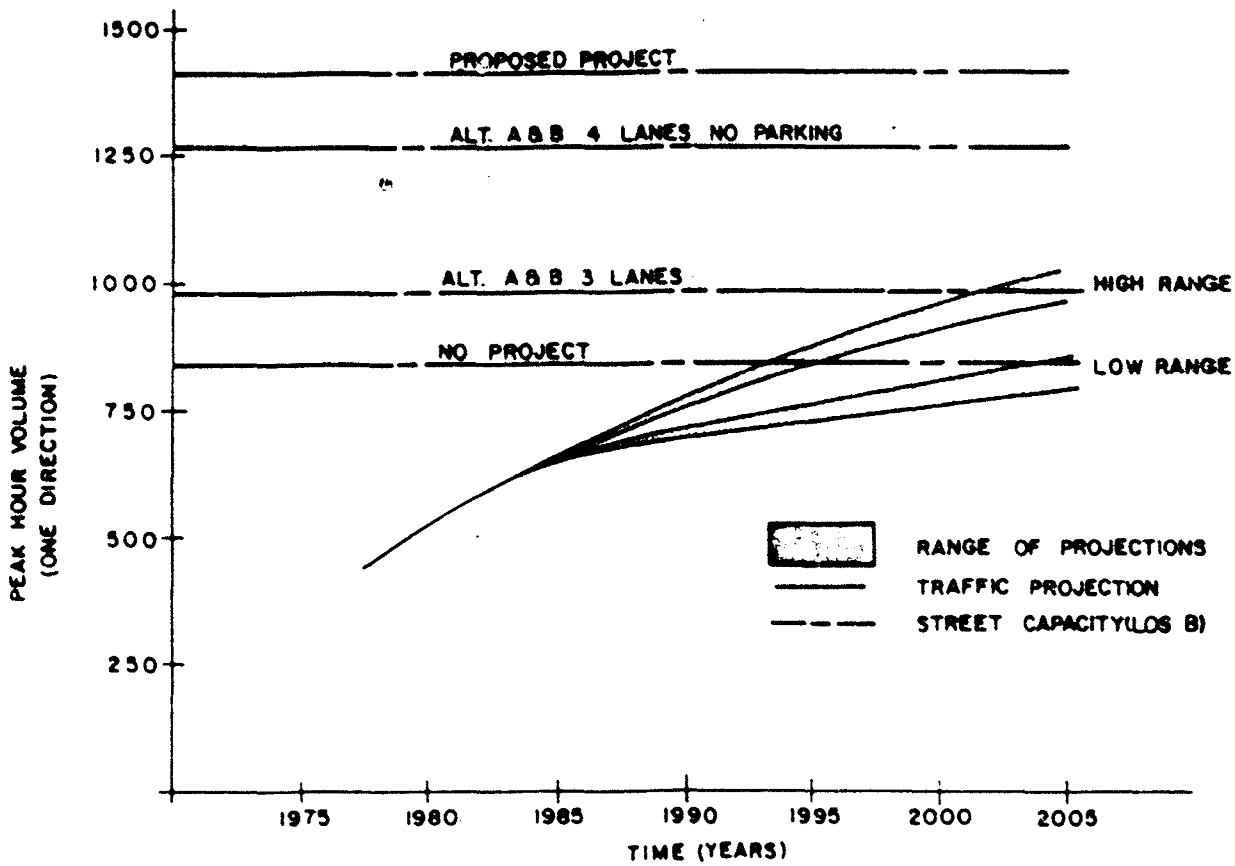
-- Primarily impact the residents along the west side of Ham Lane.
-- Result in the loss of ±8 mature street trees.
-- Provide LOS B to the year 2005 if striped for four lanes/no parking and year 2005 LOS C to B if striped for two travel lanes, one center turn lane and on-street parking.
-- Minimize disruption of the entire 4-block long corridor.

Implementation of Alternative C would:

-- Provide low LOS (D) by the year 2005.
-- Primarily impact the residents between Lodi and Pine.
-- Result in the loss of 6 mature street trees.
-- Result in the improvement of the Lodi/Ham Lane intersection.
-- Minimize disruption of the entire 4-block long corridor.

ENVIRONMENTALLY SUPERIOR PROJECT

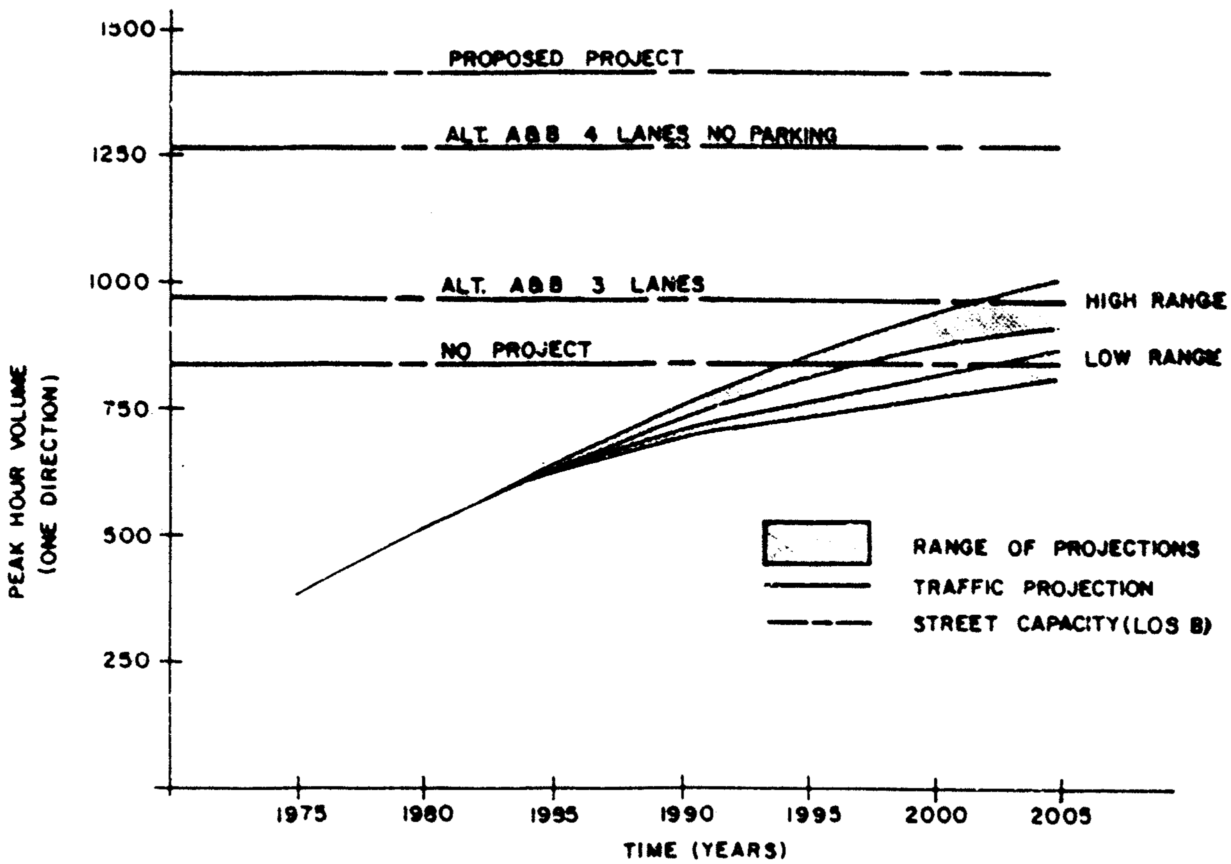
The environmentally superior project for the Ham Lane Improvement Project appears to be Alternative B with the two travel lanes, one center turn lane and on-street parking stiping option. However, this statement is made with the knowledge that selection of this project would result in the potential for the city to have to accept a lower LOS on the street by the year 2005, restripe the street to preclude on-street parking near that year, or rebuild a larger project at that time. So, although Alternative B is clearly environmentally superior in that fewer trees are affected, fewer residents are directly impacted and the character of the street is retained, this option could raise potential conflicts with adopted City policy concerning levels of service and expense of reconstruction again at some future date. Therefore, the environmental facts will need to be weighed against the practical and policy issues.



Traffic Projections and Street Capacities

Lodi to Pine

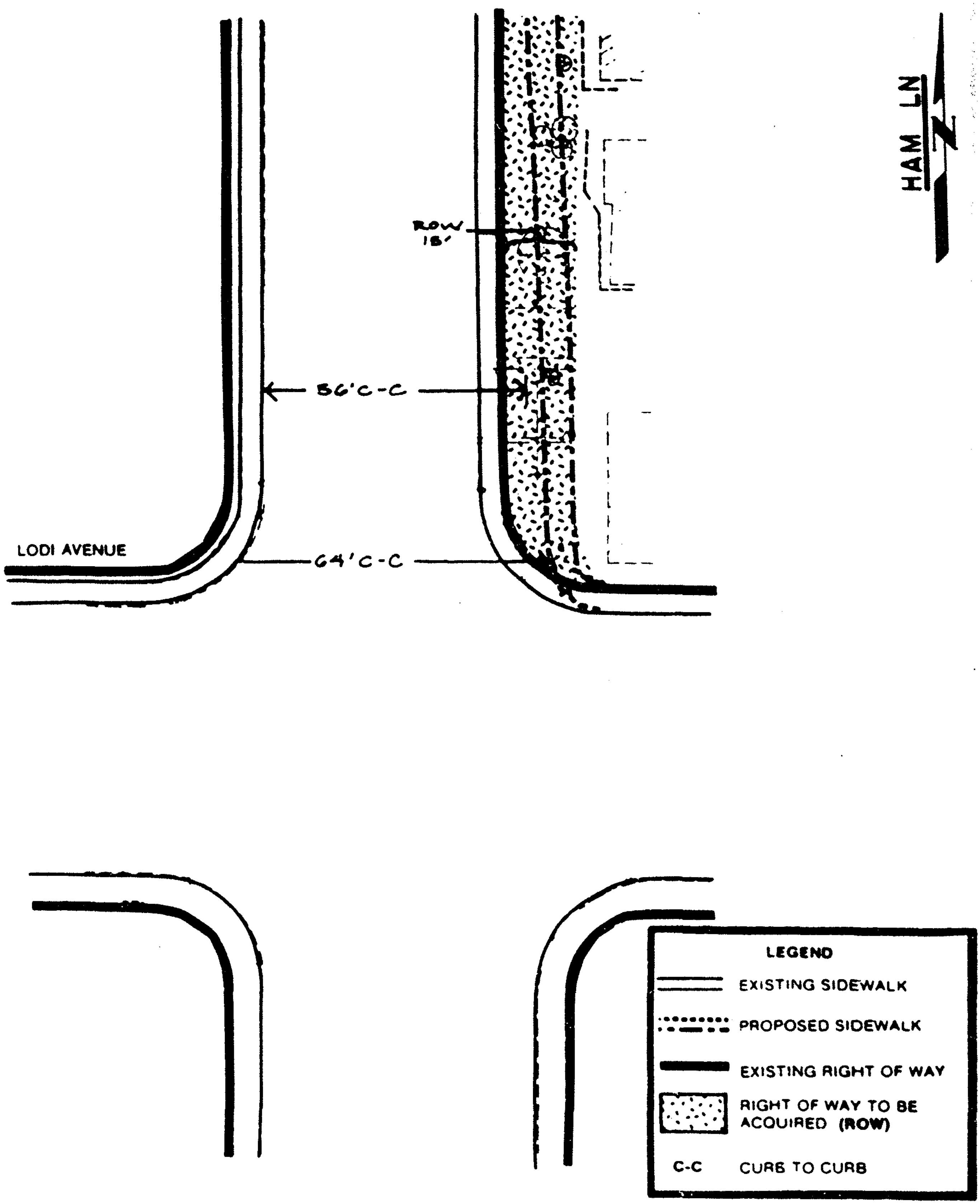
Figure 9-1



Traffic Projects and Street Capacities

Pine to Elm

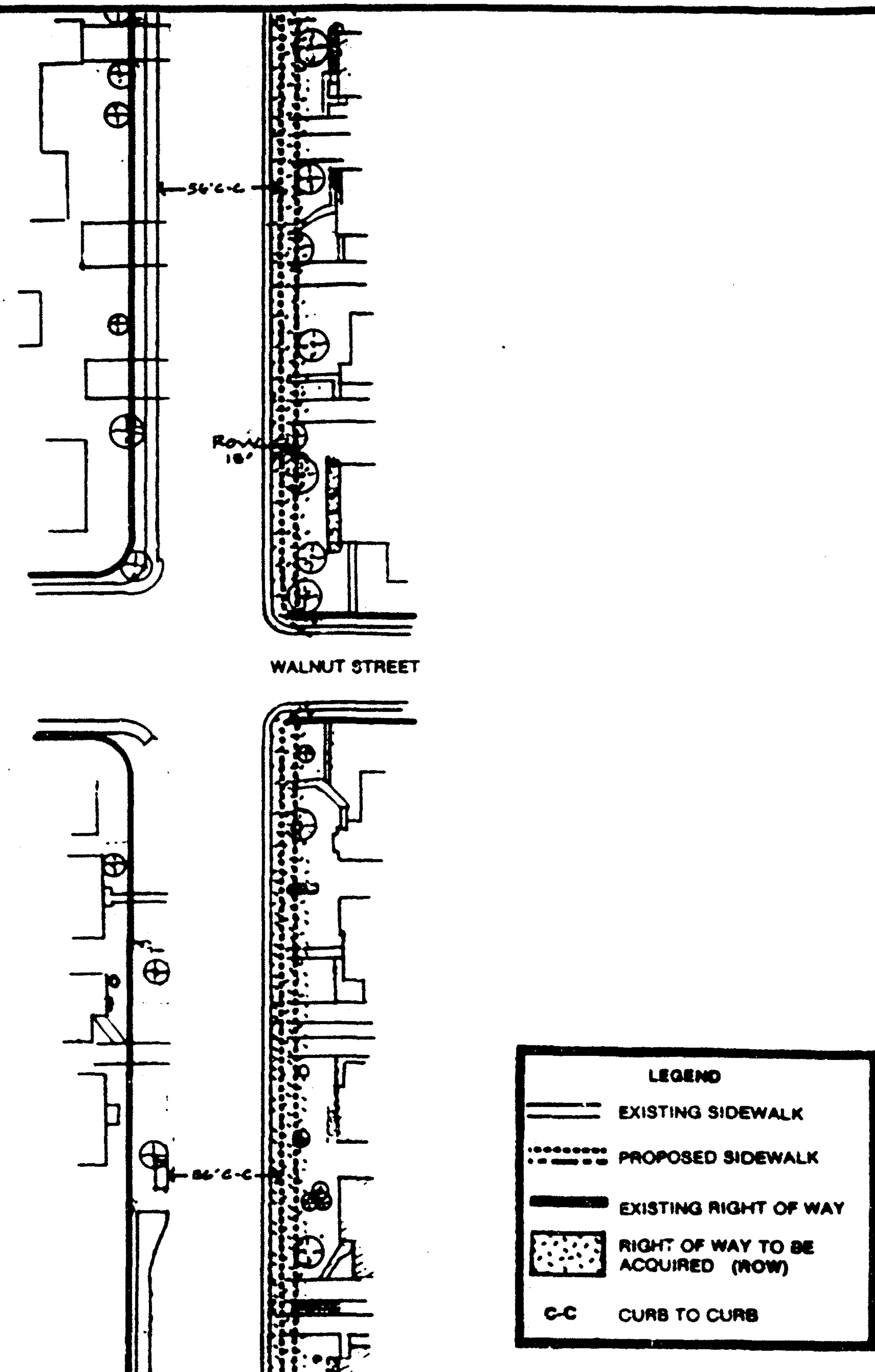
Figure 9-2



Ham Lane Project Alternative A

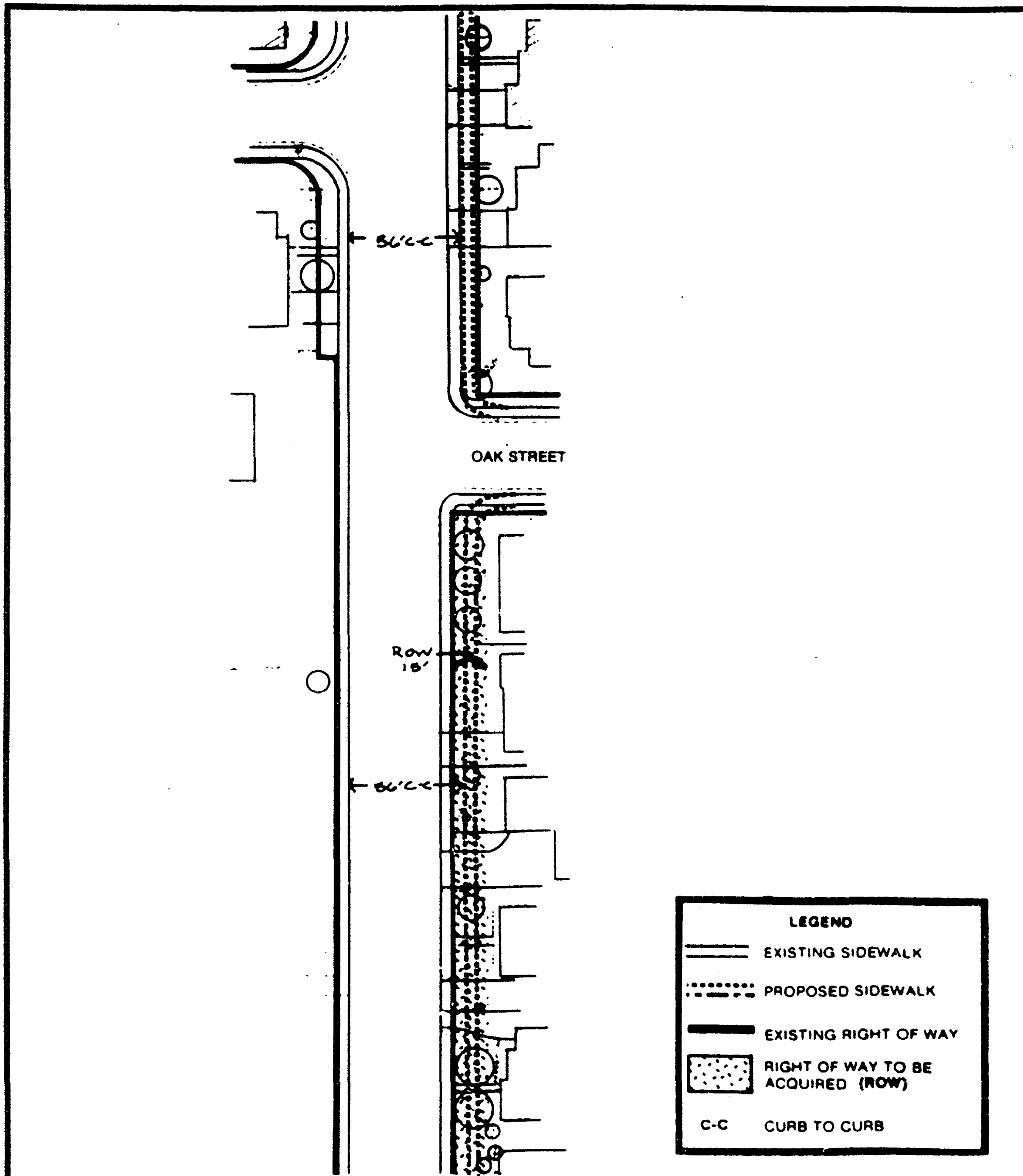
Primary Impact East Side

Figure 10-1



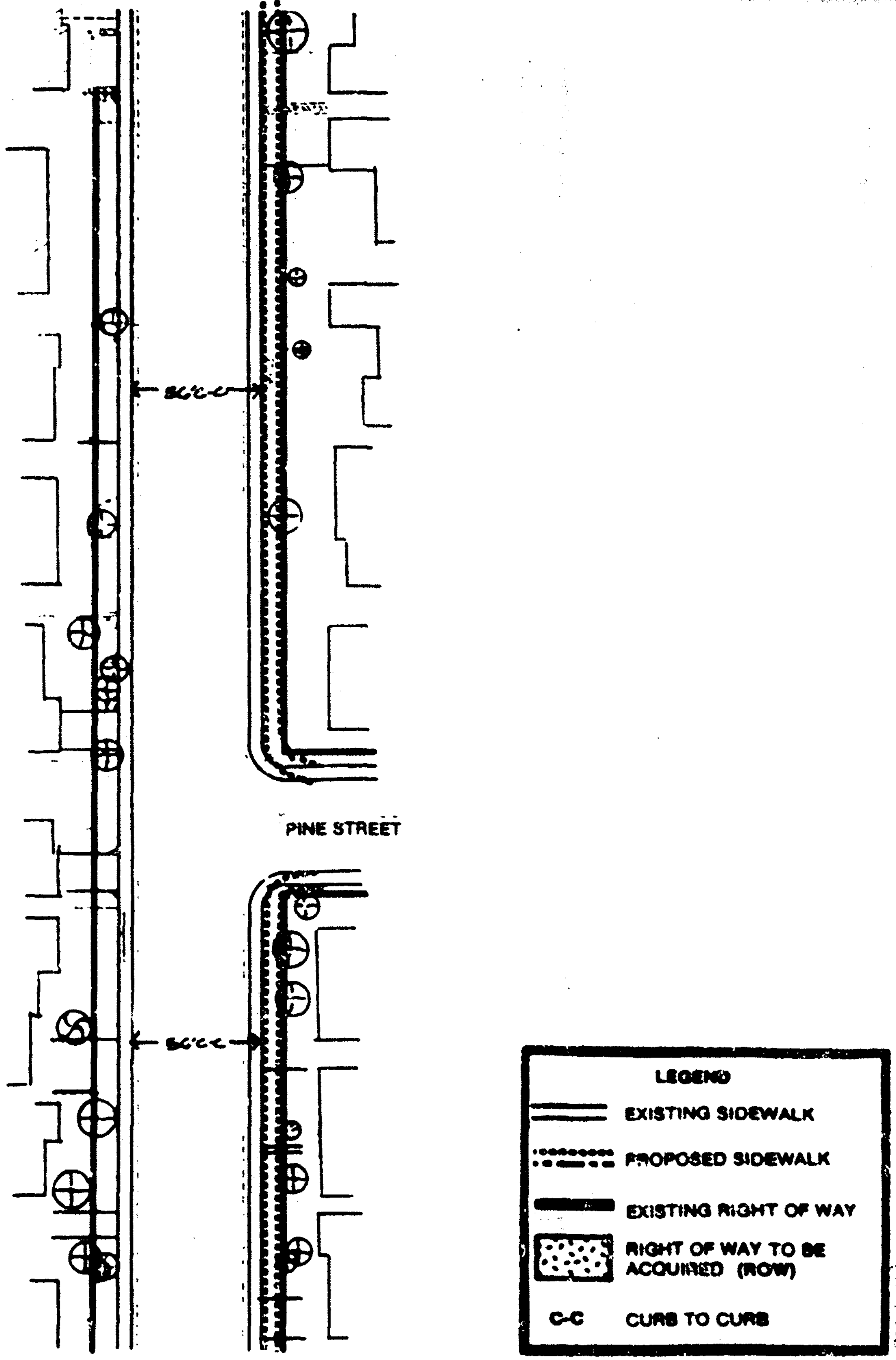
Ham Lane Project Alternative A

Figure 10-2



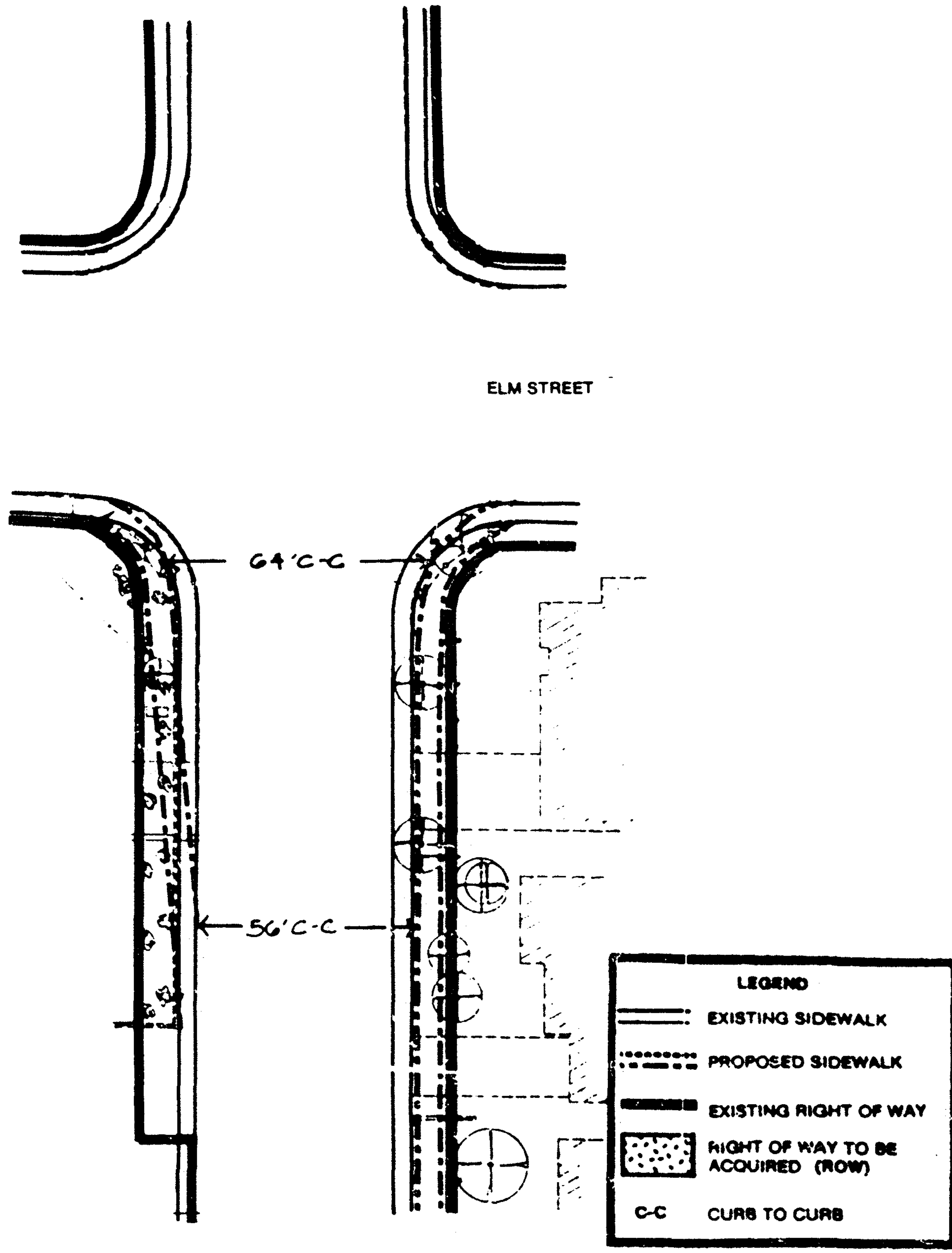
Ham Lane Project Alternative A

Figure 10-3



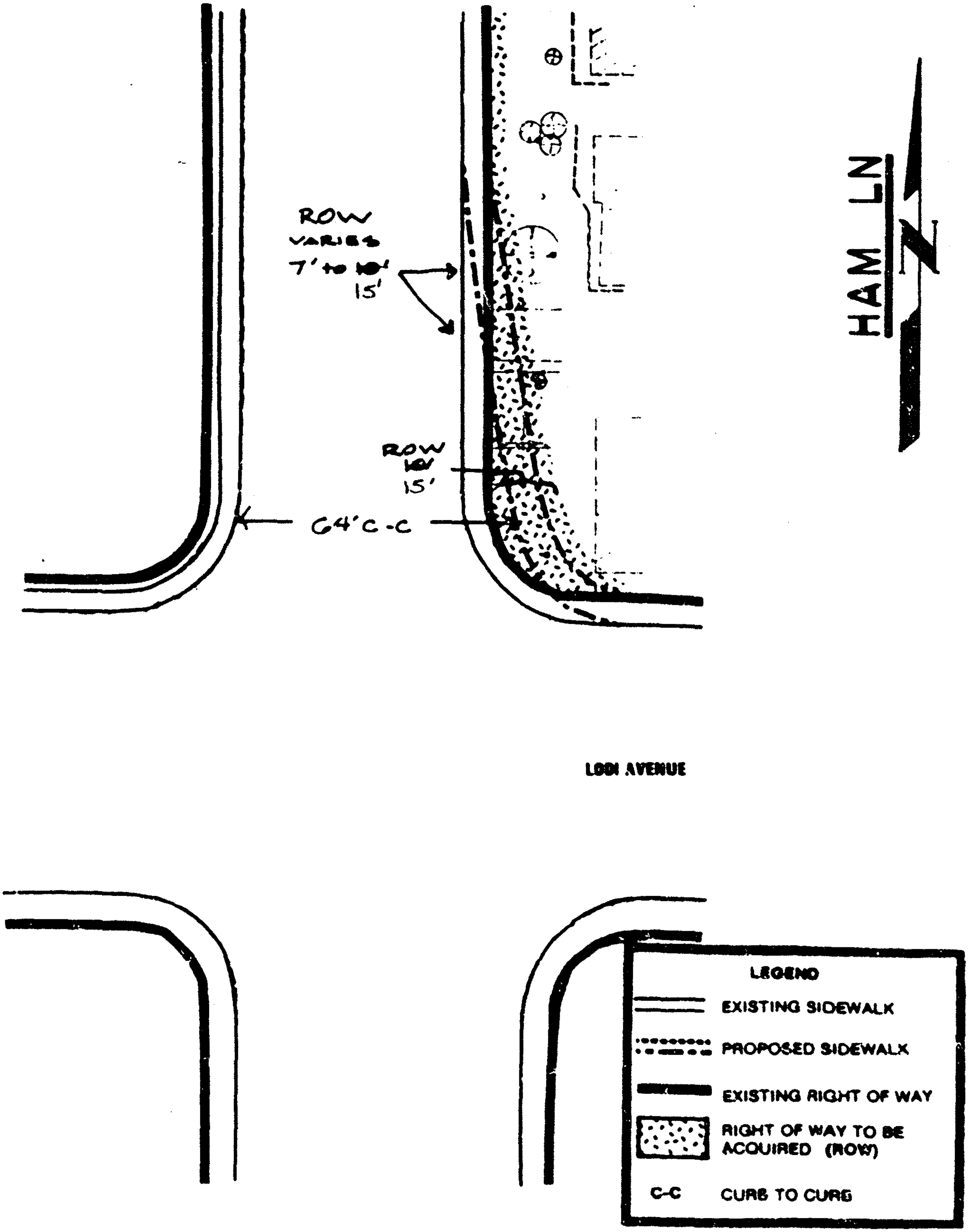
Ham Lane Project Alternative A

Figure 10-4



Ham Lane Project Alternative A

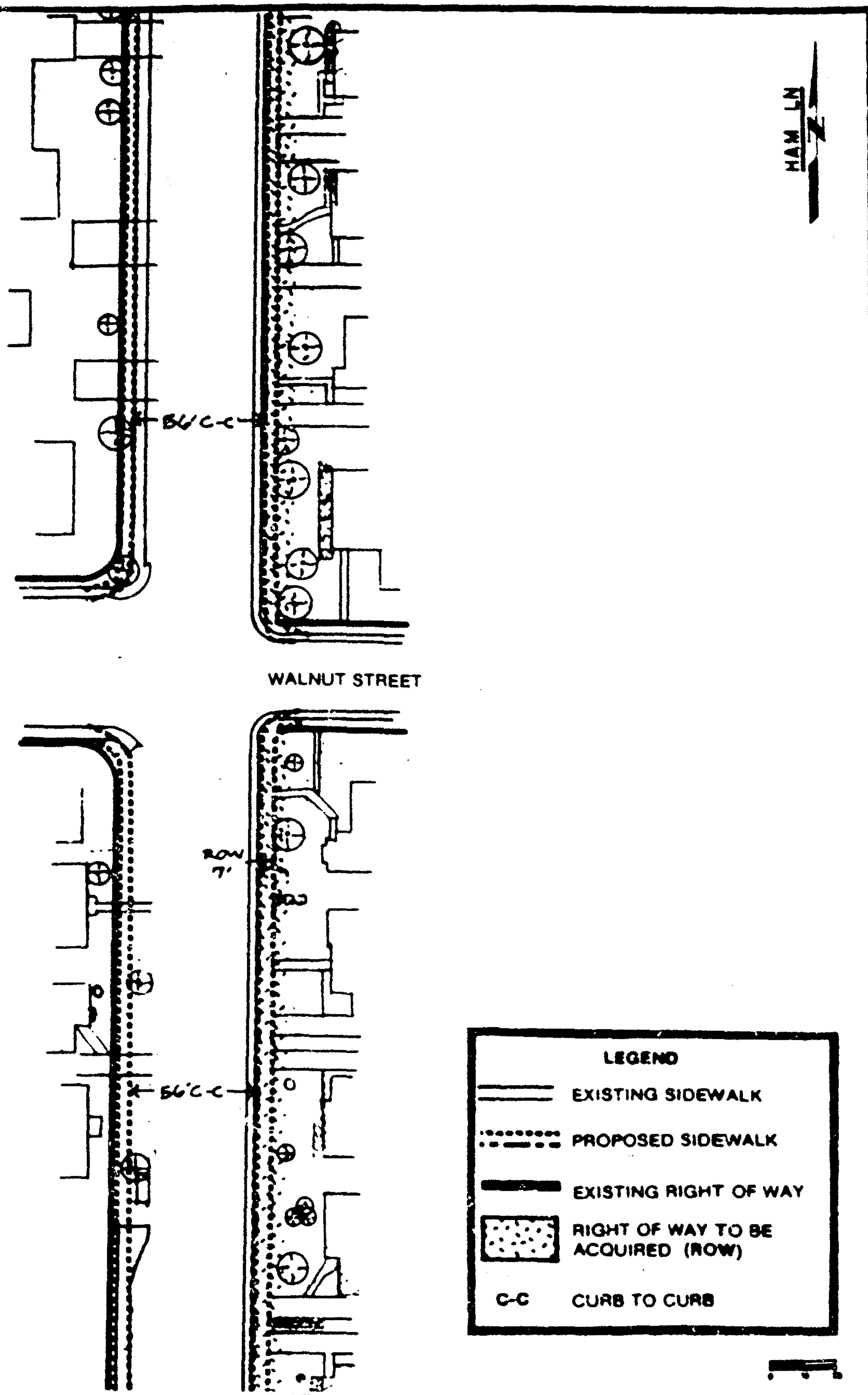
Figure 10-5



Ham Lane Project Alternative B

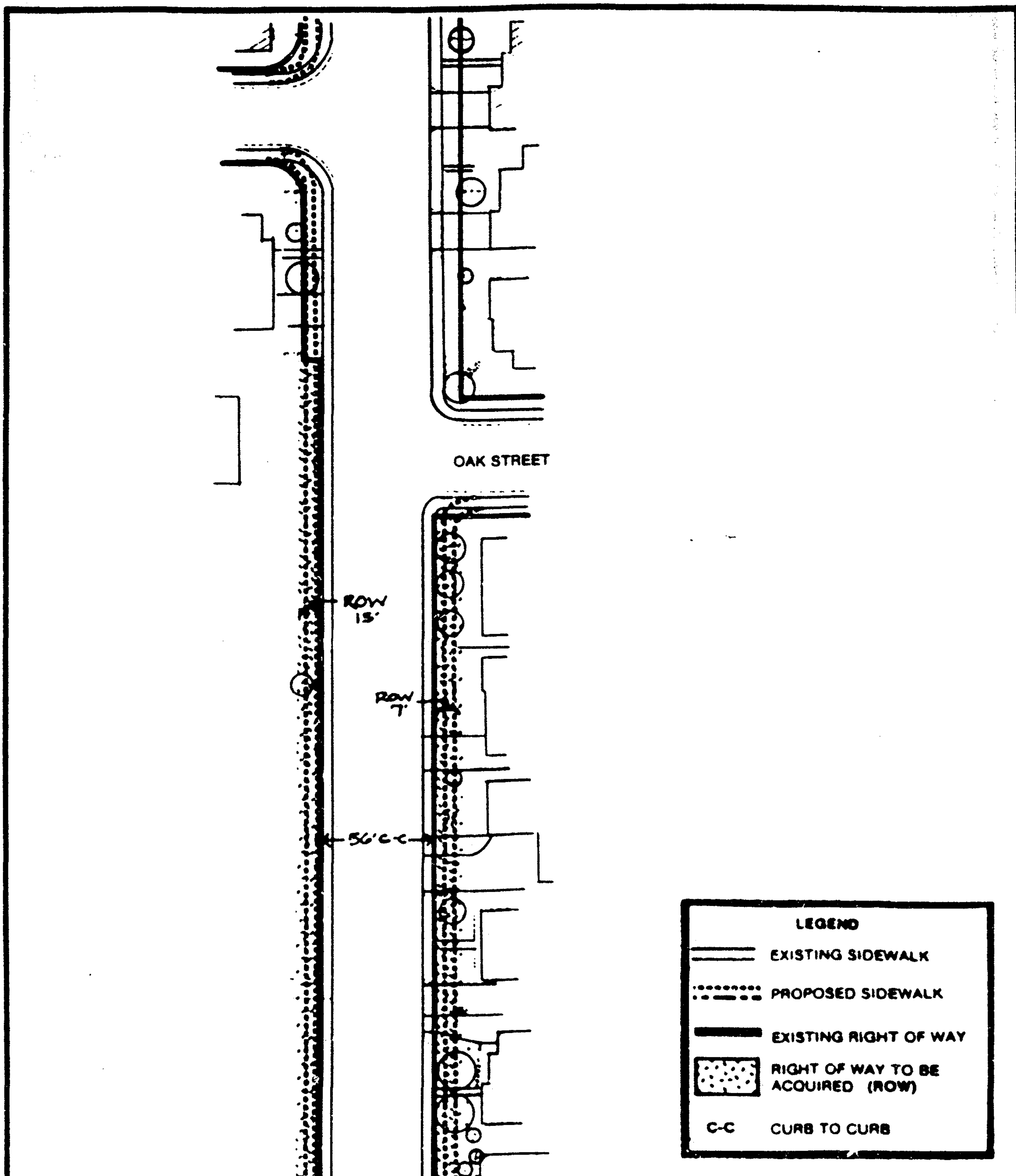
Primary Impact West Side

Figure 11-1



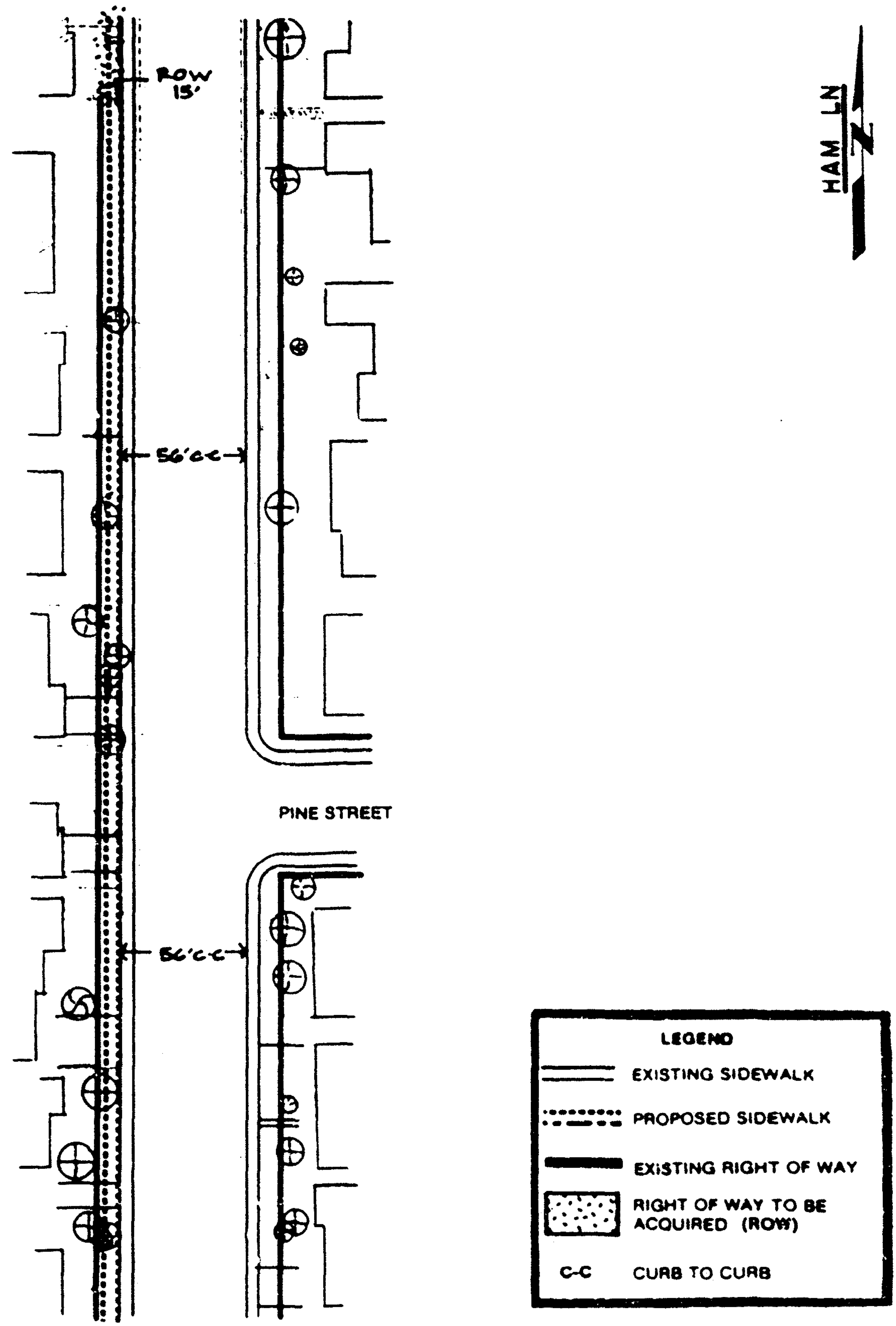
Ham Lane Project Alternative B

Figure 11-2



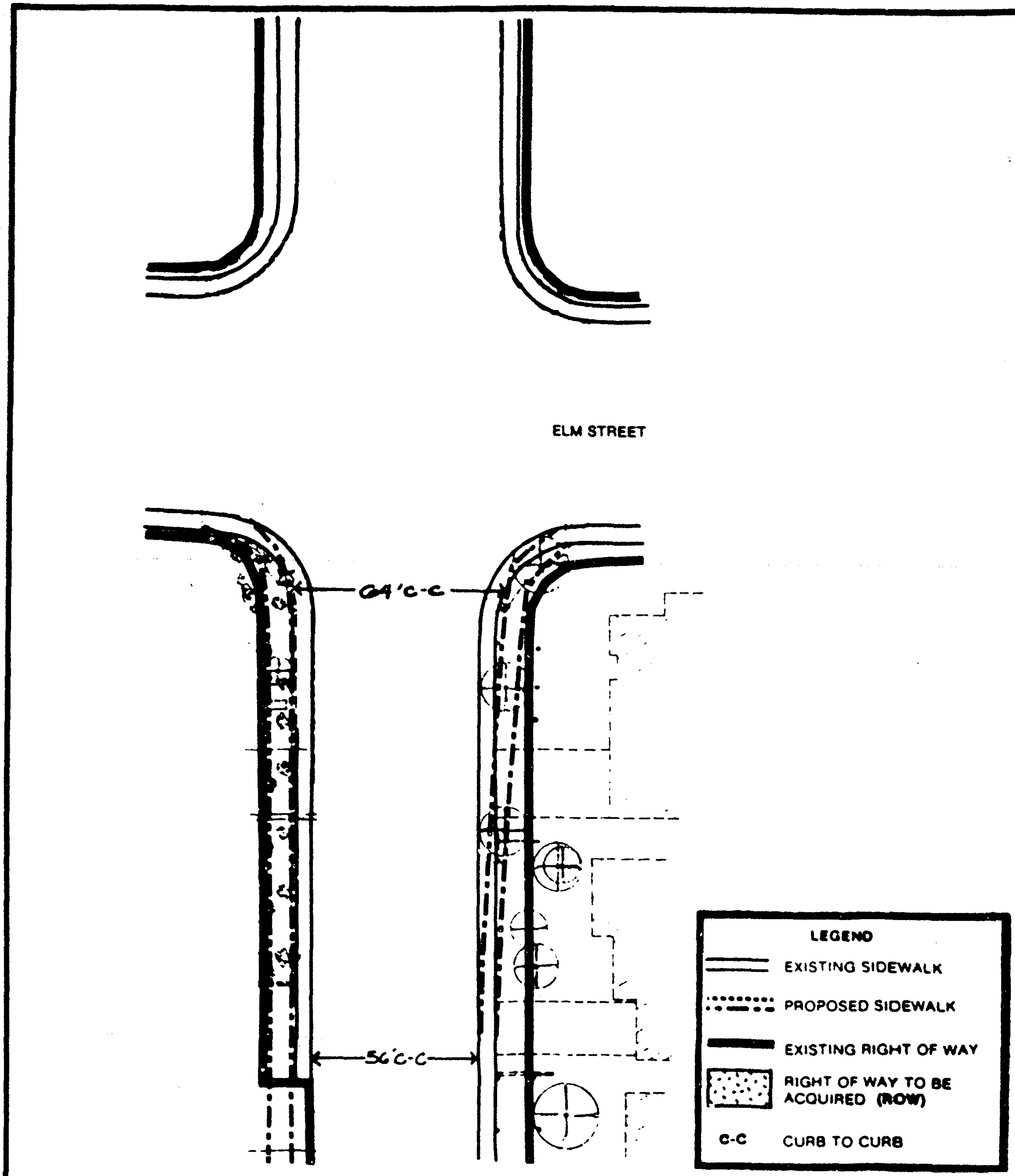
Ham Lane Project Alternative B

Figure 11-3



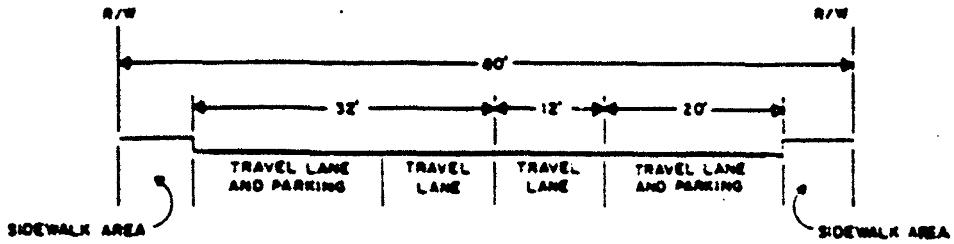
Ham Lane Project Alternative B

Figure 11-4

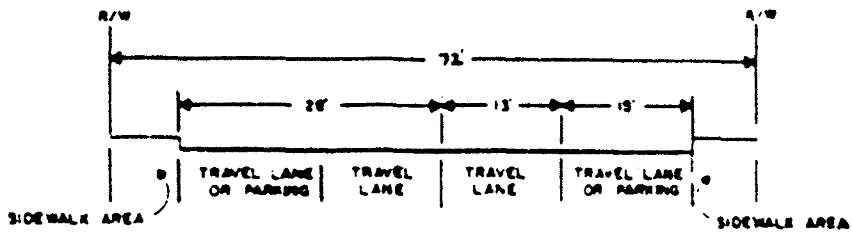


Ham Lane Project Alternative B

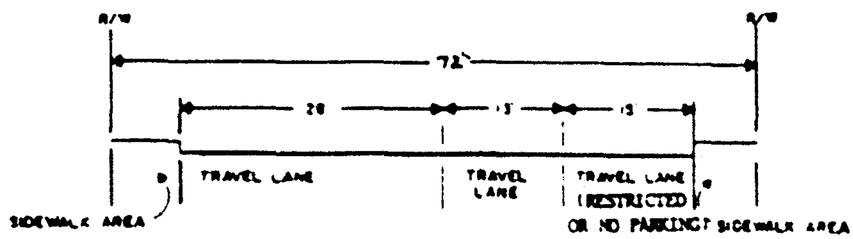
Figure 11-5



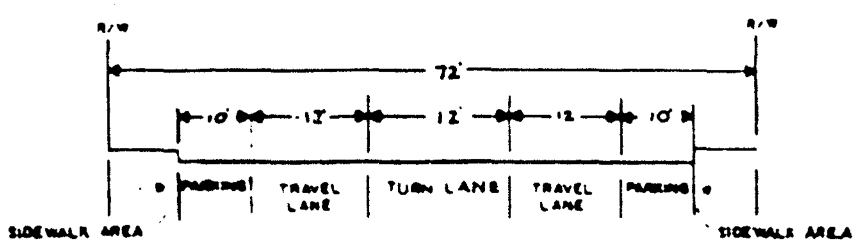
PROPOSED PROJECT — 64' STREET, 80' RIGHT-OF-WAY



ALTERNATIVE A & B - 56' STREET, 70' RIGHT-OF-WAY



ALTERNATIVES A & B - 4 TRAVEL LANES, NO PARKING



ALTERNATIVES A & B — 2 TRAVEL LANES, CENTER TURN LANE, PARKING OPTION

ALTERNATIVE STRIPING OPTIONS

Alternative Street Cross Sections

Figure 12

Report Authors, Persons Contacted, and References

REPORT PREPARATION

Kate Burdick, Principal and Project Manager
Stephanie Strelow, Environmental Planner
Kathleen Mrcheck, Graphics
Judy Cornell, A Way With Words, Word Processing

Subcontractors

Jeff Clark, Traffic
Suzanne Olive, Plants
Stan Shelley, Noise and Air Quality

PERSONS CONTACTED

David Morimoto, City of Lodi Planning Department
Richard Prima, City of Lodi Public Works Department
Jack Ronsko, City of Lodi Public Works Director

Area Residents:

- Pat Williams
- Oliver Nola
- Harold Hoover
- June K. Hoover
- Theophil Mehlhoff
- Elisabeth Mehlhoff
- Lorine L. Baker
- Frederick D. Schmidt
- Ruth K. Schmidt
- Marin A. Schmidt
- Raynette Fergason
- Larry Fergason
- Bill Eutsler
- Roada Kempf
- Pattie Cox
- Jim Cox
- Geme Boscacci
- Lois Borchaudt
- Andy Anderson
- Nancy Anderson
- Willard Takahashi
- Muriel Hoggatt
- Evelyn Comartin
- W. J. Comartin, Jr.
- Argirios Adam
- Lenora Eutsler
- Gertrude A. Duff
- Cindy Gentne

Elsie Sokol
Twai Sokol
T. Sweat
Marvis Sweat

REFERENCES

California Resources Agency. State CEQA Guidelines.

CH2M Hill, Ham Lane Improvement Project, Lodi Avenue to Elm Street: Final Environmental Impact Report, City of Lodi, May 1978.

CH2M Hill, Hutchins Street Improvement Project, Draft Environmental Impact Report, City of Lodi, October 1981.

CH2M Hill, Hutchins Street Improvement Project, Environmental Impact Report, City of Lodi, February 1982.

Shelley, H. Stanton, "Air Quality Impact and Mitigation Study, Ham Lane Improvement Project." Environmental Consulting Services. August 1984.

Shelley, H. Stanton, "Noise Ipmact and Mitigation Study, Ham Lane Improvement Project." Environmental Consulting Services. Auguust 1984.

Appendices

Appendix A

Plants Inventory

by

Suzanne Clive

LIST 1:

The following plant species will be removed should Ham Lane be widened to utilize the eighty foot right-of-way:

On the east side between Elm Street and Pine Street:

- 3 mature Fraxinus velutina 'Modesto', Modesto Ash
- a few Rosa sp., Roses

between Pine Street and Oak Street:

- 1 mature Acer saccharinum, Silver Maple
- 1 Citrus sp.

between Oak Street and Walnut Street:

- 3 mature Silver Maples
- 1 immature Liquidambar styraciflua, American Sweet Gum
- 4 immature Betula verrucosa, White Birch
- 1 mature Cedrus deodara, Deodar Cedar
- 2 mature Calocedrus decurrens, Incense Cedar
- shrub Juniperus sp., Juniper
- 2 mature Picea pungens, Colorado Blue Spruce
- 1 mature Picea sp., Spruce
- 1 Fruit Tree
- 3 Modesto Ash

between Walnut Street and Lodi Avenue:

- 1 immature Morus alba, Fruitless Mulberry
- 1 immature Colorado Blue Spruce
- 1 mature Colorado Blue Spruce
- 1 Lagerstroemia indica, Crape Myrtle
- a few shrubs, including Roses, Junipers, and Euonymus
- 1 mature Acer negundo, Box Elder
- 4 mature Modesto Ash
- 2 immature White Birch
- 2 Fruit Trees

On the west side between Elm Street and Oak Street:

- numerous shrubs: Junipers; Ilex sp., Holly; Crape Myrtles; and Grevillea sp. (landscaping bordering nursery) also Junipers, Cotoneaster sp., Cercis sp.
- 1 mature Pinus sp., Pine
- 1 immature Pine
- 2 mature Modesto Ash
- 2 Cupressus sempervirens, Italian Cypress
- 1 mature Colorado Blue Spruce

between Oak Street and Walnut Street:

- 2 Euonymus sp.
- 1 mature Colorado Blue Spruce
- 1 mature Modesto Ash

between Walnut Street and Lodi Avenue:

- 2 mature Modesto Ash
- a few shrubs

August 30, 1984

Kate Burdick
Planning and Land-use Consultant
1545 Shirland Tract
Auburn, California 95603

Dear Ms. Burdick:

Presented below are the probable impacts on the vegetation should Ham Lane be widened to utilize the eighty foot right-of-way.

Approximately twenty-two mature trees will be removed on the east side of Ham Lane. On the west side approximately ten mature trees will be removed. (See attached List 1.) Removal of said trees will result in a loss of shade and an increase in temperature. Further, the locale will be more exposed and drier.

Approximately twenty immature trees and various shrubs will be removed on the east side of Ham Lane. On the west side approximately thirty-two immature trees and shrubs will be removed. The majority of these comprise the landscaping adjacent to the nursery. Removal of these young trees and shrubs will have a visual impact, especially where Ham Lane borders the nursery.

In addition, the widening of Ham Lane will claim approximately ten feet of lawn and landscaping from the dwellings along the roadway. Besides obvious visual impacts, lost lawn area will result in less privacy and increased traffic noise and dust.

Possible mitigation of the impacts discussed above would require replanting Ham Lane with boxed trees of the same or similar species. The Raywood Ash or the Moraine Ash should be substituted for the Modesto Ash. These species are more disease resistant. (See attached List 2.) However, only partial mitigation could be expected because the space available for root growth is suitable in most areas for only small trees. Large trees should be planted a minimum of fifteen to twenty feet away from a dwelling. Medium trees should be planted a minimum of ten to fifteen feet away from a dwelling. Where mature trees stand on or just within the limit of the right-of-way, the width of the sidewalk should be adjusted to accommodate the base of the tree. Approximately fifteen trees would be saved. Trees should be trimmed to allow for a vertical height clearance of ten feet over the sidewalk and curb.

Immature trees and shrubs within the right-of-way could be dug out and replanted on the impacted site if space allows. Additional shrubs could be planted as a hedge or screen to mitigate impacts on appearance, privacy, and noise. (See attached List 3.) Privacy could be further enhanced through the use of four foot fencing or lattice.

Given the age and canopy of the trees to be removed and considering the size of the remaining lawn areas, the full impacts of widening Ham Lane to utilize the eighty foot right-of-way can not be mitigated.

Sincerely,

Suzanne P. Olive
Botanist

LIST 2 (cont.)

Scientific name / Common name	Evergreen/ Deciduous	Height to: / Width to:	Comments
MEDIUM TREES (cont.)			
Celtis sinensis Chinese Hackberry	D	40 feet	Bark often covered with projecting growth, deep rooted, won't heave sidewalk, good in windy places, plant from containers
Ceratonia siliqua Carob Tree	E	30-40 feet 30-40 feet	Large shrub or tree, moderate growth rate, needs more than normal space, roots will break sidewalk, give infrequent, deep watering
Fraxinus holotricha 'Moraine' Moraine Ash	D	40 feet	Fairly fast growing, good lawn tree, casts light, filtered shade, disease resistant
Fraxinus oxycarpa 'Raywood' Raywood Ash	D	35 feet	Fast growing, disease and pest resistant
Pinus halepensis Aleppo Pine	E	30-60 feet	Moderate to rapid growth, thrives in heat and wind, open irregular crown at maturity
Pistacia chinensis Chinese Pistache	D	35-60 feet	Leaves brilliant red in fall, moderate growth, not particular about soil or water, spreading rounded crown
Tilia cordata Little-leaf Linden	D	30-50 feet 15-30 feet	Excellent lawn or street tree, hardiest linden, form is densely pyramidal
LARGE TREES (from 50 to 70 feet in height)			
Calocedrus decurrens Incense Cedar	E	75-90 feet	Symetrical, slow growing initially, deep, infrequent watering
Cinnamomum camphora Camphor Tree	E	50 feet or more	Slow growing, beautiful in any season
Ginkgo biloba 'Saratoga' Maidenhair Tree	D	50 feet or more	Slow growing, plant only male trees, disease and pest free, yellow fall color, attractive any season

LIST 2: Proposed Residential Street Tree Planting List

Scientific name / Common name	Evergreen/ Deciduous	Height to: / Width to:	Comments
SMALL TREES (to 35 feet in height)			
Acer buergerianum Trident Maple	D	20-25 feet	Low spreading growth, Outstanding fall color
Geijera parviflora Australian Willow	E	25-30 feet 20 feet	Moderate growth rate, small, graceful, deep rooted, needs water, full sun
Ilex altaclarensis 'Wilsonii' Wilson Holly	E	15-20 feet	Tolerates sun, wind, shade and any soil, bright red berries
Koelreuteria paniculata Goldenrain Tree	D	20-35 feet 10-40 feet	Slow to moderate growth, valuable in difficult soil, tolerates heat, wind and drought
Lagerstroemia indica Crape Myrtle	D	6-30 feet	Showy flowers in summer, slow growing, full sun
Laurus nobilis Sweetbay	E	12-40 feet	Tree or shrub, slow growing, bayleaf in cooking, needs good drainage, light shade
Magnolia soulangiana Saucer Magnolia	D	25 feet 25 feet	Blooms in spring before leaves expand, white to purplish red, does poorly in hot, windy areas
Maytenus boaria Mayten Tree	E	30-40 feet	Graceful, pendulous branches, slow growing, roots not invasive, choice lawn tree
Prunus blireiana Purpleleaf Plum	D	25 feet 20 feet	Leaves reddish purple, flowers semidouble, pink, fragrant, Feb.-April, no fruit
Pyrus kawakamii Evergreen Pear	E	small tree	Fast growing, white flowers in spring, partially deciduous
MEDIUM TREES (from 35 to 50 feet in height)			
Alnus cordata Italian Alder	D	40 feet 25 feet	Moisture loving, rapid growth, roots are invasive, interesting catkin display before leaves

LIST 3: Proposed Shrubs to Serve as a Hedge or as Screening

Scientific name / Common name	Evergreen/ Deciduous	Height to: Width to:	Comments
Acacia decora / Graceful wattle	E	6-8 feet / 6-8 feet	Can be trimmed to 5 feet, drought resistant
Camellia japonica	E	6-12 feet / 6-12 feet	Many named varieties, requires good drainage and moist soil, slow growing
Chaenomeles / Flowering Quince	D	6-10 feet / 6-10 feet	Flowers appear in Jan. before the leaves, easy to grow
Choisya ternata / Mexican Orange	E	6-8 feet / 6-8 feet	Rapid growth, fragrant white flowers in early spring, informal hedge, needs fast drainage and light shade
Cocculus laurifolius	E	25 feet	Multistemmed shrub or small tree, slow growing, can be kept low by pruning, sun or shade
Coprosma repens / Mirror Plant	E	10 feet / 6 feet	Rapid growth, prune to achieve desired height and density, needs partial shade and able water
Cotoneaster spp.	E or D	varies w/ species	Informal hedge, prune to enhance arching habit, don't plant near sidewalk
Coleonema spp. or *Diosma* / Breath of Heaven	E	5-10 feet / 5-10 feet	Fragrant when brushed or bruised, flowers pink or white, light soil, wispy, shear lightly, full sun
Euonymus spp.	E or D	varies w/ species	Valued for foliage, form, and texture
Elaeagnus spp.	E or D	varies w/ species	Large shrubs or trees, fast growing, dense, full, tolerates heat and wind
Garrya spp. / Silktassel	E	4-8 feet / 4-8 feet	Full sun, interesting flower tassels Dec.-Feb., tolerates heat and drought

LIST 2 (cont.)

Scientific name / Common name	Evergreen/ Deciduous	Height to: Width to:	Comments
LARGE TREES (cont.)			
Liquidambar styraciflua / American Sweet Gum	D	60 feet	Moderate growth rate, good all-year tree, good fall color, can be pruned
Liriodendron tulipifera / Tulip Tree	D	60-80 feet / 40 feet	Fast growth, leaves turn yellow in fall, needs plenty of summer water and room, handsome
Magnolia grandiflora	E	60-80 feet / 40 feet	Dark glossy leaves, white, fragrant blossoms in summer and fall
Quercus ilex / Holly Oak	E	40-70 feet / 40-70 feet	Moderate growth rate, relatively pest and disease free
Quercus suber / Cork Oak	E	70-100 feet / 70-100 feet	Moderate growth rate, trunk and principal limbs covered with thick, corky bark which carves easily

LIST 3 (cont.)

Scientific name Common name	Evergreen/ Deciduous	Height to: Width to:	Comments
<u>Ilex cornuta</u> Chinese Holly	E	10 feet 10 feet	Shrub, small tree, large long-lasting red berries
<u>Ilex crenata</u> Japanese Holly	E	3-4 feet 3-4 feet	Shrub, sun or shade, black berries, dense, erect
<u>Juniperus</u> spp. Junipers	E	6-20 feet	Shrubs, foliage needle-like or scalelike or both, many uses
<u>Ligustrum japonicum</u> Japanese Privet	E	10-12 feet	Shrubs or small trees, excellent hedges or screens
<u>Mahonia aquifolium</u> Oregon Grape (The scientific name has been changed to <u>Berberis aquifolium</u> and the species may be sold under either name)	E	6 feet	Tall, erect habit, any exposure, blue-black berries in March-May, edible, control height by pruning, spiny-toothed leaves
<u>Pieris japonica</u> Lily-of-the-Valley Shrub	E	9-10 feet	Upright, dense, tiered growth, partial shade, needs generous watering, flowers in drooping clusters, pink or white
<u>Pittosporum</u> spp.	E	6-25 feet varies w/ species	Good form and foliage, some species have fragrant flowers, sun or shade
<u>Psidium cattleianum</u> Strawberry Guava	E	8-10 feet	Moderate growth, beautiful bark, dark red fruit, good informal hedge
<u>Viburnum</u> spp.	D or E	4-20 feet varies w/ species	Sun or shade, often fragrant flowers, prune to prevent legginess, plant E in partial shade

Appendix B

Traffic Report

HAM LANE IMPROVEMENT PROJECT
TRAFFIC ANALYSIS

by Jeff Clark

INTRODUCTION

This report summarizes present conditions and future traffic impacts to Ham Lane between Elm Street and Lodi Avenue in the City of Lodi. Three alternative improvement plans were evaluated. The analysis included the evaluation of existing and future land uses, traffic volumes, street cross-sections, channelization, and traffic control devices. Alternative improvement plans for Ham Lane were developed and analyzed using future peak-hour traffic projections, street capacities, physical constraints and parking demands.

EXISTING CONDITIONS

Ham Lane is one of the major north-south streets in Lodi. It terminates at Turner Road on its north end and at Harney Lane on the south end. The segment of Ham Lane analyzed in this study is from Elm Street to Lodi Avenue. It is four blocks long, and its location in Lodi is shown on Exhibit 1.

Land Uses

Current land uses along Ham Lane between Elm Street and Lodi Avenue vary from low to high density residential with some commercial near Elm Street.

Right-of-Way

The current right-of-way (R/W) for Ham Lane between Elm Street and Lodi Avenue is mostly 60 feet wide with a section of 80-foot ROW at Lodi Avenue. The existing street is mostly 44' to 48' wide and is not centered in the right-of-way.

Striping

This section of Ham Lane is currently striped with two travel lanes. Crosswalks are marked at intersections.

Control Devices

An eight phase traffic signal controls the Lodi Avenue and Ham Lane intersection and a four phase traffic signal controls the Elm Street and Ham Lane intersection.

Parking

Curbside parallel parking is allowed on street along both sides of Ham Lane from Lodi to Elm. The current onstreet parking capacity is approximately 135 spaces.

Traffic Volumes

The current traffic volume for this segment of Ham Lane ranges from 12,400 to 14,100 vehicles per day. Average daily traffic (ADT) volumes were calculated from counts taken by the City of Lodi on May 15th, 16th, and 17th which are a Tuesday, Wednesday and Thursday. These days were chosen because they represent the most "normal" traffic behavior and will present the best traffic volumes for an <u>average day</u> in Lodi. The peak hour traffic volumes were also calculated in the same manner. Existing peak hour traffic counts/traffic flows occur during the normal peak hours of (7:00 to 9:00 am and 4:00 to 6:00 pm). However, there is a secondary peak hour in the afternoon at the times that Lodi High School gets out

4

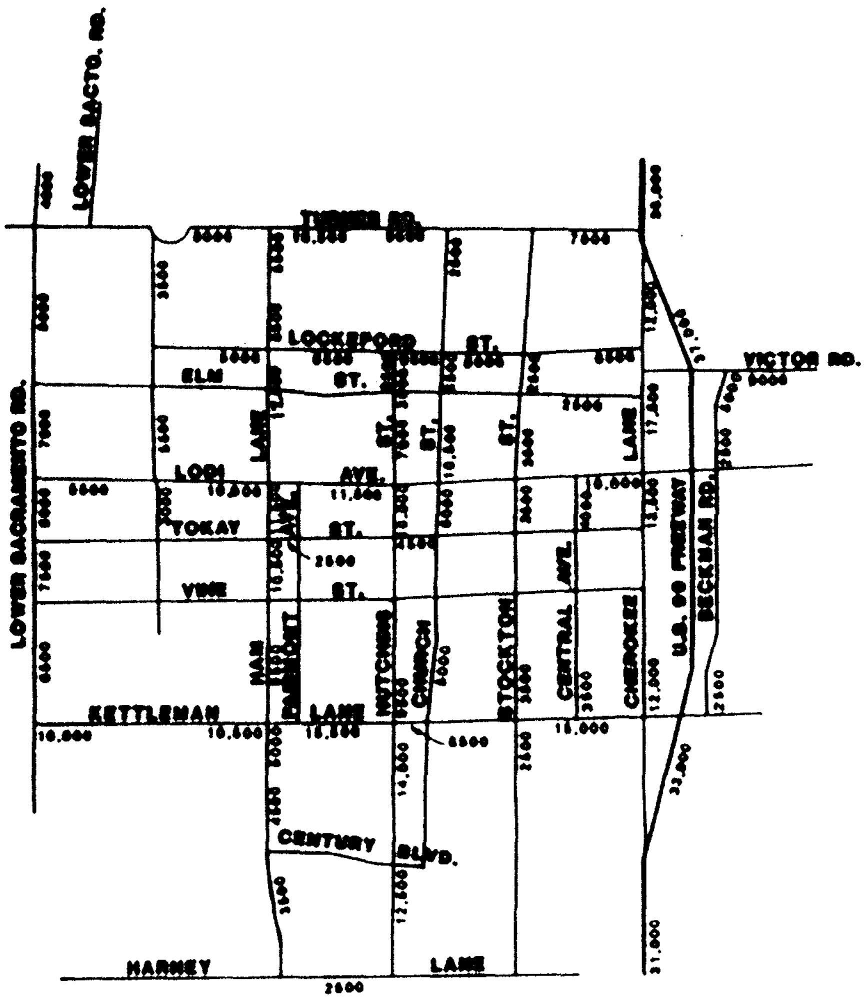


EXHIBIT 2

Average Daily Traffic Volumes (1980-1981)

3

EXHIBIT 1

Vicinity Map

of session. This secondary peak occurs during the 1:00 p.m. to 3:00 p.m. hour and is especially heavy in the southbound Ham Lane direction. The traffic volume for this move is 570 vehicles per hour. The a.m. peak hours vary depending on the time of year. During the school months there is a 7:00-9:00 a.m. peak but during the summer months the peak occurs from 11:00-1:00 in the midday.

1979-1980 average daily traffic volumes are shown on Exhibit 2 for general comparison of traffic flow on streets throughout the City of Lodi.

Turning Movements

Turning movements for both the a.m. and p.m. peak hours for Ham Lane intersections at Elm Street and Lodi Avenue were calculated from field observations.

Capacities

The capacities of Ham Lane in this study of existing conditions is the capacity of the critical intersection of Ham Lane and Lodi Avenue.

Current City of Lodi traffic counts, peak hour turning percentages calculated from field observations, and the updated Highway Capacity Manual signalized intersection capacity calculation methodology were used to determine operating conditions. The level of service for the intersection of Ham Lane and Lodi Avenue was calculated to be L.O.S.A and for Ham Lane and Elm Street L.O.S. of A. However, it must be noted that during certain parts of the day the southbound approach to the Ham Lane/Lodi Avenue intersection appears, from field observations, to operate at LOS C or worse.

FUTURE CONDITIONS

Traffic Projections

Traffic volumes were projected to the year 2005 for minimum, maximum and midrange values. The values were calculated using City of Lodi population growth rates, City of Lodi traffic counts, and City of Lodi General plan.

The minimum range values from the San Joaquin C.O.G. Traffic Study for Lodi were not used in this study because they were found to project future volumes lower than the existing 1984 traffic volumes.

The midrange traffic growth values were calculated using the historic population and traffic volume growth for the City of Lodi (1965-1984). An average rate of 1.7 percent was used to project traffic growth.

The maximum range was calculated using the historic growth rate in traffic volumes on Ham Lane (1965-1984). An average rate of 2.4 percent was used to project traffic for the section near Elm Street and 3.3 percent for the section near Lodi Avenue. The resulting traffic forecasts are based on the assumption that radical changes to the land uses in the area around Ham Lane would not occur and traffic volumes would increase at the same rate as they have in the past.

Exhibits 6 and 7 (presented later) show a comparison of the projected traffic volumes for the two ranges of projections to the three alternative roadway sections over time.

Improvements

Three alternatives for improvements to Ham Lane were evaluated. The three include:

I. Rebuild existing street (Alternative C), within the existing curb lines, improvements, such as restriping to add left-turn pockets, and limiting on-street parking would be done. Physical improvements would be limited to necessary curb repairs and pavement overlays. (See Exhibit 4)

II. Minor Improvements (Alternatives A & B). Some physical improvement to widen the existing roadway to accomodate a basic four-lane street. Channelization and limiting of on-street parking would also be needed. (See Exhibit 4)

III. Major improvements (Proposed Project). Major physical and channelization improvements, to accomodate a four-lane street with on-street parking. (See Exhibit 5)

These scenarios were then evaluated and alternative cross-sections were developed and analyzed.

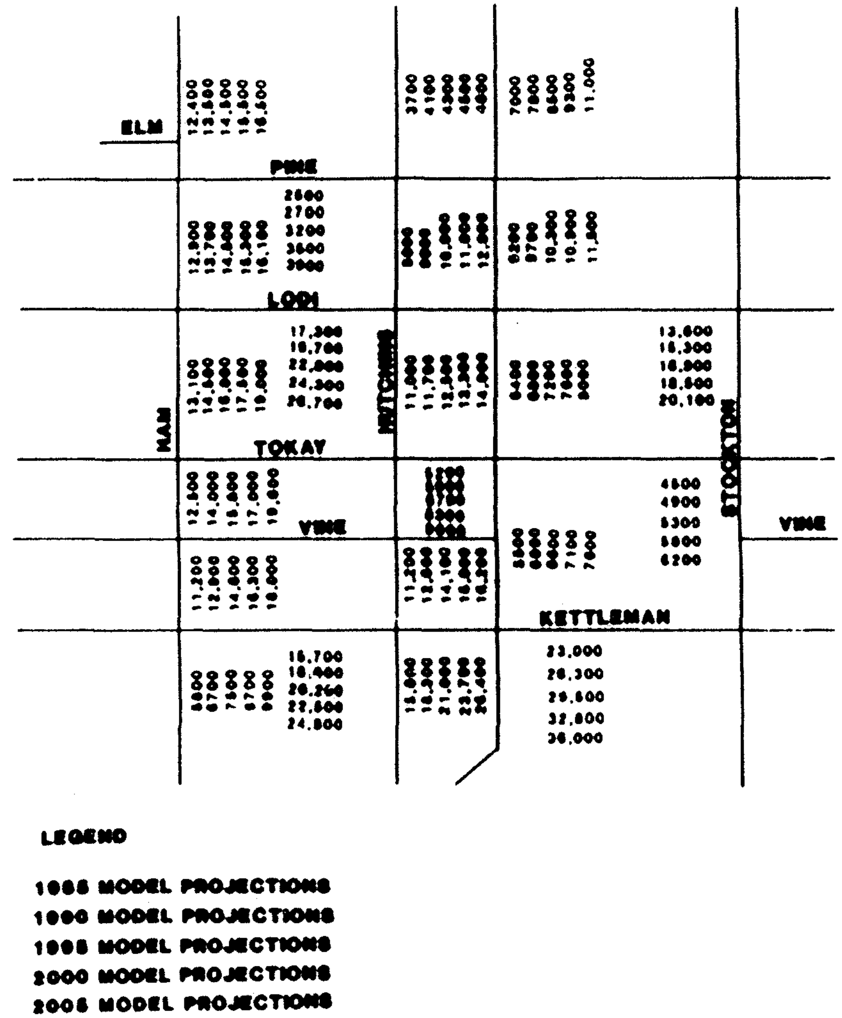
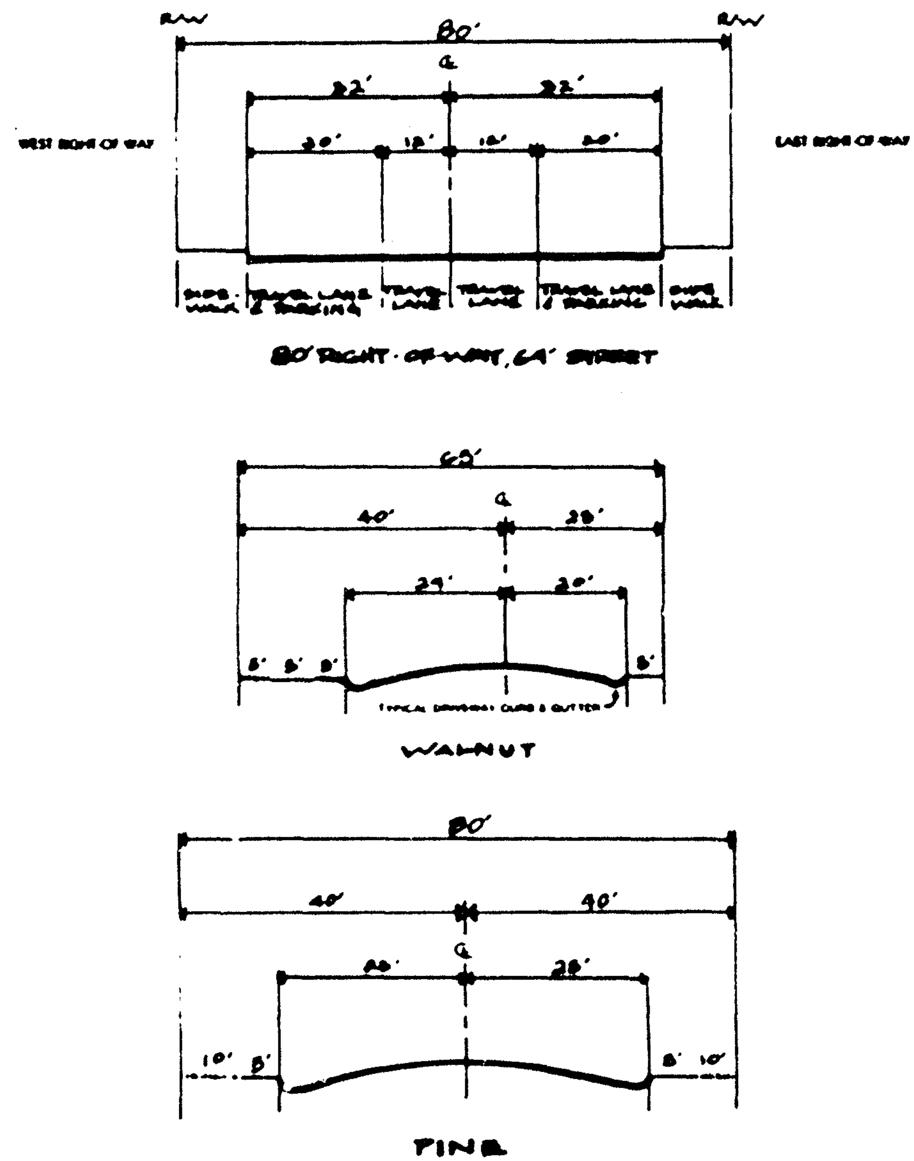


EXHIBIT 3

San Joaquin Council of Governments
Projected Traffic Volumes



NOTE ℄ IS A SECTION LINE AND NOT NECESSARILY THE CENTER LINE OF EXISTING ROADWAY

Ham Lane Section PROPOSED & EXISTING

Typical Mid Block

EXHIBIT 4

EXHIBIT 5

TRAFFIC ANALYSIS

The three potential improvement alternatives were analyzed for the segment of Ham Lane between Elm Street and Lodi Avenue.

Using roadway capacities, traffic demand, parking, through trip attraction, and the amount of right-of-way required as evaluating criteria, an analysis was conducted for each of the proposed Ham Lane improvement alternatives.

Rebuild Existing Street (Alternative C)

This alternative is an upgrading of the roadway within the limits of the existing curbs. Traffic control devices and pavement markings would be modified to improve capacity. Physical improvements would be limited to pavement repairs, overlays, utility improvements, and curb repairs.

Cross-Section

The roadway and right-of-way would be the same as the existing facilities. The current cross-section is mostly comprised of a paved roadway section of 48 to 50 feet. The roadway is not centered in a 64 foot right-of-way.

Parking

The improvements proposed in this alternative would reduce the amount of on-street parking spaces from 135 to 100. Thirty five spaces would be eliminated for left and/or right turn lanes at approaches to intersections.

Through Trips

Minimal additional through trips would be attracted to Ham Lane in this alternative as no physical improvements are proposed for this segment. The effects on Ham Lane are shown on the low end of the curves on Exhibits 6-7.

Physical Improvements

The improvements proposed in this alternative would consist only of striping and traffic control changes. Three areas would be affected. At the intersection of Ham Lane and Elm Street a right-turn pocket would be added on the south leg of Ham Lane, at Ham Lane and Pine Street a left turn lane would be added on the north approach of Ham, and left turn pockets would also be added at both approaches to the Ham and Walnut intersection.

Capacities

A capacity of 840 vehicles per hour in the peak hour and peak direction was used. This capacity is based on a combination of midblock and intersection capacities. Analysis of roadway capacity and traffic demand (see Exhibit 6-7) reveals that Alternative I would operate under capacity for Level of Service B through the year 1995.

Minor Improvements (Alternatives A & B)

This alternative would provide improvements that are moderate in scale. Right-of-way acquisition and physical improvements would be limited to that necessary to provide a basic four-lane roadway with on-street parking prohibited or restricted to certain times of day.

Cross-Section

The proposed cross-section of 70 feet of ROW and 56 feet of roadway would be wide enough for a four-lane road. At intersection this cross-section would accommodate four through lanes

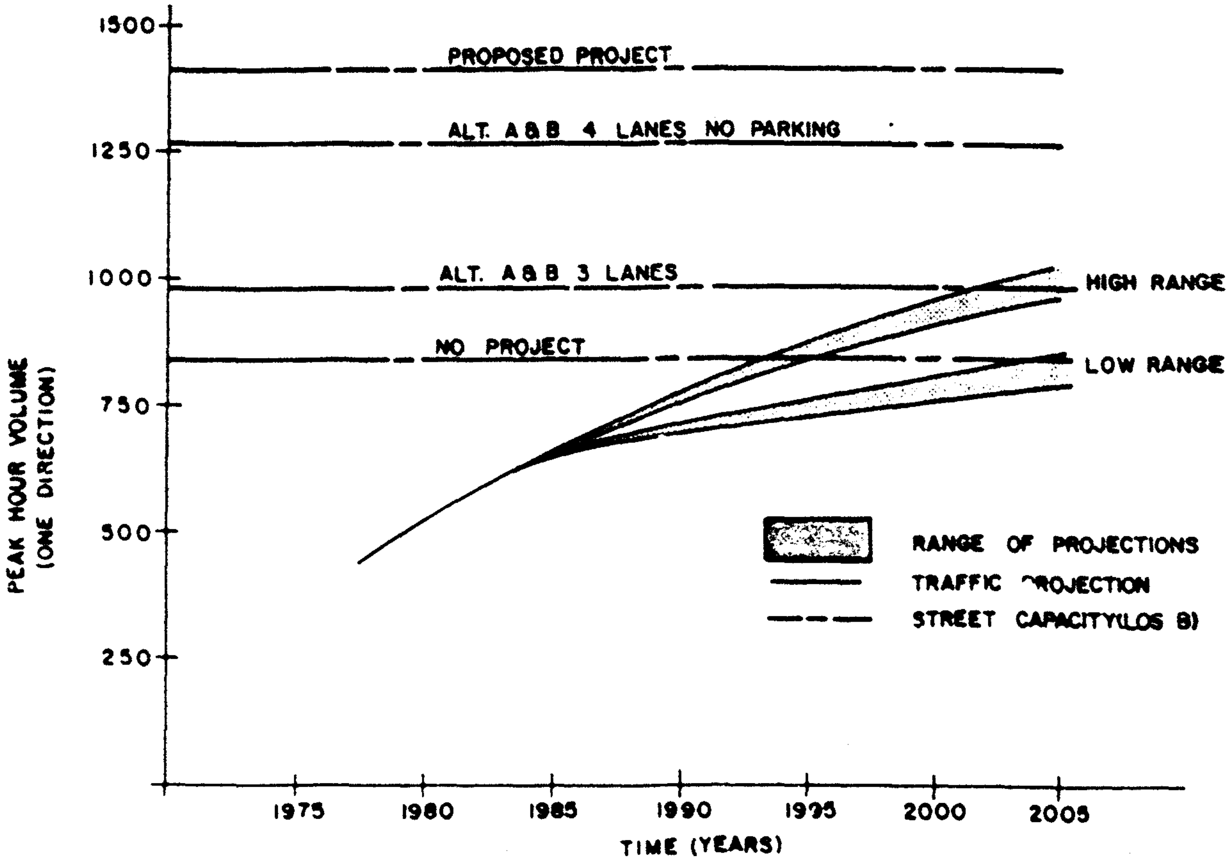


EXHIBIT 6

Traffic Projections and Street Capacities
Lodi to Pine

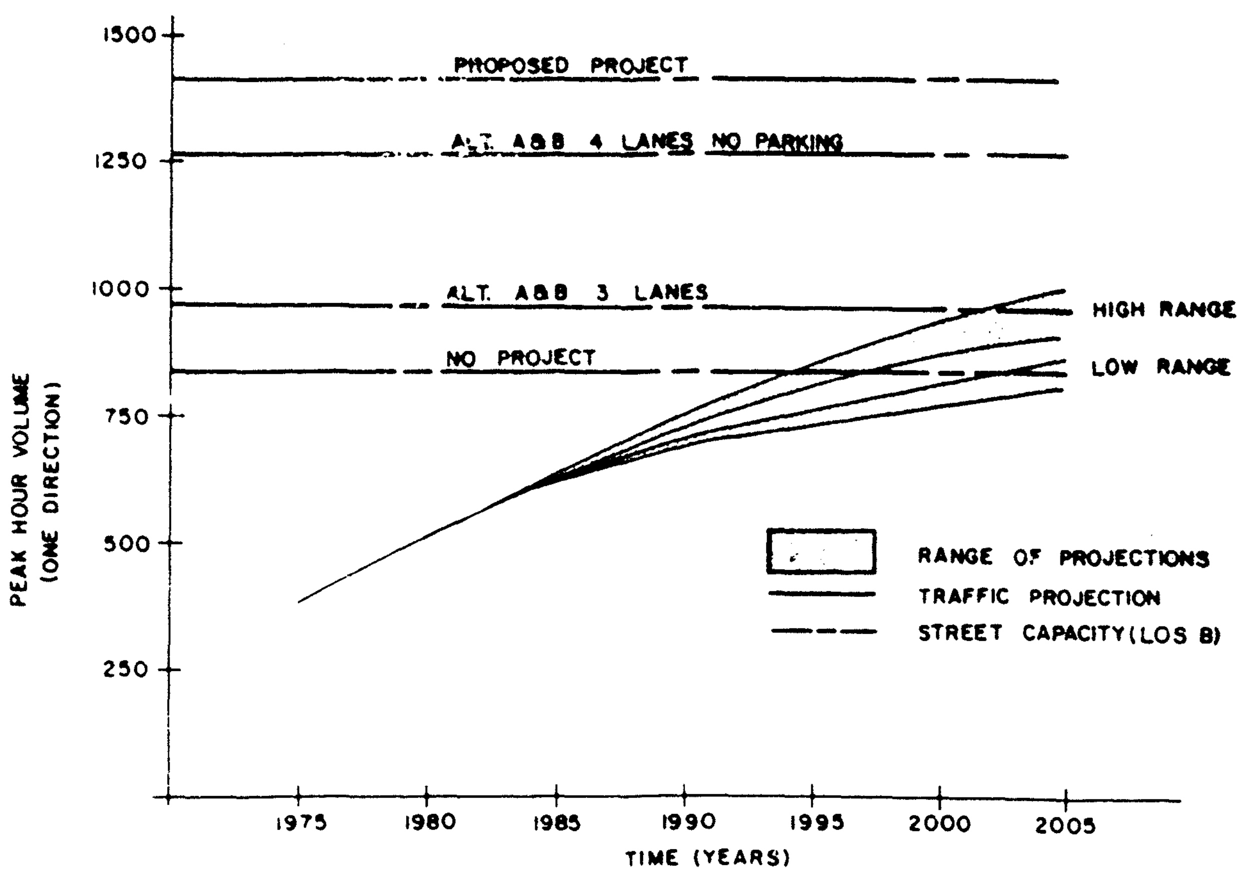


EXHIBIT 7

Traffic Projections and Street Capacities
Pine to Elm

and evaluating a service area for several north south arterials. Improvements to Ham Lane and its traffic control devices would reduce travel time and would attract trips that way have used other parallel facilities as routes between North Lodi and South Lodi/Stockton.

The additional 1,000 daily trips would add about 150 trips in the peak hour to the study section of Ham Lane. However, th peak direction for the through trips would be opposite the current peak direction for that segment, so only 50 trips would be added to the peak flows. The effects on Ham Lane south of Elm Street would be near the mid-range of the curves indicated on Exhibits 6 and 7.

Physical Improvements

For Ham Lane to be widened to 56 feet, it would have to be widened 4 to 6 feet on both sides of the roadway or 8 to 12 feet on either side. An additional 6 feet of R/W would have to be acquired to improve the current street to the proposed Alternative II cross section. New curbs and gutters, some sidewalks and pavement areas would be required. An overlay of the existing pavement would probably be necessary.

Capacity

The 56-foot, four-lane section provides a capacity of 1,270 vehicles per hour at Level of Service (L.O.S.) B during the peak hour in the peak direction. (Use of LOS C as a design criteria increases capacity by 10-15%). This is enough capacity to handle all the projected traffic demands for this segment of Ham Lane through the year 2005 at the design L.O.S. B. The three-lane section provides a capacity of 970 vehicles per hour in the peak direction and would handle all the projected traffic demands through the year 1998 at LOS B.

and a left-turn pocket, with substandard lanes. On street parking would be possible only at times when four traffic lanes were not required.

The 56-foot section does give a lot of staging flexibility. A three-lane section with on-street curbside parking, two travel lanes, and a continuous left-turn lane could also be accommodated.

Parking

In order to limit physical improvements and increase capacity, a majority of the unrestricted on-street parking would either be eliminated or converted into restricted parking. About 35 parking spaces would be eliminated. About 100 would be converted to restricted time parking and there would be no unrestricted spaces. In the restricted time parking space, parking would be allowed only during off-peak hours when the four-lane roadway was reduced to the center two lanes. The hours when parking would be prohibited would generally be from 7:00 to 9:00 in the morning and 2:00 to 6:00 in the afternoon.

If the three lane roadway section were implemented, unrestricted on-street parking could be provided along both sides of the street.

Through Trips

It is estimated that development of this alternative cros section could attract about 1,000 through trips from nearl, parallel arterials, primarily Hutchins Street and lower Sacramento Road. This would represent a 5-percent increase in year 2005 traffic on Ham Lane between Elm and Lodi.

This number was calculated by determining the existing difference in travel time between competing corridors, estimating how changes to Ham Lane would affect the travel time difference, Proposed Project

Major physical improvements and right-of-way acquisition would be needed to implement this alternative. Necessary improvements to accommodate a four-lane roadway with parking on both sides of the street are described below. This alternative would bring this section of Ham Lane up to the cross-section of the rest of Ham Lane.

Cross-Section

An 80-foot row with a 64-foot pavement section is proposed. This section would consist of four travel lanes with parking on-street for midblock section, and four travel lanes and a left-turn pocket at intersections. A sidewalk would be provided on both sides of the street.

Parking

Unrestricted on-street parking would be allowed at midblock locations. This would provide about 75 unrestricted on-street parking spaces between Lodi and Elm.

Through Trips

Using the same methodology as outlined in the through trip section of the previous alternative evaluation, it was determined that the proposed project improvements on Ham Lane would attract about 1,500 vehicles per day. This would be an increase of about 7 percent in year 2005 traffic volumes on Ham Lane between Elm and Lodi. This would add 100 vehicles per hour to the peak direction in the peak hour to the other segments of Ham Lane. The high range of the curves on Exhibits 6 and 7 indicate the effects on operating conditions for the segment of Ham Lane in this study.

Physical Improvements

To develop the proposed project cross-section the current roadway would have to be widened 8 to 10 feet on both sides, and 15 + or - feet on either side of R/W would need to be acquired. New curbside gutters, sidewalks, and pavement areas would be required. An overlay of the existing pavement would probably be necessary.

Capacity

With a capacity of 1,410 vehicles per hour during the peak hour in the peak direction the Alternative III cross-section would handle all the traffic demands to the year 2005 at a Level of Service A.

Mitigation

To mitigate the impacts of high school traffic a wider cross-section should be constructed to prevent any decrease in level-of-service below LOS B.

Pedestrian Safety

Due to an estimated increase in traffic speeds, higher volumes, and greater distances to cross, pedestrians will have to wait longer for adequate gaps in traffic to make a safe crossing. School children, Junior High School or younger and senior citizens are the most affected pedestrians.

Mitigation

Additional pedestrian safety devices may be needed. These would include additional crosswalks, roadway warning signs, school speed zones, and if necessary, traffic or pedestrian signals.

Cross Traffic

Because of higher traffic volumes and (if the proposed project is implemented more lanes to negotiate),cars on the side streets may have to wait longer to find a safe gap in traffic to make either left turns or to cross Ham Lane. Because of the high percentage of high school age drivers this problem could become more critical due to the inexperience of the young drivers causing traffic safety problems.

Mitigation

Traffic signals would be installed as warranted. This would give the right-of-way to the vehicles on the side streets so they could make the desired traffic movements. The 4-lane 56 foot section would aid the cross street vehicles by increasing sight distance through the removal of on-street parking.

IMPACTS AND MITIGATION

Roadway Capacity

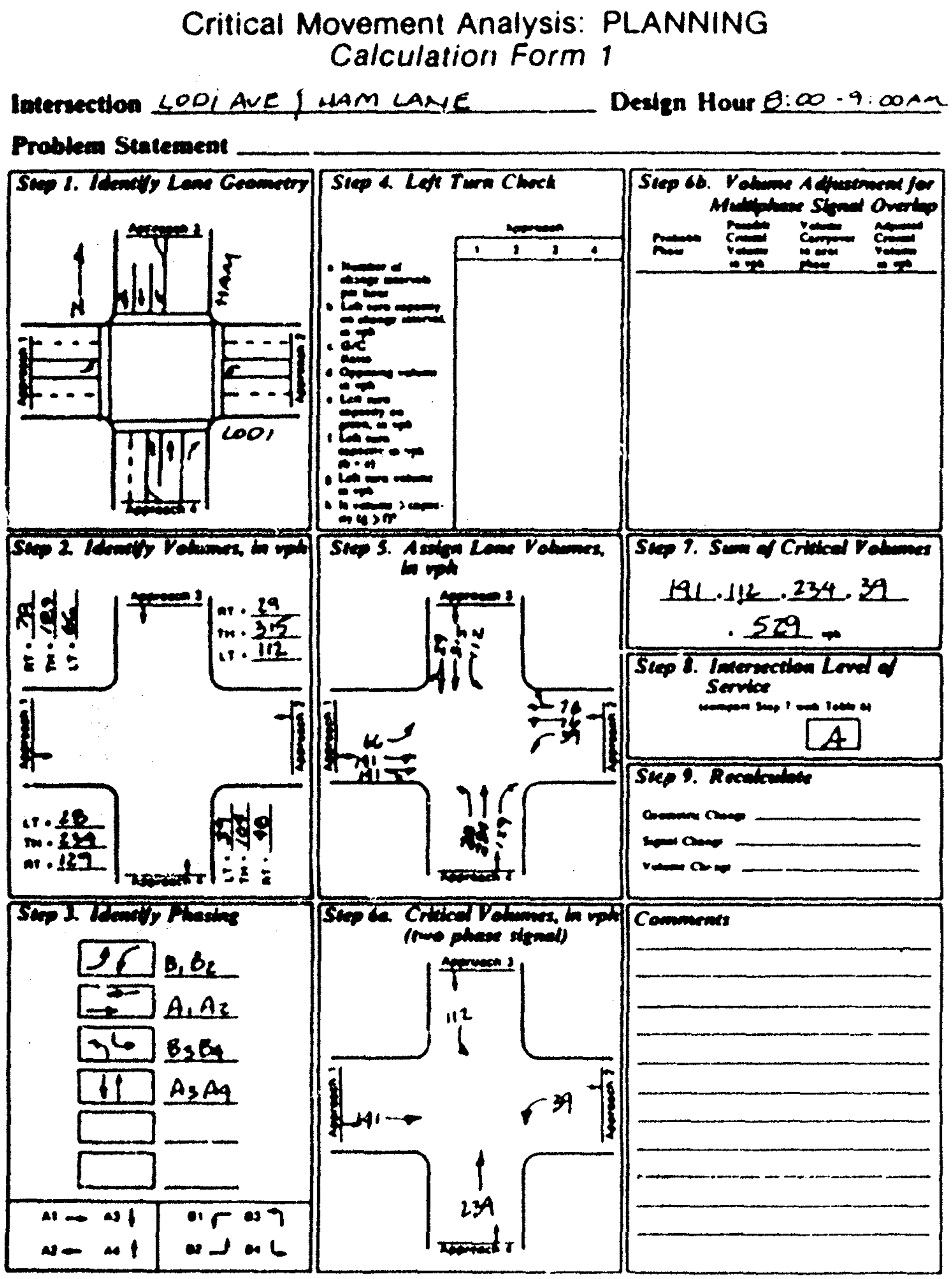
Traffic volumes will continue to increase in the future on Ham Lane as the City of Lodi continues to grow. As the traffic levels increase so will the levels of congestion. Currently the section of Ham Lane between Lodi Avenue and Elm Street operates at a level-of-service (LOS) A. This is projected to change as traffic volumes increase. Table 4 shows a comparison of the roadway cross section alternatives and the level-of-service that is projected for each roadway alternative versus three projected year 2005 traffic volumes. As can be seen from Table 4 all four cross-section/lane configuration alternatives will handle the projected minimum traffic levels at a LOS B or better through the year 2005. However, for the maximum level of traffic projected the existing and three-lane 56 foot cross-sections will experience periods of sub-level-of-service B and the existing cross-section will even experience periods of LOS D. Table 5 presents definitions of level-of-service operating conditions.

Mitigation

To eliminate any potential reductions in level of service below LOS C the section of Ham Lane between Lodi Avenue and Elm Street should be widened to a minimum of 56 feet curb to curb.

High School

Access to the Lodi High School is available off of Ham Lane. Because of this there is a secondary peak in traffic levels between 1:00 and 3:00 in the afternoon. This peak is nearly as high as the 4:00 to 6:00 peak hours and in the southbound direction causes traffic levels high enough to reduce the level of service on the study section, at the Ham and Lodi intersection southbound approach, to level of Service C or less, for the existing cross-section.



Vehicle Speeds

With any widening of the roadway cross-section, drivers may perceive the road to be safer to drive at higher speeds, thus overall vehicle speeds may increase. This is especially true with the large mix of high school drivers.

Mitigation

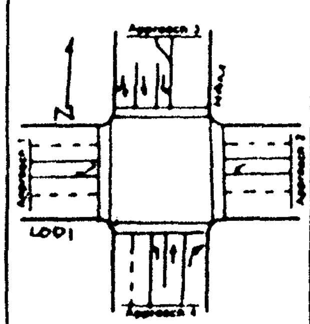
Speed limit signs and enforcement by local police can help to reduce speeds, however, even these measures may not be entirely successful.

Critical Movement Analysis: PLANNING
Calculation Form 1

Intersection LODI AVE / HAM LANE **Design Hour** 4:50 - 5:50PM

Problem Statement ____________

Step 1. Identify Lane Geometry



Step 2. Identify Volumes, in vph

Approach 3: RT: 38, TH: 168, LT: 51
Approach 2: RT: 35, TH: 209, LT: 61
Approach 1: LT: 89, TH: 282, RT: 89
Approach 4: LT: 75, TH: 132, RT: 128

Step 3. Identify Phasing

B1 B2
A1 A2
B3 B4
A3 A4

A1 → A3 ↓ B1 ↱ B3 ↰
A2 ← A4 ↑ B2 ↲ B4 ↳

Step 4. Left Turn Check

- Number of change intervals per hour
- Left turn capacity on change interval, in vph
- G/C Ratio
- Opposing volume in vph
- Left turn capacity on green, in vph
- Left turn capacity in vph (b + e)
- Left turn volume in vph
- Is volume > capacity (g > f)?

Approach 1	2	3	4

Step 5. Assign Lane Volumes, in vph

Approach 3: 89, 209, 61
Approach 2: 180, 180, 73
Approach 1: 34, 61, 180
Approach 4: 89, 292, 129

Step 6a. Critical Volumes, in vph (two phase signal)

61, 180, 34, 292

Step 6b. Volume Adjustment for Multiphase Signal Overlap

Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

Step 7. Sum of Critical Volumes

34 + 61 + 180 + 292 = 567 vph

Step 8. Intersection Level of Service

(compare Step 7 with Table 6)

A

Step 9. Recalculate

Geometric Change ____________
Signal Change ____________
Volume Change ____________

Comments

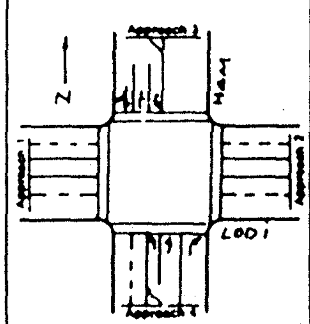
____

Critical Movement Analysis: PLANNING
Calculation Form 1

Intersection LODI AVE / HAM LANE **Design Hour** 1:40 - 2:40PM

Problem Statement ____________

Step 1. Identify Lane Geometry



Step 2. Identify Volumes, in vph

Approach 3: RT: 71, TH: 212, LT: 43
Approach 2: RT: 63, TH: 454, LT: 245
Approach 1: LT: 47, TH: 236, RT: 139
Approach 4: LT: 81, TH: 501, RT: 147

Step 3. Identify Phasing

B1 B2
A1 A2
B3 B4
A3 A4

A1 → A3 ↓ B1 ↱ B3 ↰
A2 ← A4 ↑ B2 ↲ B4 ↳

Step 4. Left Turn Check

- Number of change intervals per hour
- Left turn capacity on change interval, in vph
- G/C Ratio
- Opposing volume in vph
- Left turn capacity on green, in vph
- Left turn capacity in vph (b + e)
- Left turn volume in vph
- Is volume > capacity (g > f)?

Approach 1	2	3	4

Step 5. Assign Lane Volumes, in vph

Approach 3: 43, 285, 74
Approach 2: 174, 174, 81
Approach 1: 43, 142, 141
Approach 4: 47, 236, 139

Step 6a. Critical Volumes, in vph (two phase signal)

454, 81, 142, 47

Step 6b. Volume Adjustment for Multiphase Signal Overlap

Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph

Step 7. Sum of Critical Volumes

81 + 47 + 454 + 142 = 724 vph

Step 8. Intersection Level of Service

(compare Step 7 with Table 6)

A

Step 9. Recalculate

Geometric Change ____________
Signal Change ____________
Volume Change ____________

Comments

BY ADDING A LONGER SB LEFT TURN POCKET AND RIGHT TURN/THRU LANE THE INTERSECTION VPH IS 529.

Appendix C

Noise Analysis

Environmental Consulting Services

Noise
Air Quality
Energy

20430H Town Center Lane
Cupertino, CA 95014
(408) 257-1045

NOISE IMPACT AND MITIGATION STUDY

HAM LANE IMPROVEMENT PROJECT

City of Lodi, CA

August 27, 1984

Submitted to

Kate Burdick Land Use Planning

Auburn, CA

Prepared by

H. STANTON SHELLY

Principal Consultant

NOISE IMPACT STUDY - HAM LANE IMPROVEMENT PROJECT

INTRODUCTION

The Ham Lane Improvement Project is within the jurisdiction of the City of Lodi, as lead agency. This noise study is part of the Environmental Impact Report required by the California Environmental Quality Act, Public Resources Code section 21000.

I. EXISTING SETTING

A. Noise Sources in the Area

The primary source of noise in the project area is traffic on local streets, both on Ham Lane and on major cross streets such as Lodi Avenue and Elm Street. Peak passby noise levels for passenger vehicles are approximately 60-70 dBA at moderate speeds and at a distance of 25 feet. (See the Appendix for definitions of noise concepts and terminology.) Heavy trucks, motorcycles, and vehicles with faulty muffler systems produce peak passby noise levels of 70 to 90 dBA at 25 feet. Other sources of noise in the area -- overflying aircraft, barking dogs, and similar urban disturbances -- are present, but not significant contributors.

More distant sources, Southern Pacific Railroad activities one and a half miles east and Route 99 traffic two and a half miles east, contribute to the background level, and are noticeable in the absence of noise from nearby sources.

B. Ambient Noise Levels

The traffic noise level at a given location is a combination of many factors, including the traffic volume, the noise level of each vehicle, vehicle speed, and the distance to the road. As most urban dwellers are aware, the traffic noise level near a busy street varies over a wide range. To indicate easily the overall noise level, single number descriptors are usually used. The most common descriptor for a short period is the hourly L_{eq}, which indicates the energy average of the varying noise level, and has been shown to be a good indicator of people's perceptions of noise level. Over a longer period, the L_{dn} descriptor is used, which is the long-term average of L_{eq}, with 10 dB added to the noise level for the nighttime period.

With basic information about local traffic, the roadside noise level can be modeled (computed) fairly accurately, using equations that have been developed from field tests. The standard Highway Research Board traffic noise model (Reference 4), revised after extensive field measurements, has been used for this study. Roadside noise levels are estimated below for existing traffic on Nam Lane, at 40 feet from the center of the street (approximately the middle of the average yard).

Present Nam Lane Noise Levels (dBA)

LOCATION	Leq			Ldn
	Pk Hr.	Noon	1 am	
Front yards	71	70	58	72

These noise levels are based upon an Average Daily Traffic (ADT) volume of 12,500, and a peak hour volume of 1050 trips. The noise levels during periods other than the peak hour, and the L_{dn}, are based upon typical hourly variations of urban traffic throughout a normal day. Because of the relatively small front yards, and the reflection of noise from the houses, the noise levels are not substantially different at the houses than at the sidewalk (1-2 dBA less).

II. POTENTIAL NOISE IMPACTS OF THE PROJECT

A. Sensitive Receptors.

The majority of properties adjacent to Nam Lane in the project area are residential, with a few commercial uses and a church making up the remainder. Most of the residences are single- family, but a few are apartments and duplexes. There is only 100- 120 feet separating the homes on the West side of Nam Lane from those on the East side, so the distance to traffic is relatively small.

B. Project Traffic Noise Impacts

The project would construct four traffic lanes, plus either two parking lanes or a center turn lane, depending on the location. Traffic volumes have been projected in three growth scenarios between 1985- 2005, from minimum increases to high growth. Five basic project cases are evaluated for potential noise impacts, as shown below:

1. Four traffic lanes, two parking lanes
   Volume: 1[illegible]300 ADT (1985 High growth)

2. Four traffic lanes, two parking lanes
   Volume: 20300 ADT (1995 High growth)

3. Four traffic lanes, two parking lanes
   Volume: 25300 ADT (2005 High growth)

4. Four traffic lanes, center turn lane
   Volume: 25300 ADT (2005 High growth)

5. No Project - Two traffic lanes
   Volume: 25300 ADT (2005 High growth)

Average traffic speeds are estimated at 30 mph during peak hour, and 35 mph at other times, in cases 1 through 4. Case 5 would be seriously congested; speeds of 20 mph or less during peak hour, and 25 mph otherwise, are assumed.

Traffic data are from the project traffic study by TJKM Traffic Consultants, Sacramento. The long- term L_{dn} descriptor was computed from a typical urban hourly traffic distribution (see Appendix page A-1).

The results of the noise modeling studies are given in Table 1 below. The front-yard location in each case is the same as for the ambient noise levels in the previous section, 40 feet from the center of the road.

Table 1 - NAM LANE ROADSIDE NOISE LEVELS (dBA)

CASE	L_{eq}	L_{dn}
1. 1985 - 4 lane, 2 parking	72	73
2. 1995 - 4 lane, 2 parking	73	74
3. 2005 - 4 lane, 2 parking	74	76
4. 2005 - 4 lane, 1 turn	76	77
5. 2005 - 2 lane (existing)	69	71

The cases modeled do not include all possible combinations of volumes and lane configurations. For example, the cases covering only modest traffic growth in the next 20 years are not presented. However, the cases which have the highest noise potential are included. If the high- growth traffic projections do not occur, lower noise levels would be generated.

Table 1 demonstrates the relative effects of traffic volume, average vehicle speed, and distance on the noise level, when compared to present noise levels. Traffic in the basic project

cases (#1, 2, 3) is about 10 feet closer than for the present two- lane configuration. Noise levels increase due to progressively higher volumes.

Cases 3, 4, and 5 have the same high- growth volume, while road cross- section (and receptor/vehicle distance) changes. Case 4 eliminates two outer parking lanes for a center turn lane, which brings the moving vehicles another 7 feet closer to the residential receptors, and increases noise levels by 1-2 dBA.

Case (#5) is No-Build in 2005. The distance is the same as at present, and because of congestion and low average speeds, noise levels would be 5-6 dBA less than for the 2005 Project cases.

It should be noted that receptors not on Nam Lane, behind those directly facing the project, are exposed to 14-18 dBA less noise because of the combination of greater distance and the partial shielding provided by the buildings. The <u>changes</u> in project traffic noise for other receptor locations would be approximately the same as for those located on Nam Lane. However, Nam Lane traffic is <u>not</u> a dominant source of noise for receptors on other streets.

C. Discussion of Potential Project Traffic Noise Impacts

Two aspects are important when considering potential noise impacts of a project: the increase in noise level due to the project, and the project noise level itself.

From Table 1, traffic noise along Nam Lane could increase 3 to 5 dBA in the next 20 years with project implementation. In general, noise increases of 2 dBA or less usually are not noticable, unless the character of the noise is also changed significantly. Noise increases of 3 - 5 dBA are definitely noticeable, and are potentially disturbing. The character of the noise is again important in the amount of disturbance caused. In the Ham Lane case, a 5 dB increase in steady traffic noise over 20 years might not cause problems (it is typical in many urban locations). However, an increase in individual loud vehicles could cause considerable disturbance.

To evaluate the potential impact because of the overall noise level, land use planning guidelines for noise are used. The City of Lodi has adopted the San Joaquin County Noise Element (Reference 5), which recommends compatible uses for various noise levels. The suggested L_{dn} noise levels for residential land uses are outlined in Table 2.

Table 2 - Recommended Noise levels for Residential Uses

LAND USE CATEGORY	L_{dn} RANGE
Normally Acceptable	Less than 60 dBA
Conditionally Acceptable	55 - 70
Normally Unacceptable	70 - 75
Clearly Unacceptable	Above 75

The guidelines are intended to assist in decisions about new residential construction, but they are useful in evaluating existing uses also. In terms of Noise Element guidelines, present noise levels adjacent to Ham Lane exceed recommendations, and the project would increase those levels 2 to 5 dBA. In addition, acceptable interior noise levels should be less than 45 dBA L_{dn} due to exterior sources. This requirement is contained in State Title 25 - Section 1092, Noise Insulation Standards, which apply to any new multi-family residential construction.

Standard residential building design and construction methods generally reduce outdoor noise by 20 to 25 dBA, with windows closed and no significant cracks or openings around windows or doors. With the best residential construction

methods, and traffic noise levels of 70 dBA, Ham Lane interior noise levels would meet 45 dBA (L_{dn}) indoor standards. However, if windows are opened, interior noise levels will be only 10 to 15 dBA less than outdoors. This means that to achieve a 45 dBA interior noise environment, windows should be sealed, and forced ventilation provided. To deal with noise levels higher than 70 dBA, other improvements to the structures could be needed. See Section III, Mitigation Measures.

D. Construction Noise

The initial site preparation phases would bring various types of demolition and excavation machines to the site, such as bulldozers, backhoes, and large dump trucks. These generally have diesel engines and produce 80 to 90 dBA at a distance of 50 feet under full load. Jackhammers would be utilized for concrete and blacktop removal, which generate 85 to 90 dBA noise levels at 50 feet.

Second phase activities require similar equipment, and produce similar noise levels. After removal of the existing road surface, curbs, and sidewalks, the surface would be graded. Trucks would bring in the base materials to graded and rolled. Blacktop trucks and concrete mixing trucks bring the top surface materials. Final surface preparation by large rollers produces noise levels of 85 to 95 dBA at 50 feet.

The residential properties along Ham Lane would be the primary receptors for the temporary construction noise. For a period of four to eight weeks, sporadic noise levels of 80 to 90 dBA would be experienced. Although construction equipment would be idling part of the time, and would be producing maximum noise levels infrequently0, intermittant construction noise disturbance is likely on all adjacent properties.

Supplement to Ham Lane Noise Impact and Mitigation Study

Discussion of Low Barrier for Traffic Noise Mitigation

In most roadside receptor situations, with a setback of at least 35 feet from the roadway, a 2 1/2 foot barrier at the sidewalk would provide 3-4 dBA noise reduction on the first floor of the residences and in the part of the front yard near the house.

On Ham Lane, with setbacks from the curb of only 10- 20 feet, the view of the road surface (where much of the noise is generated) would not be significantly blocked by the barrier, and a reduction in noise level of 1-2 dBA would not be perceived as a noticeable noise reduction.

HSS
H. Stanton Shelly
Acoustical Consultant
9/12/84

III. MITIGATION MEASURES

The following mitigation measures are possible alternatives for reducing Ham Lane Improvement Project noise impacts. Each must be evaluated with respect to other project objectives such as budget, aesthetics, schedules, and City policies.

Traffic Noise

1. Although often undesirable for traffic engineering reasons, reducing average speeds on Ham Lane would reduce noise levels effectively.

2. Reduce local traffic volumes by improving desirability of alternatives to the automobile, such as car pools, bicycle, and public transit.

3. Construct a low masonry barrier (2 - 2½ feet high) along the front of residential properties. This would provide about 3 dBA of noise reduction without enclosing the yard or impairing the view.

4. Enforce California Vehicle Code prohibitions against faulty or modified loud exhaust systems -- Sections 27150 and 27151. This can be implemented by local law officers without noise monitoring equipment to eliminate the worst offenders.

Construction Noise

1. Choose construction equipment which is of quiet design, has a high quality muffler system, and is well-maintained.

2. Install superior mufflers and engine enclosure panels when required on gas, diesel or pneumatic impact machines.

3. Restrict hours of use for motorized equipment -- for example, 7:30 am to 5:30 pm, Monday through Friday.

4. Eliminate unnecessary idling of machines not in use.

5. Use good maintenance and lubrication procedures to reduce operating noise.

Architectural and Structural Modifications

1. Windows facing major streets should either be tightly sealed and caulked (with the associated interior venilation system), or have a tight fit when closed, to shut out exterior noise.

2. Improve window noise reduction by replacing single-pane windows with double pane, or "safety" laminated, types.

3. Doors facing noise sources should be solid core with a tight fit when closed (weatherstripped), and no mail slots or other openings.

NOISE REFERENCES

1. Community Noise, U. S. Environmental Protection Agency, Office of Noise Abatement and Control, Washington, D.C., December 1971.

2. Proceedings, Conference on Noise as a Public Health Hazard, American Speech and Hearing Association, Washington, D.C., June 1968.

3. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, U.S. Environmental Protection Agency, Office of Noise Abatement and Control, Washington, D.C., March 1974.

4. Highway Noise - A Design Guide for Highway Engineers, National Cooperative Highway Research Program Report 117, Highway Research Board, National Academy of Sciences, Washington, D.C., 1971. Model revised by S. Shelly for improved accuracy.

5. Noise Element of the San Joaquin County General Plan, San Joaquin County Planning Department, Stockton, CA, November 1978.

APPENDIX

Environmental Noise Measurement and Analysis Procedure

1. Select monitoring site in terms of existing noise sources, receptor areas, topography, and noise transmission characteristics.

2. Make field noise measurements of individual sources and long-term statistical variation on the project site (15-30 minutes at a time in each location). Equipment used:

   Metrosonics Model 601 dB Noise Distribution Analyser

   Bruel and Kjaer Model 2206 Precision Sound Level Meter

   Bruel and Kjaer Model 4230 Calibrator

4. Record peak noise levels for individual sources and incidents, and the statistical descriptors of interest computed by the Noise Distribution Analyser, such as L_{50}, L_{10} and L_{eq}.

5. Based upon field measurements and transporation noise modeling data (for traffic, modified Highway Research Board Report 117), determine source/distance relationships on the site.

6. Compute L_{dn} values from measured statistical descriptors and typical variation of traffic volumes throughout the day:

Period	Hrs.	Hrly. Vol (% ADT)	Period	Hrs.	Hrly. Vol (% ADT)
A. 7 am - 9 am	2	7.5	D. 7 pm - 10 pm	3	4.0
B. 9 am - 4 pm	7	5.6	E. 10 pm - 12 Mid.	2	2.5
C. 4 pm - 7 pm (No peak)	2	7.0	F. 12 Mid- 7 am	7	0.7
			G. Peak Hour	1	10

To compute L_{dn}, where L_x is the L_{eq} for period X:

$$L_{dn} = 10 \text{ LOG } \frac{1}{24} \left\{ 2(10^{\frac{LA}{10}}) + 7(10^{\frac{LB}{10}}) + 2(10^{\frac{LC}{10}}) + 3(10^{\frac{LD}{10}}) + 2(10^{\frac{LE+10}{10}}) + 7(10^{\frac{LF+10}{10}}) + (10^{\frac{LG}{10}}) \right\}$$

APPENDIX

Environmental Noise Concepts and Definitions

Sound is the rapid fluctuation of air pressure higher and lower than normal atmospheric pressure. The term noise is often used to mean unwanted or undesirable sound, but this is a very subjective matter depending upon the individual, and so the terms noise and sound are often considered interchangeable in normal usage. The frequency of the sound, or pitch, if it is a pure tone, is the number of fluctuations of air pressure each second. If the sound frequency is within a certain range, generally considered 20 to 20,000 cycles per second (Hertz), the sound is considered audible to most persons with good hearing. Another characteristic of sound is its relative loudness, usually measured in decibels (dB), a shorthand logarithmic unit which avoids having to deal in the extremely large numbers describing sound in its basic engineering units. In other words, 120 dB, which would be experienced by standing close to a modern jet airplane taking off, is not 120 times as loud as a sound of 1 dB (the very faintest sound which the ear can hear) but rather nearly one million times as loud. Examples of various common noise sources and their relative loudness are found on Page A-8 of the Appendix.

The basic issue in dealing with community and environmental noise is its effects, and the way it is perceived by most persons. (See the Effects Section, page A-9). Therefore the noise must be measured, described and then compared to guidelines, regulations, and known effects. For these purposes the decibel is used with an "A weighting" function, meaning only that the lower and higher frequencies are de-emphasized similar to human hearing, rather than having a "flat" frequency response (which the stereo industry considers standard). Unless otherwise stated all references to decibels

H. Stanton Shelly
Acoustical Consultant

relative to human effects and community noise are "A-weighted" decibels, or dBA, in the usual abbreviated form. These weighted decibel values are then referred to as noise levels, or sound levels. The equipment used to measure noise levels is called a Sound Level Meter.

In spite of the tendency to describe environmental noise levels with single-number descriptors for simplicity, the most characteristic feature of the noise people experience in their urban communities is its extreme variability. So to better understand what a given noise environment is really like, more information about it is often presented by using more than one descriptor. For example, the average noise level may be accompanied by the maximum or highest noise level, and also the minimum noise level occurring during a particular time period. In some cases it is more important to know that, for example, the minimum noise level is 45 dBA and the maximum noise level is 90 dBA, than that the average noise level is 55 dBA.

There are literally dozens of different types of noise descriptors, each developed to give information on the effects of specific types of noise under certain conditions--for aircraft noise, for speech intelligibility, and for activity interference. But in recent years most governmental agencies in the U.S. have been recommending use of either L_n, L_{eq}, or L_{dn}. L_n, where n is a number in percent, refers to the noise level in dBA which is exceeded n percent of the time. For example, traffic noise may be generated along a freeway such that at 100 feet from the roadway 70 dBA is exceeded ten percent of the time (and ninety percent of the time the noise is less than 70 dBA). The L_{10} noise level for that location is then 70 dBA. The L_{50}, or median noise level, is also often used as a descriptor. The equipment for measuring statistical noise descriptors is called a Noise Distribution Analyser.

L_{eq} is the energy equivalent noise level, otherwise defined as the single steady noise level which has the same sound energy as the actual widely-varying noise level being described. L_{dn} is essentially the same as L_{eq} except that during the night time period from 10:00 p.m. to 7:00 a.m. a 10 dB "penalty" is added to account for the expectation of a more quiet environment at night. In other words, a location with a 55 dBA daytime L_{eq} would only have an L_{dn} of 55 if the noise level during the night dropped at least 10 dBA.

The ambient noise level refers to the combination of all sources of noise which make up the noise experienced at a given location. The background noise refers to the combination of distant sources which determine the minimum sound levels in any location. In statistical descriptors the L_{90} or L_{99} level is often used as a measure of the background noise level.

To more readily be able to understand and compare the differences in noise levels from one location to another, equal noise contours are often developed for a given site. Contours can be constructed for L_{10}, L_{dn}, L_1, or any other appropriate descriptor, depending upon their intended purpose. Most often, L_{10} or L_{dn} contours are used, joining locations on a site which have the same L_{10} or L_{dn} noise levels in 5 dB increments, similar to joining places of equal elevation on a topographic contour map. Noise contours are helpful and effective in land use planning and in developing noise mitigation measures.

Two concepts are particularly important in dealing with noise mitigation, noise reduction, or noise attenuation, three terms having the same meaning in general usage. Each term means to lower noise levels in the area of concern through one or more techniques. Reflection is one common noise reduction method, which diverts sound energy from a location of high impact

to an area of less impact, such as with a noise barrier. Noise absorption is a mechanism by which some materials, such as thick grass outdoors, or spun fiberglas batts (home insulation), convert incident sound energy into heat rather than reflecting it.

Mathematical noise models are often used in making analyses of noise environments as a supplement to normal field noise measurements, or for projecting future noise conditions which cannot be measured. Noise modeling refers to using previously measured and analyzed relationships between noise source characteristics and physical and geometrical conditions to estimate noise levels. A number of models for projecting aircraft noise, highway vehicle noise and railroad noise have been developed by or under contract to several governmental agencies, and are presently in widespread use and acceptance.

APPENDIX

THE EFFECTS OF NOISE ON PEOPLE

Noise is a part of our modern society -- noise from motorized labor-saving devices, transportation vehicles, and recreation devices. The use or conversion of energy for any purpose is seldom accomplished silently. We as humans have a capacity to tolerate or ignore a certain amount of our noise environment. But adverse effects are present in many exposures to noise, and dangers to health other than outright hearing impairment are also recognized.

The problem of controlling noise is difficult because it affects each individual in a different way. People do not hear sounds alike, nor do they perceive sounds similarly, hence they do not react to sounds in the same way. First of all, each person's reaction to noise will depend on characteristics of the noise itself:

1. loudness or intensity
2. frequency content
3. duration
4. repetition rate
5. time of occurrence
6. unfamiliarity or uniqueness.

But the effect of noise on people is also determined by characteristics of the listener or the situation:

7. background or ambient noise level
8. individual sensitivity to noise
9. activity or preoccupation of listener
10. perceived need or justification for noise.

A combination of factors determines how much a person will be disturbed by a noise, depending upon the individual, the noise, and the situation, but the effect will fall into one of the following categories: physiological effects, psychological/emotional effects, and activity interference.

As an orientation to the use of the decibel as a measure of relative loudness, a list of common noise sources and their approximate sound levels are given in Page A-8.

H. Stanton Shelly
Acoustical Consultant

Physiological Effects

At relatively high noise levels above 80 dBA, the delicate internal ear mechanism can be altered to cause Temporary Threshold Shift (TTS), resulting in partial deafness for a period of a few minutes to a few weeks, depending upon the noise level and the exposure time. If these excessive levels over 80 dBA are continued over long periods of time -- for example, 8 hours per day for several years, or if very high levels (over 100dB) are experienced for shorter periods, Permanent Threshold Shift (PTS) may result, meaning that irreversible loss in normal hearing capacity has occurred.

Fortunately, few exposures to levels causing hearing damage occur in the general community noise environment. However, some problems may occur for those choosing to attend or participate in musical and recreational events with high sound levels, or for persons engaged in occupations involving high noise levels (Occupational noise is regulated by State and Federal Occupational Safety and Health Regulations). But the potential for other less obvious noise effects exists throughout a normal daily schedule -- at home, school, shopping center, park, or highway. These various noise impacts can cause subtle physical, mental, and emotional stresses of varying degrees of seriousness.

Activity Interference

Noise disrupts human activities such as sleep, conversation, or stereo and TV enjoyment. Studies have shown that noise not only may prevent sleep by its intensity or characteristics but may seriously disturb the quality of sleep without fully awakening the sleeper. Conditions such as these -- community noises causing bedroom levels between 35-50 dBA -- are encountered to some extent throughout all urbanized areas. At noise levels over 55 dBA all types of normal listening activities are disrupted by noise. Speech intelligibility drops sharply, music listening and TV watching become strained, and aural communications in general must be carried out at much higher volumes to be successful. Obviously, shouting to be heard and understood is both undesirable and unpleasant for all concerned.

Psychological and Emotional Impacts

Less well documented and understood, but probably more widely experienced, are those impacts of noise which cause such subtle effects as distraction, annoyance, startle, privacy or relaxation interruption, stress, and tension. These effects as a class can, if continued, cause very serious emotional and psychological anxieties and disturbances. Often the cause of these reactions is not directly related to the noise environment, as the listener is not consciously aware of the noise intrusion. We may only be aware of an increased irritability and uneasiness. Our unusual human ability to "tolerate" or "adapt to" disturbing noise levels thus can incur a penalty upon our subconscious body processes over an unusually wide range of noise levels. So protection against the intrusion of disturbing noise is particularly important to mental and emotional health in an active and complex urban community.

TYPICAL NOISE SOURCES	NOISE LEVEL (dBA)	TYPICAL HUMAN RESPONSE
Jet aircraft take off (50')	130	
Auto horn (3')	120	Pain & Hearing Damage
Rock music in a night club	110	
	105	Possible Permanent Hearing damage
Motorcycle accelerating, no muffler (25')	100	
	95	Temporary Hearing Loss
Motorcycle accelerating, stock muffler (25')	90	Uncomfortable
Food blender (3') Power lawn mower (20')	85	Very Disturbing
Steady urban traffic (25')	70	Communications Difficult
Normal conversation (3')	60	
Daytime street, no nearby traffic	50	
	45	Sleep Disturbance
Quiet office	40	
Inside quiet home. Soft whisper (10')	30	Very quiet
Movie or recording studio	20	Seldom-experienced ambient
	10	Barely audible
Threshold of hearing	0	

A decibel "A-weighted" (dBA) is a unit of measurement indicating the relative intensity of a sound as it is heard by the human ear. An increase of 10 dBA indicates a noise level increase of about three times, but only a doubling in perceived loudness.

Appendix D

Air Quality Analysis

Environmental Consulting Services

Noise
Air Quality
Energy

20430H Town Center Lane
Cupertino, CA 95014
(408) 257-1045

AIR QUALITY IMPACT AND MITIGATION STUDY

HAM LANE IMPROVEMENT PROJECT

City of Lodi, CA

August 31, 1986

Submitted to

KATE BURDICK LAND USE PLANNING

Auburn, CA

Prepared by

M. STANTON SHELLY

Principal Consultant

HAM LANE WIDENING PROJECT

AIR QUALITY SECTION

INTRODUCTION

The air quality of a given area is not only dependent upon the amount of air pollutants emitted locally or within the air basin, but also is directly related to the weather patterns of the region. The wind speed and direction, the temperature profile of the atmosphere, and the amount of humidity and sunlight determine the fate of the emitted pollutants each day, and determine the resulting concentrations of air pollutants defining the "air quality."

I. EXISTING SETTING

A. Regional Climate.

The San Joaquin Valley climate is a Mediterranean type, characterized by mild and rainy winters, and hot and nearly dry summers. There is a high percentage of sunshine, over 80% of the daylight hours from April to October.

During the summer the Pacific high pressure system typically sits near the California coast, pushing oncoming ocean-formed storm systems north through the northwest states and Canada. Subsidence of warm air aloft associated with this system creates the frequent summer atmospheric temperature inversion and stagnated conditions. (See the Appendix for definitions of commonly-used meteorological and air quality terms.) Average maximum temperatures during the summer in the Stockton - Lodi region are near 90° F., and average evening minimums are near 55° F.

During the winter the Pacific high pressure system moves southward, allowing storms to move through Central California. As they approach, winds are typically from the southeast, and as the storm passes they turn northeast. Gusting winds of 20 to 40 mph are common during storms. With

NOISE REFERENCES

1. Community Noise, U. S. Environmental Protection Agency, Office of Noise Abatement and Control, Washington, D.C., December 1971.

2. Proceedings, Conference on Noise as a Public Health Hazard. American Speech and Hearing Association, Washington, D.C., June 1968.

3. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, U.S. Environmental Protection Agency, Office of Noise Abatement and Control, Washington, D.C., March 1974.

4. Highway Noise - A Design Guide for Highway Engineers. National Cooperative Highway Research Program Report 117, Highway Research Board, National Academy of Sciences, Washington, D.C., 1971. Model revised by S. Shelly for improved accuracy.

5. Noise Element of the San Joaquin County General Plan. San Joaquin County Planning Department, Stockton, CA, November 1978.

H. Stanton Shelly
Acoustical Consultant

APPENDIX

Environmental Noise Measurement and Analysis Procedure

1. Select monitoring site in terms of existing noise sources, receptor areas, topography, and noise transmission characteristics.

2. Make field noise measurements of individual sources and long-term statistical variation on the project site (15-30 minutes at a time in each location). Equipment used:

   Metrosonics Model 601 dB Noise Distribution Analyser

   Bruel and Kjaer Model 2206 Precision Sound Level Meter

   Bruel and Kjaer Model 4230 Calibrator

4. Record peak noise levels for individual sources and incidents, and the statistical descriptors of interest computed by the Noise Distribution Analyser, such as L_{50}, L_{10} and L_{eq}.

5. Based upon field measurements and transporation noise modeling data (for traffic, modified Highway Research Board Report 117), determine source/distance relationships on the site.

6. Compute L_{dn} values from measured statistical descriptors and typical variation of traffic volumes throughout the day:

Period	Hrs.	Hrly. Vol (% ADT)	Period	Hrs.	Hrly. Vol (% ADT)
A. 7 am - 9 am	2	7.5	D. 7 pm - 10 pm	3	4.0
B. 9 am - 4 pm	7	5.6	E. 10 pm - 12 Mid.	2	2.5
C. 4 pm - 7 pm (No peak)	2	7.0	F. 12 Mid- 7 am	7	0.7
			G. Peak Hour	1	10

To compute L_{dn}, where L_x is the L_{eq} for period X:

$$L_{dn} = 10\ \mathrm{LOG}\ \frac{1}{24} \left\{ 2(10^{\frac{LA}{10}}) + 7(10^{\frac{LB}{10}}) + 2(10^{\frac{LC}{10}}) + 3(10^{\frac{LD}{10}}) + 2(10^{\frac{LE+10}{10}}) + 7(10^{\frac{LF+10}{10}}) + (10^{\frac{LG}{10}}) \right\}$$

APPENDIX

Environmental Noise Concepts and Definitions

Sound is the rapid fluctuation of air pressure higher and lower than normal atmospheric pressure. The term noise is often used to mean unwanted or undesirable sound, but this is a very subjective matter depending upon the individual, and so the terms noise and sound are often considered interchangeable in normal usage. The frequency of the sound, or pitch, if it is a pure tone, is the number of fluctuations of air pressure each second. If the sound frequency is within a certain range, generally considered 20 to 20,000 cycles per second (Hertz), the sound is considered audible to most persons with good hearing. Another characteristic of sound is its relative loudness, usually measured in decibels (dB), a shorthand logarithmic unit which avoids having to deal in the extremely large numbers describing sound in its basic engineering units. In other words, 120 dB, which would be experienced by standing close to a modern jet airplane taking off, is not 120 times as loud as a sound of 1 dB (the very faintest sound which the ear can hear) but rather nearly one million times as loud. Examples of various common noise sources and their relative loudness are found on Page A-8 of the Appendix.

The basic issue in dealing with community and environmental noise is its effects, and the way it is perceived by most persons. (See the Effects Section, page A-6). Therefore the noise must be measured, described and then compared to guidelines, regulations, and known effects. For these purposes the decibel is used with an "A weighting" function, meaning only that the lower and higher frequencies are de-emphasized similar to human hearing, rather than having a "flat" frequency response (which the stereo industry considers standard). Unless otherwise stated all references to decibels

relative to human effects and community noise are "A-weighted" decibels, or dBA, in the usual abbreviated form. These weighted decibel values are then referred to as noise levels, or sound levels. The equipment used to measure noise levels is called a Sound Level Meter.

In spite of the tendency to describe environmental noise levels with single-number descriptors for simplicity, the most characteristic feature of the noise people experience in their urban communities is its extreme variability. So to better understand what a given noise environment is really like, more information about it is often presented by using more than one descriptor. For example, the average noise level may be accompanied by the maximum or highest noise level, and also the minimum noise level occurring during a particular time period. In some cases it is more important to know that, for example, the minimum noise level is 45 dBA and the maximum noise level is 90 dBA, than that the average noise level is 55 dBA.

There are literally dozens of different types of noise descriptors, each developed to give information on the effects of specific types of noise under certain conditions--for aircraft noise, for speech intelligibility, and for activity interference. But in recent years most governmental agencies in the U.S. have been recommending use of either L_n, L_{eq}, or L_{dn}. L_n, where n is a number in percent, refers to the noise level in dBA which is exceeded n percent of the time. For example, traffic noise may be generated along a freeway such that at 100 feet from the roadway 70 dBA is exceeded ten percent of the time (and ninety percent of the time the noise is less than 70 dBA). The L_{10} noise level for that location is then 70 dBA. The L_{50}, or median noise level, is also often used as a descriptor. The equipment for measuring statistical noise descriptors is called a Noise Distribution Analyser.

L_{eq} is the energy equivalent noise level, otherwise defined as the single steady noise level which has the same sound energy as the actual widely-varying noise level being described. L_{dn} is essentially the same as L_{eq} except that during the night time period from 10:00 p.m. to 7:00 a.m. a 10 dB "penalty" is added to account for the expectation of a more quiet environment at night. In other words, a location with a 55 dBA daytime L_{eq} would only have an L_{dn} of 55 if the noise level during the night dropped at least 10 dBA.

The ambient noise level refers to the combination of all sources of noise which make up the noise experienced at a given location. The background noise refers to the combination of distant sources which determine the minimum sound levels in any location. In statistical descriptors the L_{90} or L_{99} level is often used as a measure of the background noise level.

To more readily be able to understand and compare the differences in noise levels from one location to another, equal noise contours are often developed for a given site. Contours can be constructed for L_{10}, L_{dn}, L_1, or any other appropriate descriptor, depending upon their intended purpose. Most often, L_{10} or L_{dn} contours are used, joining locations on a site which have the same L_{10} or L_{dn} noise levels in 5 dB increments, similar to joining places of equal elevation on a topographic contour map. Noise contours are helpful and effective in land use planning and in developing noise mitigation measures.

Two concepts are particularly important in dealing with noise mitigation, noise reduction, or noise attenuation, three terms having the same meaning in general usage. Each term means to lower noise levels in the area of concern through one or more techniques. Reflection is one common noise reduction method, which diverts sound energy from a location of high impact

to an area of less impact, such as with a noise barrier. Noise absorption is a mechanism by which some materials, such as thick grass outdoors, or spun fiberglas batts (home insulation), convert incident sound energy into heat rather than reflecting it.

Mathematical noise models are often used in making analyses of noise environments as a supplement to normal field noise measurements, or for projecting future noise conditions which cannot be measured. Noise modeling refers to using previously measured and analysed relationships between noise source characteristics and physical and geometrical conditions to estimate noise levels. A number of models for projecting aircraft noise, highway vehicle noise and railroad noise have been developed by or under contract to several governmental agencies, and are presently in widespread use and acceptance.

APPENDIX

THE EFFECTS OF NOISE ON PEOPLE

Noise is a part of our modern society -- noise from motorized labor-saving devices, transportation vehicles, and recreation devices. The use or conversion of energy for any purpose is seldom accomplished silently. We as humans have a capacity to tolerate or ignore a certain amount of our noise environment. But adverse effects are present in many exposures to noise, and dangers to health other than outright hearing impairment are also recognized.

The problem of controlling noise is difficult because it affects each individual in a different way. People do not hear sounds alike, nor do they perceive sounds similarly, hence they do not react to sounds in the same way. First of all, each person's reaction to noise will depend on characteristics of the noise itself:

1. loudness or intensity
2. Frequency content
3. duration
4. repetition rate
5. time of occurrence
6. unfamiliarity or uniqueness.

But the effect of noise on people is also determined by characteristics of the listener or the situation:

7. background or ambient noise level
8. individual sensitivity to noise
9. activity or preoccupation of listener
10. perceived need or justification for noise.

A combination of factors determines how much a person will be disturbed by a noise, depending upon the individual, the noise, and the situation, but the effect will fall into one of the following categories: physiological effects, psychological/emotional effects, and activity interference.

As an orientation to the use of the decibel as a measure of relative loudness, a list of common noise sources and their approximate sound levels are given in Page A-8.

Physiological Effects

At relatively high noise levels above 80 dBA, the delicate internal ear mechanism can be altered to cause Temporary Threshold Shift (TTS), resulting in partial deafness for a period of a few minutes to a few weeks, depending upon the noise level and the exposure time. If these excessive levels over 80 dBA are continued over long periods of time -- for example, 8 hours per day for several years, or if very high levels (over 100dB) are experienced for shorter periods, Permanent Threshold Shift (PTS) may result, meaning that irreversible loss in normal hearing capacity has occurred.

Fortunately, few exposures to levels causing hearing damage occur in the general community noise environment. However, some problems may occur for those choosing to attend or participate in musical and recreational events with high sound levels, or for persons engaged in occupations involving high noise levels (Occupational noise is regulated by State and Federal Occupational Safety and Health Regulations). But the potential for other less obvious noise effects exists throughout a normal daily schedule -- at home, school, shopping center, park, or highway. These various noise impacts can cause subtle physical, mental, and emotional stresses of varying degrees of seriousness.

Activity Interference

Noise disrupts human activities such as sleep, conversation, or stereo and TV enjoyment. Studies have shown that noise not only may prevent sleep by its intensity or characteristics but may seriously disturb the quality of sleep without fully awakening the sleeper. Conditions such as these -- community noises causing bedroom levels between 35-50 dBA -- are encountered to some extent throughout all urbanized areas. At noise levels over 55 dBA all types of normal listening activities are disrupted by noise. Speech intelligibility drops sharply, music listening and TV watching become strained, and aural communications in general must be carried out at much higher volumes to be successful. Obviously, shouting to be heard and understood is both undesirable and unpleasant for all concerned.

Psychological and Emotional Impacts

Less well documented and understood, but probably more widely experienced, are those impacts of noise which cause such subtle effects as distraction, annoyance, startle, privacy or relaxation interruption, stress, and tension. These effects as a class can, if continued, cause very serious emotional and psychological anxieties and disturbances. Often the cause of these reactions is not directly related to the noise environment, as the listener is not consciously aware of the noise intrusion. He may only be aware of an increased irritability and uneasiness. Our unusual human ability to "tolerate" or "adapt to" disturbing noise levels thus can incur a penalty upon our subconscious body processes over an unusually wide range of noise levels. So protection against the intrusion of disturbing noise is particularly important to mental and emotional health in an active and complex urban community.

TYPICAL NOISE SOURCES	NOISE LEVEL (dBA)	TYPICAL HUMAN RESPONSE
Jet aircraft take off (50')	130	
Auto horn (3')	120	Pain & Hearing Damage
Rock music in a night club	110	
	105	Possible Permanent Hearing damage
Motorcycle accelerating, no muffler (25')	100	
	95	Temporary Hearing Loss
Motorcycle accelerating, stock muffler (25')	90	Uncomfortable
Food blender (3') Power lawn mower (20')	80	Very Disturbing
Steady urban traffic (25')	70	Communications Difficult
Normal conversation (3')	60	
Daytime street, no nearby traffic	50	
	45	Sleep Disturbance
Quiet office	40	
Inside quiet home. Soft whisper (10')	30	Very quiet
Movie or recording studio	20	Seldom-experienced ambient
	10	Barely audible
Threshold of hearing	0	

A decibel "A-weighted' (dBA) is a unit of measurement indicating the relative intensity of a sound as it is heard by the human ear. An increase of 10 dBA indicates a noise level increase of about three times, but only a doubling in perceived loudness.

Appendix D

Air Quality Analysis

Environmental Consulting Services

Noise
Air Quality
Energy

20430H Town Center Lane
Cupertino, CA 95014
(408) 257-1045

AIR QUALITY IMPACT AND MITIGATION STUDY

HAM LANE IMPROVEMENT PROJECT

City of Lodi, CA

August 31, 1984

Submitted to

KATE BURDICK LAND USE PLANNING

Auburn, CA

Prepared by

H. STANTON SHELLY

Principal Consultant

HAM LANE WIDENING PROJECT

AIR QUALITY SECTION

INTRODUCTION

The air quality of a given area is not only dependent upon the amount of air pollutants emitted locally or within the air basin, but also is directly related to the weather patterns of the region. The wind speed and direction, the temperature profile of the atmosphere, and the amount of humidity and sunlight determine the fate of the emitted pollutants each day, and determine the resulting concentrations of air pollutants defining the "air quality."

I. EXISTING SETTING

A. Regional Climate.

The San Joaquin Valley climate is a Mediterranean type, characterized by mild and rainy winters, and hot and nearly dry summers. There is a high percentage of sunshine, over 80% of the daylight hours from April to October.

During the summer the Pacific high pressure system typically sits near the California coast, pushing oncoming ocean-formed storm systems north through the northwest states and Canada. Subsidence of warm air aloft associated with this system creates the frequent summer atmospheric temperature inversion and stagnated conditions. (See the Appendix for definitions of commonly-used meteorological and air quality terms.) Average maximum temperatures during the summer in the Stockton - Lodi region are near 90° F., and average evening minimums are near 55° F.

During the winter the Pacific high pressure system moves southward, allowing storms to move through Central California. As they approach, winds are typically from the southeast, and as the storm passes they turn northeast. Gusting winds of 20 to 40 mph are common during storms. With the dominance of the unstable low-pressure systems during the winter, and less sunshine, conditions favoring smog formation are at a minimum. At this time of year stable atmospheric conditions produce heavy ground fog, which may cover much of the Central Valley for several days to several weeks. Average maximum winter temperatures in Lodi and Stockton are nearly 60° F., and average evening lows are about 40° F.

The north end of the San Joaquin Valley receives about 14 inches of precipitation annually. Very little rain falls in May and October, usually near half an inch, and almost none from June through September. A majority of the rainfall comes in December, January and February --- about 2.5 inches per month in normal rainfall years.

B. Ambient Air Quality

Air quality in Lodi and the San Joaquin Valley is subject to the problems experienced by many areas of California. Emissions from millions of vehicle-miles of travel each day often are not mixed and diluted, but are trapped near ground level by a temperature inversion. Pollutant concentrations are a result of local emissions in Lodi, and also the transport of pollutants from other areas such as Stockton, Sacramento, and even the Bay Area (with westerly winds). These sources produce concentrations which sometimes exceed ambient air quality limits established by the state Air Resources Board. Recent air quality data from the nearest ARB monitoring stations, Ham Lane in Lodi and Hazelton Street in Stockton, are tabulated in Exhibit 1.

Ozone, the primary oxidant "smog" component, is produced by complex reactions of hydrocarbons and NO_x in the atmosphere. Both vehicles and the use of organic chemicals produce emissions which drive the chemical reaction. Daily ozone concentrations are heavily dependent upon the weather and atmospheric stability, and thus vary substantially from year to year. Adverse atmospheric conditions in 1980 produced 78 exceedances of the 10 ppm hourly standard in Lodi, and over two dozen ozone exceedances were still recorded in 1981 and 1982.

EXHIBIT 1

AMBIENT AIR QUALITY

San Joaquin County

POLLUTANT	1980	1981	1982	Std	Meas Units
OZONE (1)					
Maximum	14	13	13	10	pphm, 1-hr ave
Exceedances	78	26	28	1	days per year
CARBON MONOXIDE (1)					
Maximum hour	10	9	12	20	ppm, 1-hr ave
Maximum 8-hour	5	4	7	9	ppm, 8-hr ave
8-hour exceedances	0	0	0	1	days per year above 9 ppm
NITROGEN DIOXIDE (2)					
Maximum	13	14	19	25	pphm, 1-hr ave
Exceedances	0	0	0	1	days per year
SULFUR DIOXIDE (2)					
Maximum	4	3	3	5	pphm, 24-hr ave
Exceedances	0	0	0	1	% of days per year
TOTAL SUSPENDED PARTICULATES (2)					
Annual Geom. Mean	85	79	66	60	ug/m^3 ave
Daily exceedances	34	22	20	2	% of days above 100 ug/m^3

Source: California Air Resources Board monitoring data for:
(1) Ham Lane station in Lodi
(2) Hazelton Street station in Stockton

Carbon monoxide, like oxidant, is also heavily dependent upon both vehicle emissions and weather. However, no exceedances of the either the 9 ppm 8-hour ambient standard or the 20 ppm 1-hour standard have been recorded recently in Lodi. Both oxidant and CO have been reduced significantly by improved emission controls on new automobiles in the past decade.

Total suspended particulates are produced by vehicles, heavy industry, and soil-moving activities such as construction and farming. In Stockton, ten miles south of the project area, the annual average (annual geometric mean) TSP concentration has been consistantly above the 60 ug/m^3 ambient standard. The daily average standard of 100 ug/m^3 was also exceeded on over 34% the days tested in 1980, and over 20% of the days in both 1981 and 1982.

Sulfur dioxide is primarily associated with chemical and refining industries, and is not a problem in San Joaquin County. The superior controls required on chemical process plants are largely responsible for this achievement. Nitrogen oxides are produced heavily by vehicles and high-temperature industrial operations, but as yet have not produced serious concentrations in the region.

II. POTENTIAL AIR QUALITY IMPACTS OF PROJECT

A. Sensitive Receptor Locations

The air quality impacts or benefits of the Ham Lane Improvement Project would be felt most directly on the properties along the improved section. A majority of the properties along the project are residential, with a church and a few commercial land uses making up the remainder. The extent of the change in local vehicle- related pollutants is evaluated in the following sections.

B. Data and Methodology

Vehicles are responsible for the emission of a number of pollutants -- hydrocarbons, particulates, NOx, and others. The most widely-used indication of vehicular emissions impact is to model concentrations of carbon monoxide (CO) at nearby sensitive receptor locations. Roadside CO concentrations are directly related to the number of vehicle trips on nearby streets, and to the average vehicle emission rate. However, average emissions decrease as average speed increases. The actual concentrations at the receptors are determined by the speed and direction of the wind, and the temperature layers in the lower atmosphere. Atmospheric conditions control the mixing, diffusion, and transport of the pollutants after they are emitted.

The model used for this study (Ref. 4) is based upon standard Gaussian line source diffusion relationships developed by Turner (Ref. 5) and others. Worst-case assumptions include very poor atmospheric conditions (wind speeds of 1 to 2 meters per second and low temperature inversion height), which occur on numerous occasions each year in the area.

Roadside concentrations of CO have been computed for both peak-hour and maximum eight-hour traffic conditions on Ham Lane, at a distance of 40 feet from the middle of the road (about the middle of the average yard). Distance is not a significant air quality factor, however, since concentrations decrease very slowly as distance increases. Composite vehicle emission factors are from the Air Resources Board EMFAC program (Ref. 6).

C. Project Traffic Impacts

The intent of the project is to improve the flow of traffic on Ham Lane by providing four traffic lanes and therefore more capacity. As higher average speeds are achieved through less- congested traffic flow, air quality emissions and impacts would be lower on Ham Lane and on neighboring streets. However, lower emissions per vehicle would be offset somewhat by anticipated increases in vehicle volumes in future years. Since no new trips are being generated by the project, the total number in the area will stay the same.

Roadside CO concentrations were modeled for two No-Project cases and two Project cases for comparison, based upon different lane configurations and traffic volumes:

Case 1 : No-Project, two lanes, 1985, ADT of 12,500.
Case 2 : Project, four lanes, 1995, ADT of 20,300.
Case 3 : Project, four lanes, 2005, ADT of 25,300.
Case 4 : No-Project, two lanes, 2005, ADT of 25,300.

Average Ham Lane speeds are estimated to be 30 mph during peak hour and 35 mph at other times for Cases 1, 2, and 3. Case 4 would be seriously congested, and speeds are estimated to be 20 mph at peak hour and 25 mph at other times. Traffic projections are from the project traffic study by TJKM Transportation Consultants, Sacramento. Exhibit 2 compares the roadside concentrations for the most significant cases. Other cases not evaluated would produce smaller changes in roadside CO concentrations.

Exhibit 2 - Ham Lane Project CO Concentrations (ppm)

CASE	PEAK HR	HIGH 8 HR.
1. No-Project, 1985	1.1	0.3
2. Project, 1995	1.3	0.4
3. Project, 2005	1.6	0.5
4. No-Project, 2005	2.0	1.0

It should be noted that the Exhibit 2 concentrations are based only upon vehicles on Ham Lane. The total CO concentration would include a variable background concentration of from 1 to 5 ppm from other vehicular emissions and sources in the area.

The modeled concentrations show the effects of the gradual increase of traffic volumes in Cases 1, 2 and 3. Case 4 concentrations are caused by congestion and low speeds with only two traffic lanes. Neither the state 20 ppm peak hour standard nor the 9 ppm eight hour standard are threatened by the Ham Lane traffic in any case. The project would be expected to reduce slightly local CO concentrations relative to a two-lane road.

D. Overall Project Impacts

Another way to evaluate the potential impact of the Ham Lane Improvement Project is to estimate the overall change in vehicular emissions produced by the project. The total emissions produced by a group of vehicles depends upon the number of trips, the trip length, and the average speed. Since the total number of trips and trip length are not changed by the project, the average speed is the only variable which affects total emissions. Based upon an estimated higher average speed (25 mph vs. 35 mph) with project implementation, total emissions on Ham Lane would be as shown in Exhibit 3.

Exhibit 3 - CHANGES IN HAM LANE VEHICLE EMISSIONS

	CO	NMHC	NOx	PART
Project Change	-28 %	-19 %	+7 %	no chg

The Exhibit 3 analysis is derived from the average emissions factors listed in Reference 6 for the different average speeds. Note that particulate emissions are not related to speed, and that as speed increases, oxides of nitrogen are slightly increased, which is opposite to CO and non-methane hydrocarbons. The CO pollutant is the most sensitive to speed, and therefore would benefit the most from the reduced congestion offered by the four lanes.

E. Potential Construction Impacts

During the grading and construction phase, dust may be produced, particularly during the dry months of the year. Particulate generation can be minimized by standard sprinkling procedures on dusty working areas at least once a day.

III. Project Mitigation Measures

This project would appear to have a net benefit to the local air quality and therefore does not require mitigation. Increasing average vehicle speed, by increasing the number of traffic lanes on congested routes, is itself an air quality mitigation measure recommended on some types of projects to offset increasing trip volumes.

AIR QUALITY REFERENCES

CLIMATOLOGY

1. Felton, E.L., California's Many Climates, Pacific Books, Palo Alto, 1965.

2. Station Climatic Summaries, U. S. Naval Weather Service Environmental Detachment, Asheville, N.C.

AIR QUALITY

3. CAlifornia Air Quality Data, Annual summaries of station air quality data, Technical Services Division, California Air Resources Board, Sacramento.

MODELING

4. Guidelines for Air Quality Impact Analysis of Projects, BAAQMD (then BAAPCD), June 1975, and updates.

5. Turner, D. Bruce, Workbook of Atmospheric Dispersion Estimates, AP-26, U.S. Environmental Protection Agency, 1970.

6. "ENVO28" computer program to determine annual composite vehicle emission rates, based upon "EMFAC 6 " vehicle-specific emission rate program, California Air Resources Board, Sacramento.

APPENDIX

COMMON AIR QUALITY TERMS AND DEFINITIONS

Air basin or **airshed** - a region which, due to its geography and topography, tends to contain air pollutants emitted within it.

Air pollutant - a substance in the atmosphere which is harmful or undesirable.

Air quality - the amount of pollutants in the air relative to existing ambient air quality standards*.

Air Resources Board (ARB) - California agency responsible for state air quality planning and control program.

Ambient Air Quality Standards - exposure limits established for various air pollutants by state and federal agencies.

Bay Area Air Quality Management District (BAAQMD) - nine-county agency responsible for air quality planning and control in the San Francisco Bay area.

Carbon monoxide (CO) - an odorless and invisible gas pollutant produced primarily by vehicle operation. Reduces oxygen-carrying capacity of the blood, causing headache, fatigue, coordination disfunction, and cardio-respiratory stress.

Concentration - the amount of a pollutant in a given volume or sample of air.

Department of Environmental Protection (NDEP) - Nevada agency responsible for state air quality planning and control programs.

Dispersion - the process of mixing, dilution, and transport of air pollutants.

Emission - discharge of a substance into the air.

Environmental Protection Agency (EPA) - federal agency with overall responsibility for national and state air quality planning and control programs.

Hydrocarbons (HC) - a large group of compounds containing hydrogen, carbon and various other elements, and found in fossil fuels, paints and solvents. They cause plant damage, odor, and contribute to smog* formation.

Inversion - a reversal of the normal temperature lapse rate* in the atmosphere, producing a stable high-temperature layer above a lower-temperature layer.

Line source - a linear group of pollutant emitters, such as vehicles on a roadway.

Microgram per cubic meter ($\mu g/m^3$) - a common unit of measurement of particulate concentration* in weight per unit volume.

Mixing layer - when an atmospheric temperature inversion* exists, the layer of air below the inversion altitude in which air pollutants are confined.

Modeling - a technique of using estimated source emissions and meteorological information to compute expected air pollutant concentrations.

Monitoring - regular measurement of air pollutant concentrations.

Nitrogen oxides (NO_x) - formed during high-temperature combustion processes, several gaseous pollutants cause plant damage, eye and lung irritation, and discoloration of materials. Nitrogen dioxide causes the typical brown color of smog.*

Odor - can be aesthetically unpleasant, and cause illness in some cases. Common problem gases include hydrogen sulfide, ammonia, and some organic vapors.

*defined elsewhere

Organic compounds - a very large group of substances containing carbon, found in all living matter, and also fossil material such as coal and petroleum. They are often released when extracted, processed, and/or burned.

Oxidants - a highly-active group of chemicals (mostly ozone in air) formed in the atmosphere by the photochemical reaction* of hydrocarbons*, nitrogen oxides*, and sunlight. Causes extensive vegetation damage, eye irritation, headache, and impaired breathing.

Ozone (O_3) - see Oxidants above.

Particulates, total suspended (TSP) - include solid particles, dust, and smoke, and are produced by industrial processes, combustion, and vehicles. They damage plants and materials, reduce sunlight and visibility, and carry irritating chemicals into the respiratory system.

Parts per million (ppm) - a common unit of measurement of gaseous pollutant concentration in relative volume of pollutant per million volumes of air.

Photochemical reaction - the atmospheric combination of hydrocarbons* and oxides of nitrogen to form oxidants* and smog*, driven by the energy from intense sunlight.

Point source - a single stationary souce of air pollution.

Primary air quality standards - recommended limits to air pollutant concentrations based upon criteria for protection of human health.

Secondary air quality standards - recommended limits to air pollutant concentrations based upon criteria for protection of property and aesthetics.

Smog - the combination of air pollutants found during intense photochemical reaction.*

Source - a process, activity, or machine which emits air pollution.

Stagnation - an extremely stable atmospheric condition in which little vertical or horizontal dispersion* of emitted pollutants occurs.

Sulfur oxides - are produced by processing and combustion of fossil fuels which have sulfur content. These gaseous pollutants are toxic to plants, deteriorate materials, and in combination with particulates, contribute to serious respiratory illness.

Temperature lapse rate - the normal atmospheric temperature profile which decreases as altitude increases. See Inversion*.

Transport - the movement of emitted pollutants by wind or thermal action.

Visibility reduction - is caused by suspended very small particles, water vapor, smoke, and gases with color.

*defined elsewhere

Draft
Environmental Impact Report

Ham Lane Improvement Plan

Prepared for City of Lodi

September 1984

Kate Burdick Land Use & Planning Consultant

CITY OF LODI

CITY HALL, 221 WEST PINE STREET
POST OFFICE BOX 320
LODI, CALIFORNIA 95241
(209) 334-5634

October 18, 1984

Dear Interested Party

SUBJECT: Ham Lane Improvement Project
Lodi Avenue to Elm Street

Attached is the Draft Environmental Impact Report for the Ham Lane project.

The City Council has set a public hearing for 7:30 P.M., November 7, 1984, to hear comments on the adequacy of the EIR. They will not discuss the desirability of the project or its alternatives, nor make any decisions on the project at this meeting. Based on comments received at the meeting, and any others submitted during the review period, City staff will prepare responses and the Final EIR. Written comments will be received up through November 21, 1984, for inclusion in the Final EIR. A second hearing will be held to discuss the Final and make a decision on the project. The tentative date for this hearing is December 5, 1984.

If you have any questions about the EIR or the project in general, feel free to call Richard Prima at 333-6706.

Sincerely

Jack L. Ronsko
Public Works Director

JLR/RCP/eeh

DRAFT

FOCUSED ENVIRONMENTAL IMPACT REPORT

HAM LANE IMPROVEMENT PROJECT

Prepared for

CITY OF LODI

September 1984

Prepared by

KATE BURDICK

1545 Shirland Tract, Auburn, CA 95603

Table of Contents

LIST OF FIGURES

LIST OF TABLES

Introduction

This Environmental Impact Report (EIR) addresses the potential environmental effects of the City of Lodi's proposed street widening Improvement Project on Ham Lane. The project calls for widening four blocks of Ham Lane between Lodi Avenue and Elm Street from an existing two-lane road to a four-lane road. Other improvements such as replacement of curbs, gutters, sidewalks and drainage improvements also are planned as a part of this project. A full description of the project is presented in the Project Description section of this report.

The project was initially proposed in 1978 and an Environmental Impact Report was completed in May 1978. While that EIR contains useful information, conditions have changed enough to warrant revision of the previously prepared EIR. Therefore, this document is a Focused EIR which addresses only those issues determined by the City of Lodi to require revision since the time the last EIR was prepared. The issues evaluated in this report include loss of street trees, traffic, noise, air quality, land use and neighborhood character and construction related impacts. In addition, a range of project alternatives are fully discussed. A summary of the identified project impacts is presented in the following section, Summary of Environmental Impacts.

Because the proposed project is considered controversial by affected citizens, several attempts have been made to solicit citizen input early in the review process so that all concerns could be incorporated into this report. A letter was sent by the City of Lodi to all owners and residents within the Ham Lane Improvement Project area informing them of the EIR process and of an informal meeting held for citizens to express their concerns. Those unable to attend the meeting were encouraged to write or call the City or this consultant with any concerns. About 32 people attended the informational meeting held August 23 and some calls and a letter have been received to date. Public comment also can be made during the review period for this Draft EIR, and at a public hearing before the City Council.

This EIR has been prepared for the City of Lodi in accordance with City requirements and the State CEQA (California Environmental Quality Act) Guidelines. As stated in these guidelines, an EIR is an "infomational document" with the intended purpose to: "inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects and describe reasonable alternatives to the project." Althouugh the EIR does not control the City's ultimate decision on the project, the City must consider the information in the EIR and respond to each significant effect identified in the EIR. As defined in the CEQA Guidelines, "significant effect on the environment means:

> . . . a substantial or potentially substantial adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise and

objects of historic or aesthetic significance. An economic or social change by itself shall not be considered in determining whether the physical change is significant.

HOW TO USE THIS REPORT

This report is divided into six sections: Summary of Environmental Effects, Project Description, Environmental Setting, Impacts and Mitigations, Environmental Evaluation, Persons Contacted and the Appendices. Each of these sections has its own purpose and serves to aid the reader in fully understanding the project and its implications. A brief description of each section follows:

Summary of Environmental Effects

This section serves to list all of the potential impacts of the project. Any mitigations which will reduce or eliminate project impacts are also presented. The level of significance with and without mitigation is identified. This section is an overview for use during discussion of the project and does not include any discussion. Use of the summary only, without reading the supporting text, could lead to an incomplete understanding of the project.

Project Description

This section presents a full description of the proposed project.

Environmental Settings, Impacts and Mitigations

This section is based on studies prepared by expert subcontractors or members of the staff. This section serves to describe existing conditions, identify potential impacts of the project and present mitigations to minimize identified impacts. The text is based on technical reports which are contained at the back of the report in the Appendices. Anyone interested in the actual methods of evaluation should refer to the Appendices while people interested in the results of the evaluation will find the information in this part of the report.

Environmental Evaluation

This portion of the report is required by state law (CEQA). These sections are used to identify, for decision makers and the general public, the unavoidable effects of the project, the potential for growth inducement and any alternative design options which will achieve the same general goals.

Persons Contacted

This is a list of all the people who were contacted, either in person or by telephone, in the course of the report preparation. The subcontractors who prepared technical reports are also listed.

Appendices

Technical reports prepared by specialists are included in their entirety and address traffic, air quality, noise and biologic issues.

Summary of Environmental Effects

Summary of Environmental Impacts

EXISTING CONDITIONS

The project under consideration is widening of Ham Lane between Lodi Avenue and Elm Street within the City of Lodi. The project would expand this street from two lanes to four lanes with associated road improvements. A full description of the proposed improvements is presented in the Project Description section of this report.

The following list itemizes all impacts, both significant and insignificant, that were identified during the course of this environmental analysis. The level of significance of each impact is presented, both with and without suggested mitigation measures. The mitigated impact implies that all mitigations should be followed, unless otherwise indicated in this Summary. Adverse impacts that are unavoidable and which cannot be mitigated to a level of insignificance are noted. Because no Initial Study was prepared on the project due to the fact that a previous EIR had been prepared, the City prepared a Scope of Work which detailed areas of investigation. All effects that were deemed potentially significant have been evaluated in this report.

This Summary should be used in conjunction with a thorough reading of the report. The Summary is intended as an overview; the report serves as the basis for this Summary.

Project Impact	Mitigated Impact	
		PLANTS
S	M	-- Loss of street trees and landscaping.

Mitigation

1) Retain existing trees within the undeveloped right-of-way.

2) Replace removed trees and shrubs with species of similar type and nuumber. Prepare landscaping plan to identify the type, number, location, spacing and maintenance of trees to be replanted.

S=Significant. M=Moderate. I=Insignificant. B=Beneficial.

OR

3) Redesign project according to proposed Alternative B.

Project Impact	Mitigated Impact	
I	I	-- Slight potential for root disturbance of existing trees due to project construction.

Mitigation

4) Exercise caution during sidewalk construction to minimize potential root disturbance whenever possible.

TRAFFIC

Project Impact	Mitigated Impact	
B	B	-- Decrease in existing and long-range traffic congestion.

Mitigation

5) None required.

Project Impact	Mitigated Impact	
M	M	-- Decrease in pedestrian safety.

Mitigation

6) Provide additional pedestrian safety devices (crosswalks, roadway warning signs, traffic guards, traffic or pedestrian signals).

Project Impact	Mitigated Impact	
M	I	-- Potential delays to cross traffic.

Mitigation

7) Install traffic lights as signal warrants are met.

Project Impact	Mitigated Impact	
M	M-I	-- Potential for increased vehicle speeds.

Mitigation

8) Install speed limit signs, increase enforcement, lower speed limits.

Project Impact	Mitigated Impact	
M	M-I	-- Decreased on-street parking.

Mitigation

9) Provide that all future developments have adequate off-street parking.

NOISE

S S -- Increase in vehicular noise.

Mitigation

10) Install sealed windows across house frontages wherever feasible.

11) Reduce vehicle speed.

12) Encourage carpools, bicycle use and mass transit to reduce vehicle volumes.

13) Enforce vehicle codes concerning faulty or modified exhaust systems.

14) Implement an alternative which reduces the distance between affected properties and travel lanes.

S M -- Short-term increase in construction related vehicle noise.

Mitigation

15) Require the contractor to utilize construction equipment of quiet design that is well-maintained wherever feasible.

16) Require the installation of superior mufflers and engine enclosure panels on construction equipment where feasible.

17) Restrict equipment usage to 7:30 A.M. to 5:30 P.M.

AIR QUALITY

B B -- Incremental decrease in local emission concentrations.

Mitigation

18) None required.

M I -- Temporary construction-related increase in dust.

Mitigation

19) Use water sprinkling applications daily on dusty working areas.

LAND USE

S M -- Change in the perceived neighborhood character.

Mitigation

20) Follow landscaping Mitigation #1-3.

21) Provide crosswalks and traffic signals to minimize traffic safety hazards.

22) Insure that proper visibility from resident driveways is maintained when street trees are replanted.

23) Consider installation of automatic garage door openers where necessary to provide safe resident access.

24) Follow noise mitigation #10-14.

25) Where appropriate, consider provision of fencing or lattice to provide a sense of resident privacy (may require zoning variances).

CONSTRUCTION IMPACTS

M M -- Local traffic disruption and loss of parking during construction.

Mitigation

26) Plan detour routes for minimal neighborhood disruption.

27) Notify emergency services of street closures.

28) Plan construction around peak traffic times.

S M -- Temporary increase in noise.

Mitigation

29) Follow mitigation #15-17.

M	I	--	Temporary decrease in air quality.

<u>Mitigation</u>

30) Follow mitigation #19.

M	I	--	Temporary disruption of local businesses.

<u>Mitigation</u>

31) Schedule construction to be completed as soon as possible in front of area businesses.

I	I	--	Potential disruption of subsurface utilities.

<u>Mitigation</u>

32) Plan construction to avoid underground utilities.

Project Description

PROJECT LOCATION

The project site is located in the western side of the City of Lodi, in San Joaquin County, approximately 7 miles east of Highway 5 and 1 mile north of Highway 12. Ham Lane is a major north-south arterial in the City and intersects Highway 12 at the first signalized intersection at the City's western entrance on Highway 12.

Ham Lane extends from above Turner Road on the north approximately three miles to Harney Lane on the south. Except for the area of the project site, Ham Lane is a four-lane, two-directional street, with stop signs and signals at key intersections.

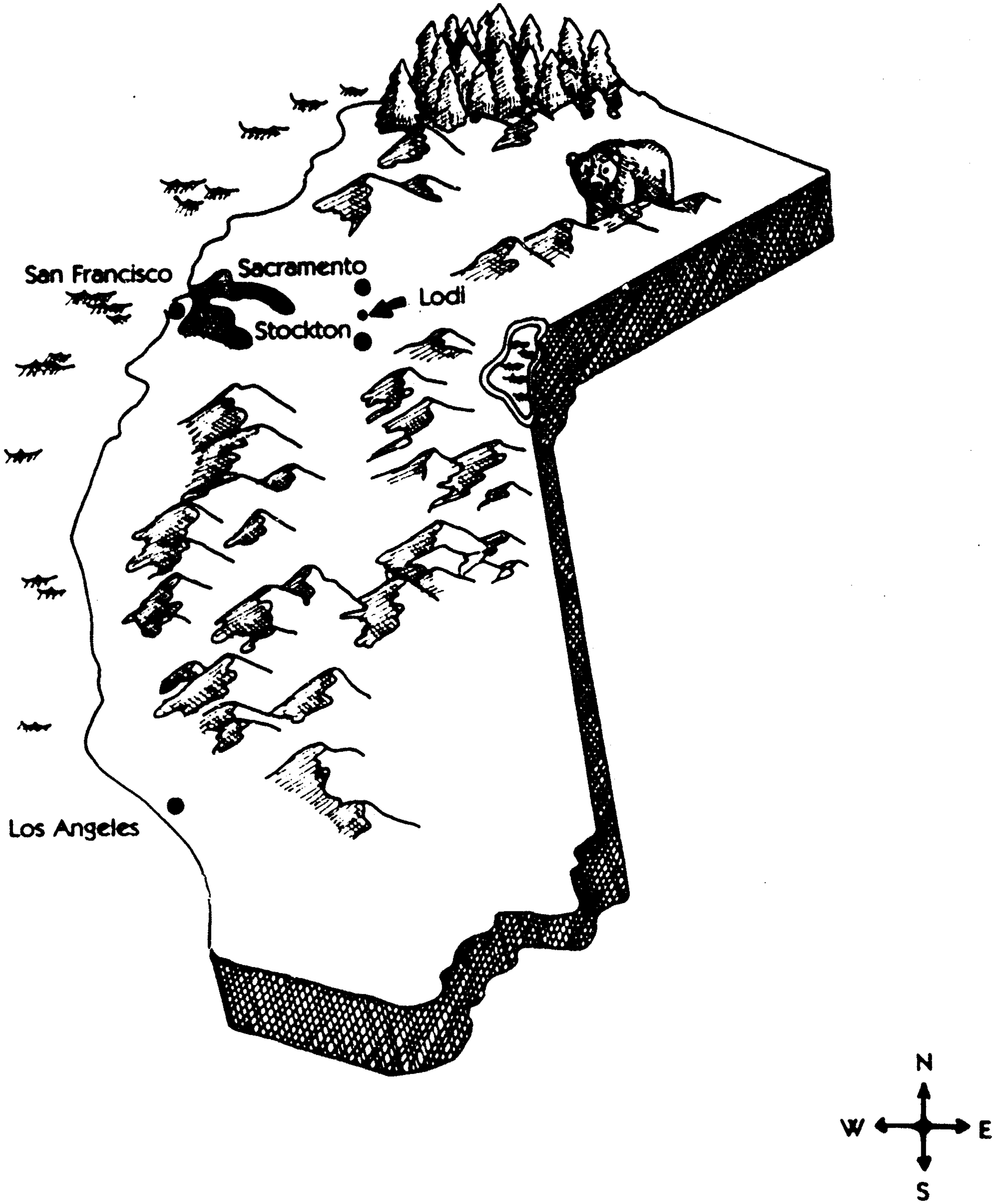
The project site comprises a four-block segment of Ham Lane between Lodi Avenue on the south and Elm Street on the north (see Figure 2). This section of Ham Lane consist of two lanes, the only existing two-lane section of Ham Lane except for the extreme north end within Lakewood Subdivision. This portion of the street has 50-, 65- to 80-foot wide right-of-way (R/W) with a section of 80-foot R/W at Lodi Avenue. The current developed roadway ranges in width from 44 to 50 feet. The narrowest portion of the project area is between Lodi Avenue and Walnut Street. (See Project Characteristics below for further details on existing and proposed improvements.)

The project site is located within an urbanized section of the City. Residential use is predominant along the project segment of Ham Lane, dominated by single-family houses. Office and public uses are predominant among the residential uses along Ham Lane south of the project section. Commercial uses are found on Ham Lane between Elm Street and Lockeford Street. (See land use section of this report for further details regarding surrounding land uses.) The project segment of Ham Lane also is characterized by large, tall trees which line the street and are described in the Plants section of this report.

PROJECT CHARACTERISTICS

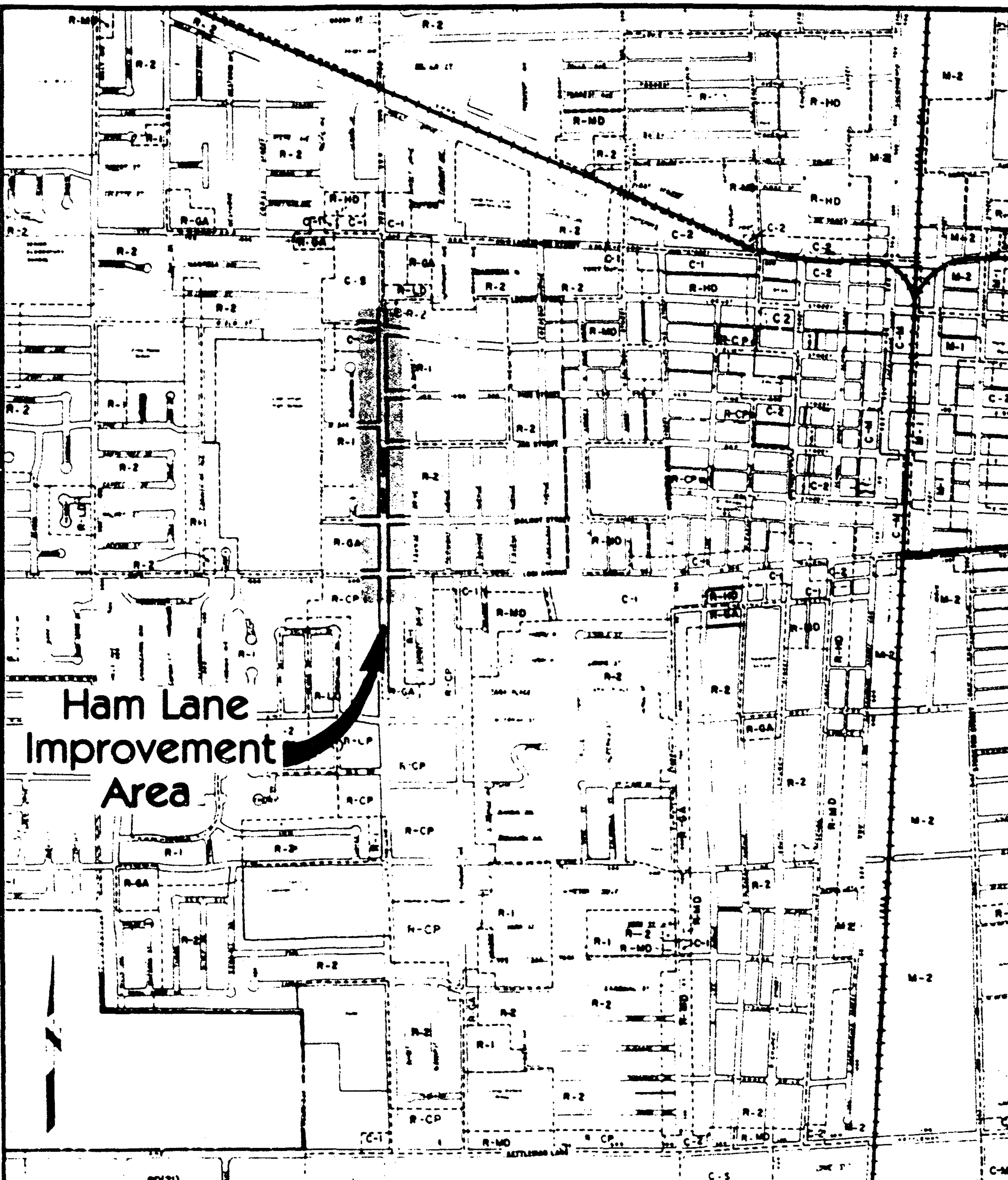
Project Objectives

The purpose of the project is to alleviate existing and projected traffic congestion and improve traffic flow along the four-block project section of Ham Lane. Ham Lane is an arterial road which facilitates major north-south traffic flow through the City, for residents, visitors and business use. Ham Lane is considered a major arterial and vital link in the City's transportation/circulation system (CH2M Hill, 1978). The proposed improvement plans are consistent with the City's current Five-Year Capital Improvement Program. The project will meet projected traffic demands to the year 2005 and beyond at a Level of Service A. Existing traffic volumes along the project



Area map

Figure 1



Vicinity map

Figure 2

segment of Ham Lane range from 12,400 to 14,100 vehicles per day. (See traffic section of this report for further details of existing and future traffic projections.)

Project History

Ham Lane originally existed as a 50 foot county road from Lodi Avenue (Sargent Road) to Turner Road (county road). The first major residential subdivision in the project area was the Hutchins Homestead Addition #3 in 1938. Prior to the next major subdivision in 1950 (Fairmont Park, east side of Ham Lane, south of Elm), the City determined that the R/W width of Ham Lane should be 80 feet. Thus Fairmont Park and subsequent developments have dedicated an additional 15 feet on each side of Ham Lane. However, developers were not required to physically widen the existing street. This explains why the street is not centered in the right-of-way and why widening could occur over most of the project without the acquisition of additional right-of-way. The proposed project was presented before the City in 1978 but was rejected at that time due to public opposition.

Project Improvements

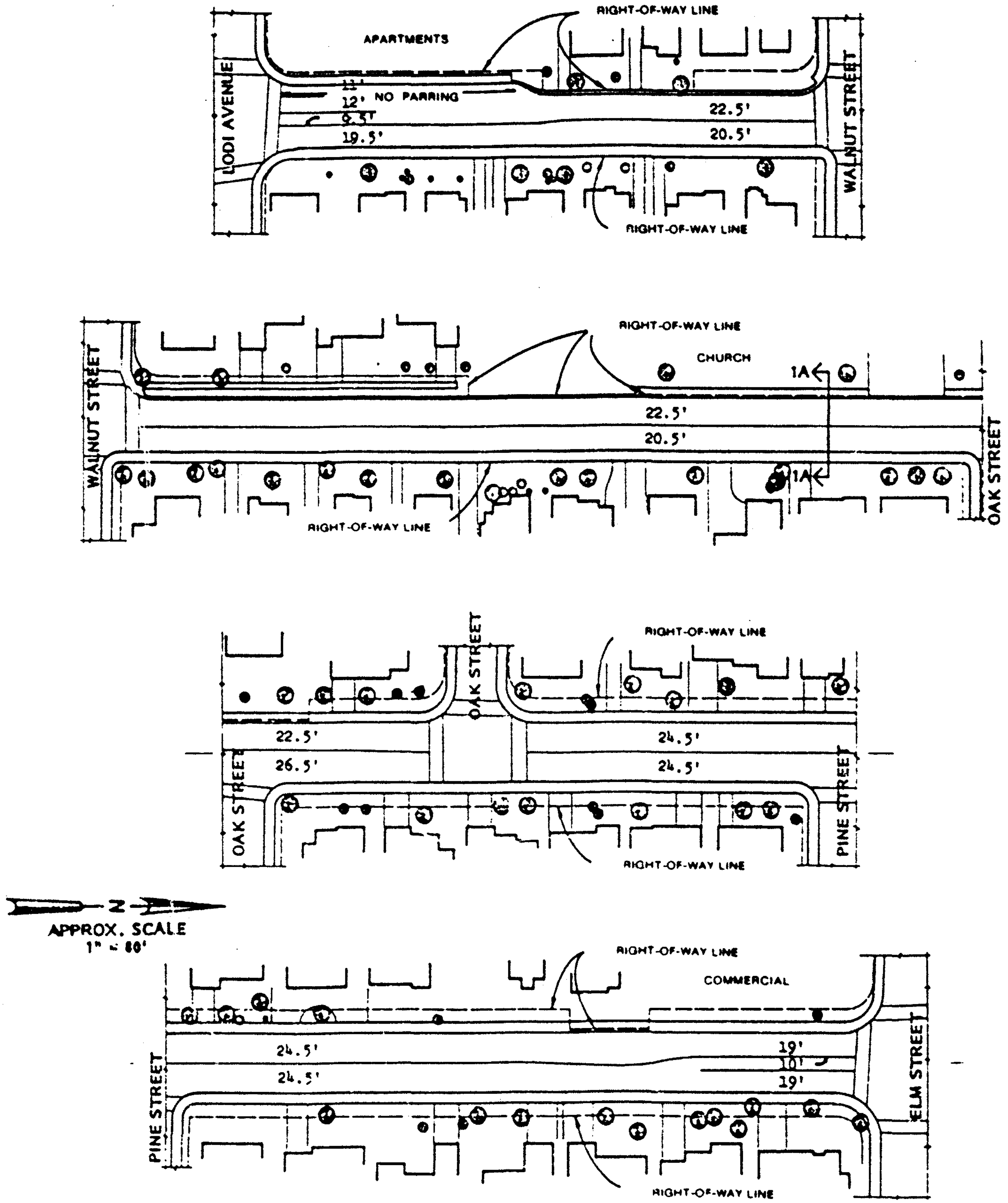
The proposed project will result in an 80-foot wide right-of-way along the project section of Ham Lane, with a developed 64-foot wide roadway. The existing curb-to-curb street width in this section of Ham Lane ranges between 44 and 50 feet. This portion of Ham Lane is currently striped for two traffic lanes and has crosswalks that are marked at the intersections. Figure 3 illustrates the existing Ham Lane roadway. An eight-phase traffic signal controls the Lodi Avenue and Ham Lane intersection and a four-phase traffic signal controls the Elm Street and Ham Lane intersection. Curbside parallel parking is allowed along both sides of Ham Lane between Lodi and Elm. The current on-street parking capacity is approximately 135 spaces (Clark, 1984).

Ham Lane, north and south of the project segment, has a curb-to-curb street width of 61.5 and 64 feet, respectively, and is striped for four traffic lanes and on-street parking, with left turn lanes and no parking at intersections.

The proposed project will result in four 12-foot wide traffic lanes and a combination of left-turn pocket lanes and on-street parking. Right-of-way easements will be acquired by the City as necessary. As part of the project, curbs and a 5-foot sidewalk on each side of the street will be constructed. Storm drains will be upgraded, fire hydrants and utility lines relocated, driveways reconstructed and pavements restriped. Project improvements are illustrated on Figures 3-1 through 3-5. A typical street cross-section is presented in Figure 4.

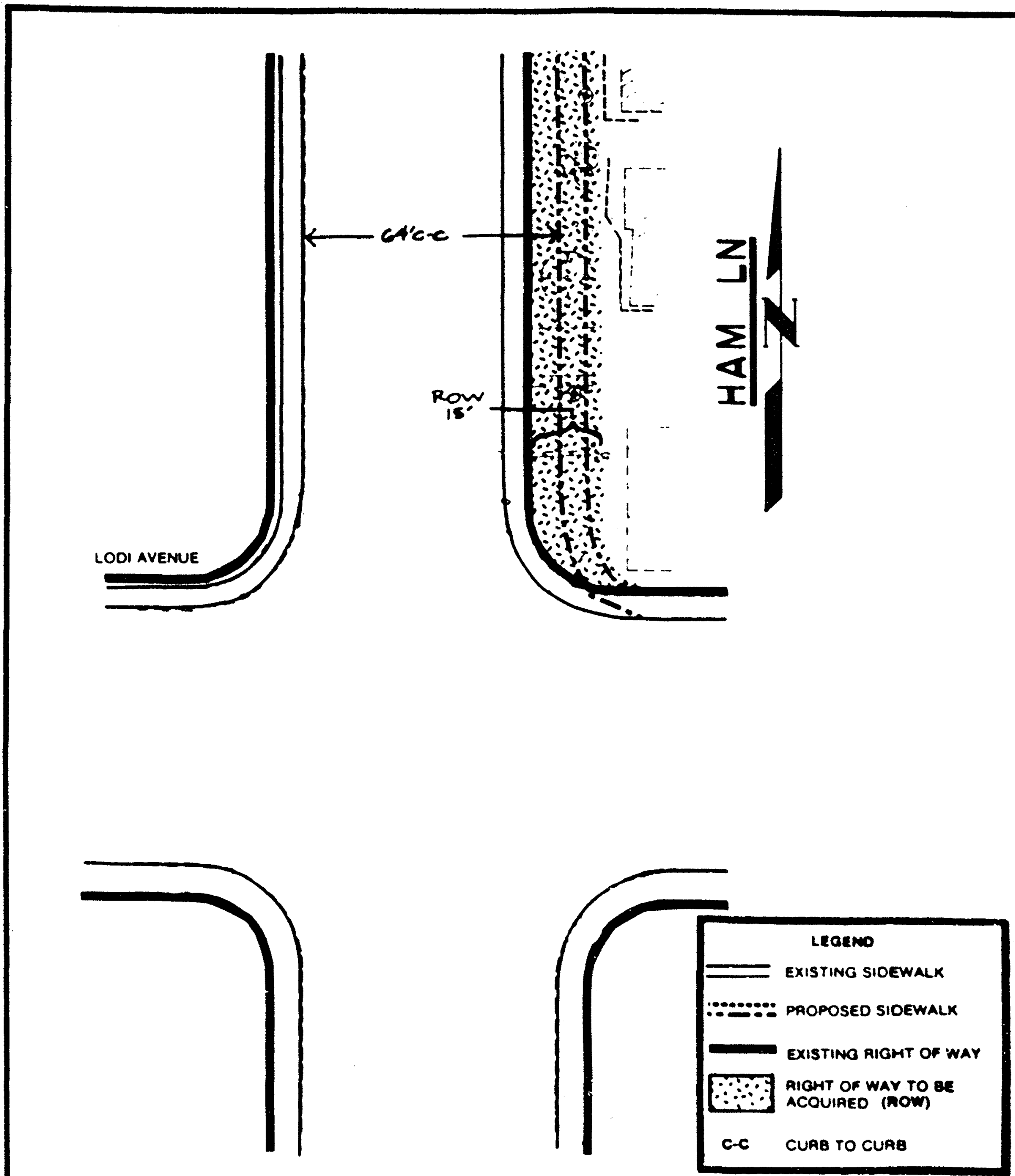
PERMIT REQUIREMENTS

As the lead agency, the City of Lodi is responsible for approving or disapproving the proposed project. The project is a City street and will not require permit approval from agencies other than the standard City department review. Relocation of utility lines will require approval by the pertinent utility companies (i.e., P.G. & E., Pacific Bell Telephone) according to their requirements.



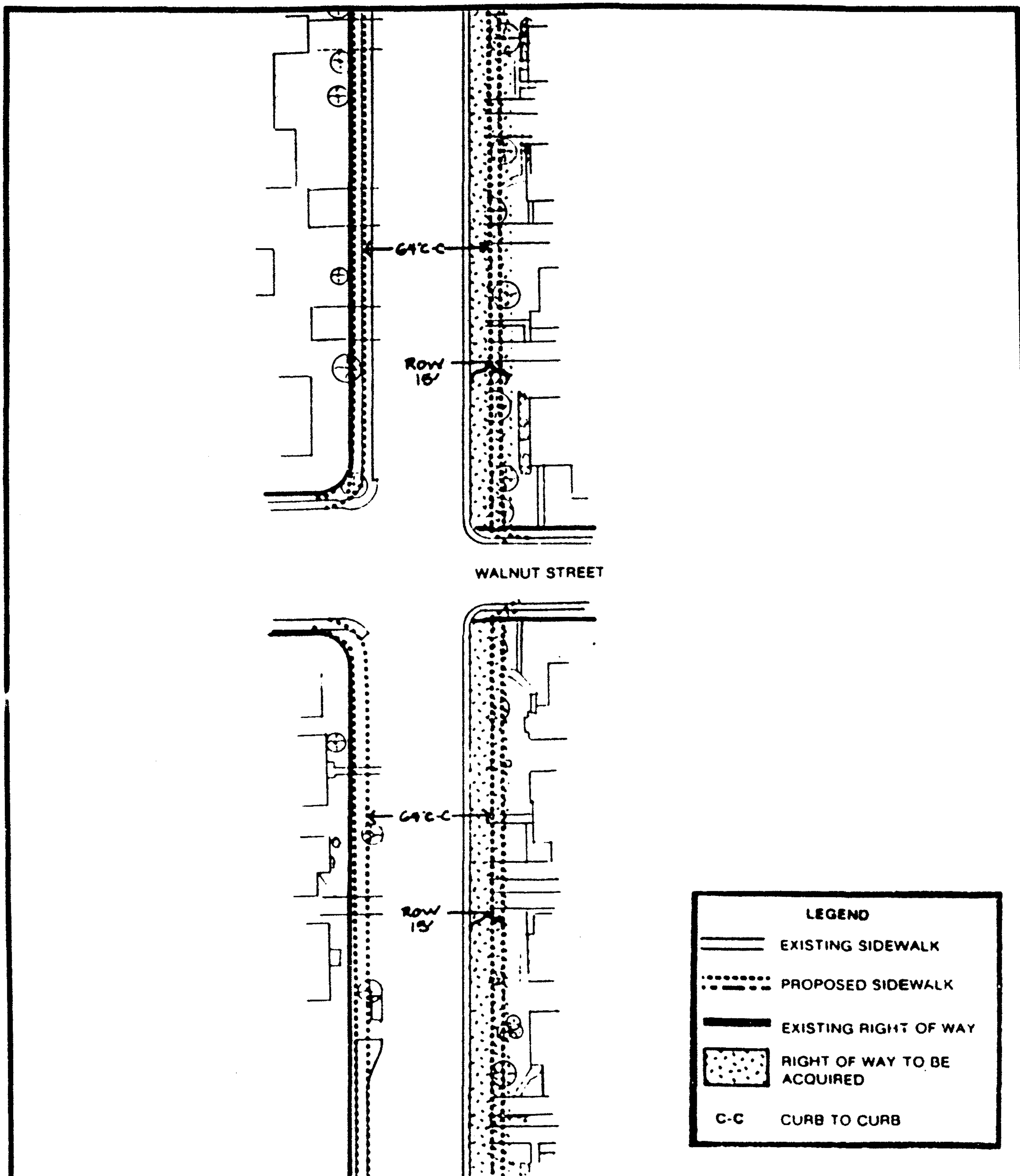
Existing Roadway

Figure 3



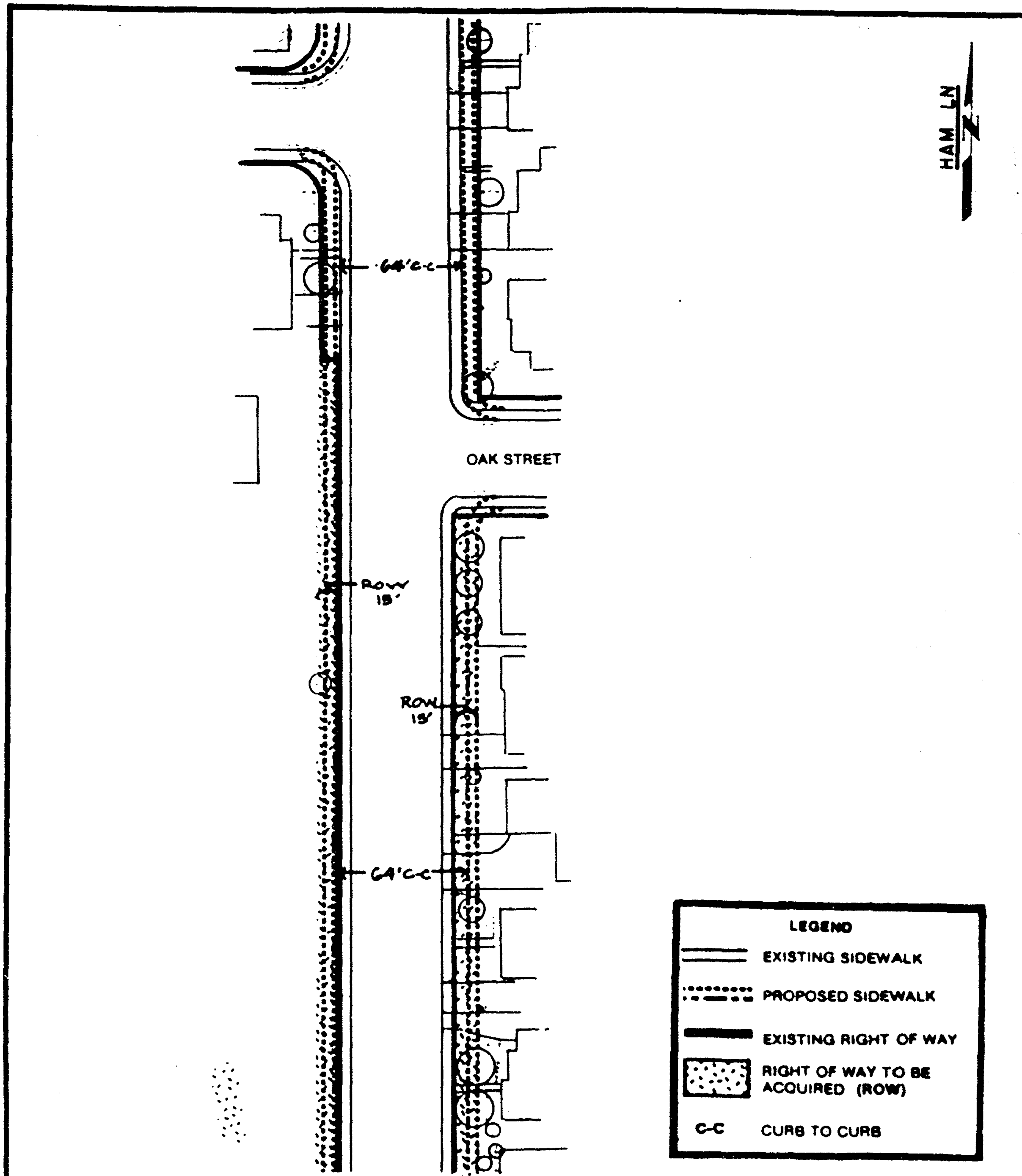
Ham Lane Improvement Plan

Figure 3-1



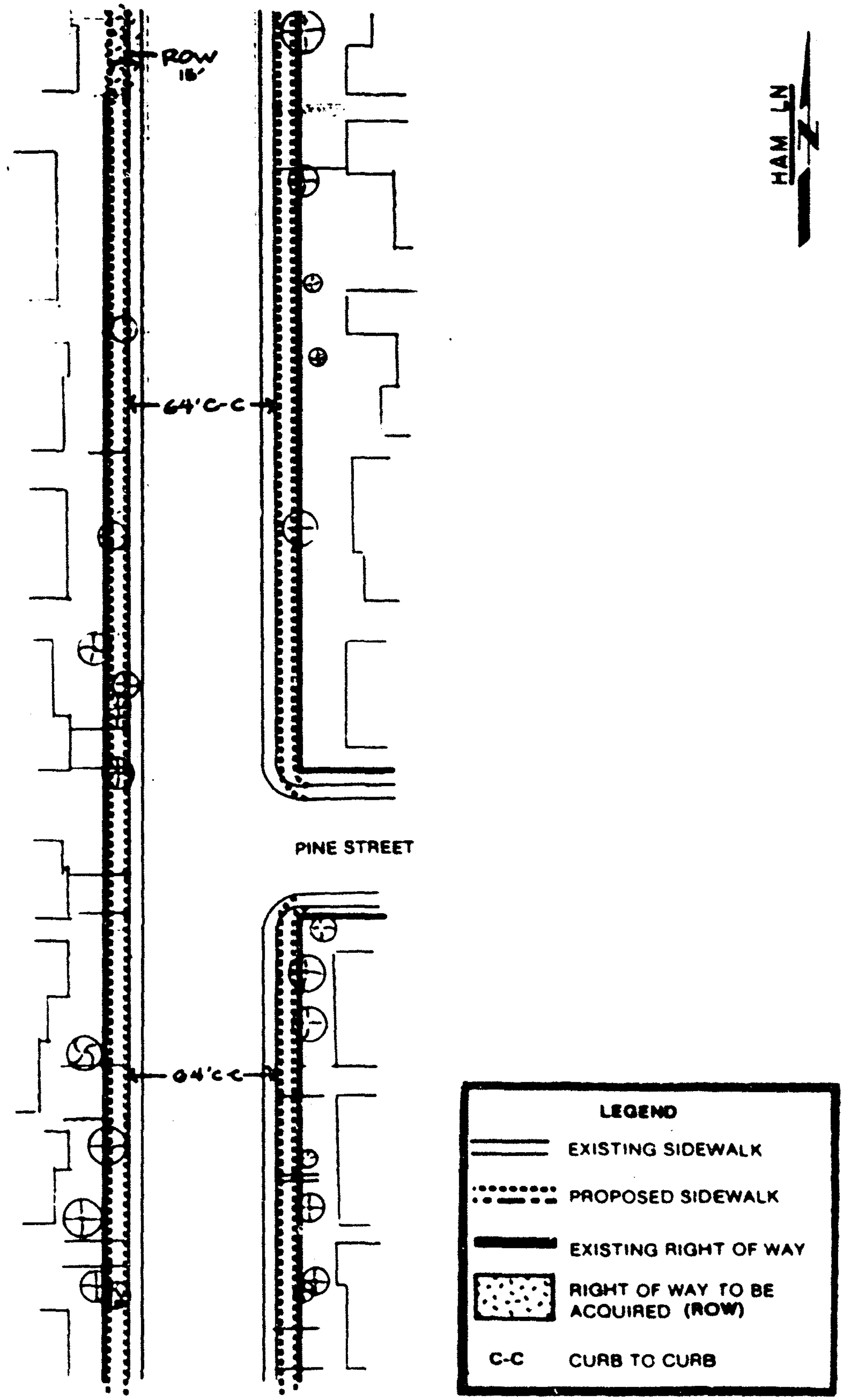
Ham Lane Improvement Plan

Figure 3-2



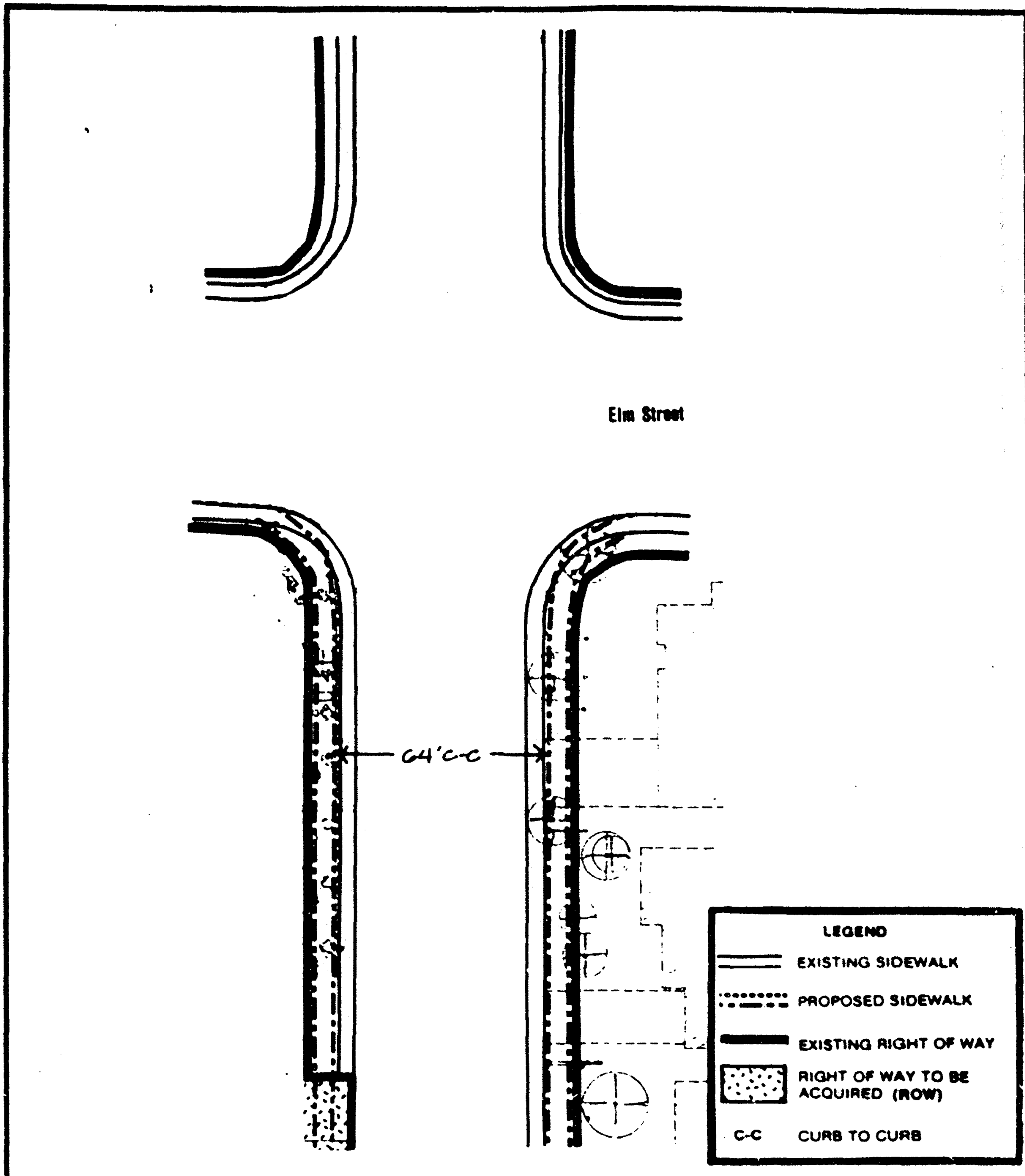
Ham Lane Improvement Plan

Figure 3-3



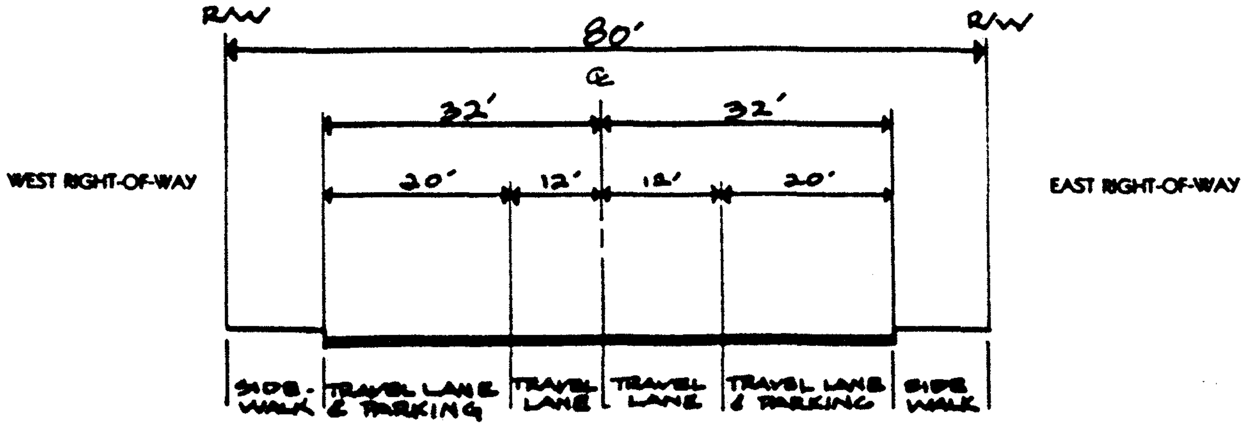
Ham Lane Improvement Plan

Figure 3-4

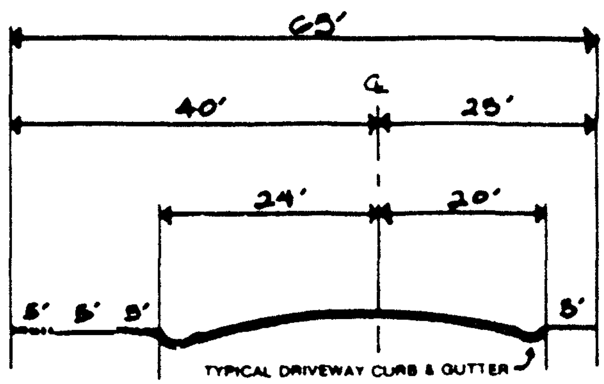


Ham Lane Improvement Plan

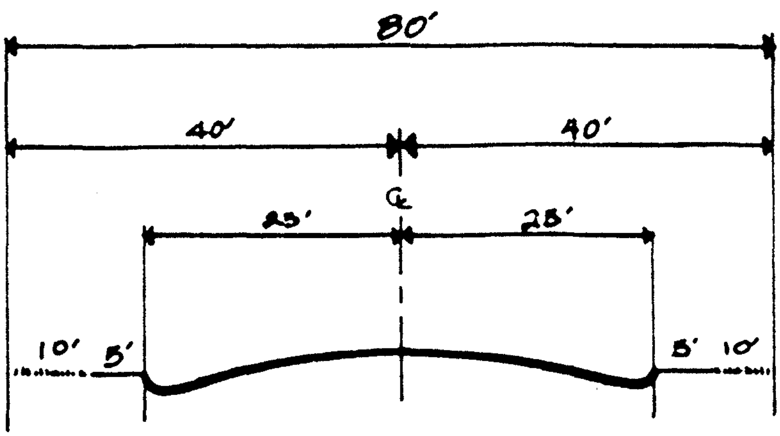
Figure 3-5



80' RIGHT-OF-WAY, 64' STREET



WALNUT



PINE

NOTE: ℄ IS A SECTION LINE AND NOT NECESSARILY THE CENTER LINE OF EXISTING ROADWAY.

Ham Lane Section PROPOSED & EXISTING

Typical Mid Block

Figure 4

Environmental Setting, Impacts and Mitigations

EXISTING CONDITIONS

The project segment of Ham Lane is primarily in single-family residential use. An apartment building, nursery, church and veterinary hospital are also found in the project area. Landscaping typically found in developed residential areas is found along this portion of Ham Lane. There are no threatened or endangered plant or animal species found in this area.

The project section of Ham Lane is one of the older residential areas of the City. As would be expected, there are numerous large, mature trees, as well as smaller trees, shrubs, lawns and typical residential landscaping planted in the front yards of the existing homes. It is estimated that there are nearly 100 mature evergreen and deciduous trees found in this area. There is no single dominant species, but a combination of ash, maple, birch, cedar, spruce, juniper and pine are found. Location of existing trees is shown in Figure 5. Project plans call for the removal of all trees and landscaping within the proposed 80-foot wide right-of-way.

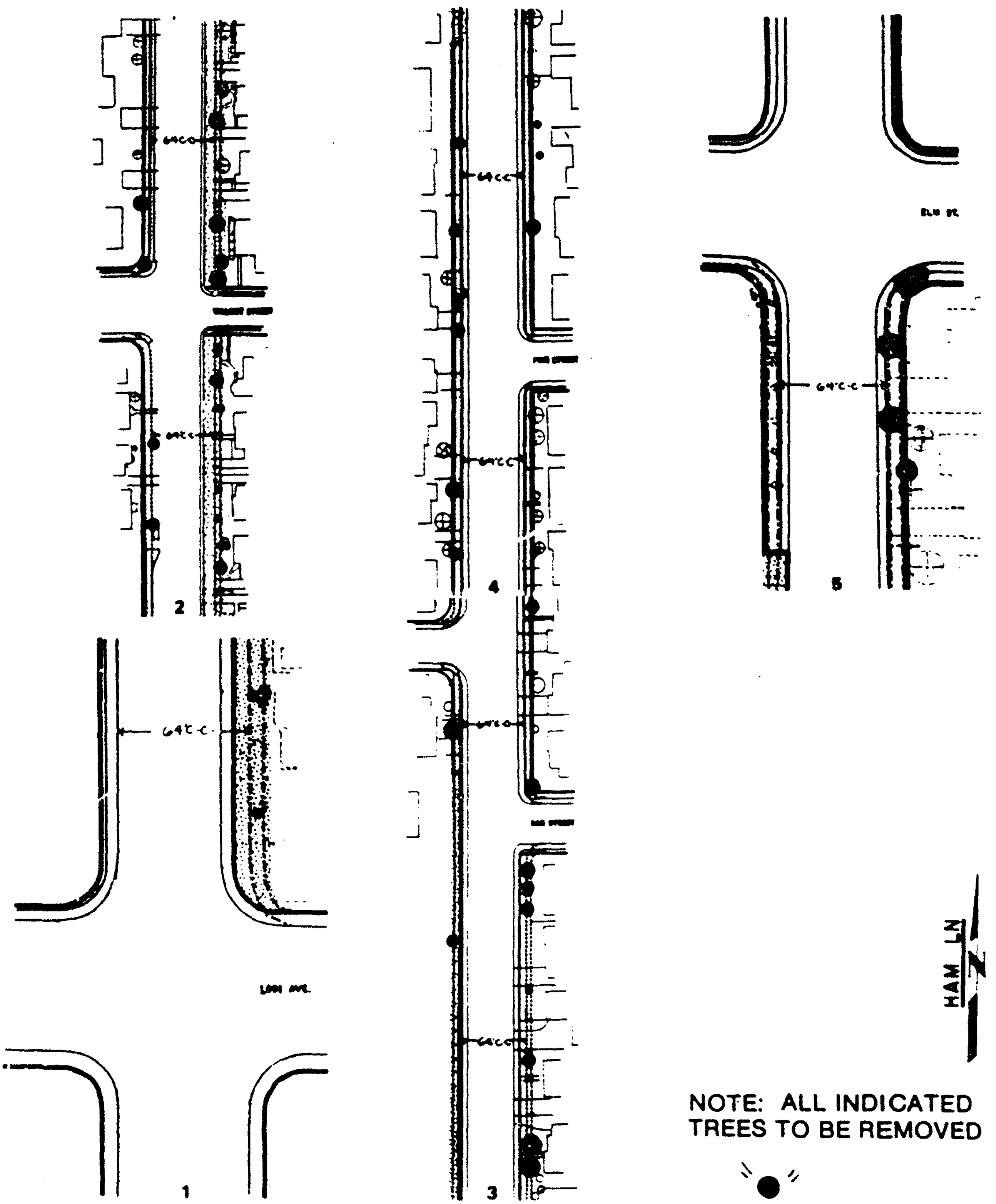
The issue of concern in this section is the loss of street trees due to the widening of Ham Lane. The presence of these mature, large trees serve several functions. They establish a residential character of the neighborhood and a pleasant visual quality to the street. They also provide shade and enhance a sense of privacy to existing residences. Wildlife is not an issue in this EIR because the project is located within an urbanized area.

IMPACTS AND MITIGATION MEASURES

Impact: Loss of street trees and landscaping.

Approximately 30 mature trees, 20 immature trees and various shrubs and landscaping would be lost due to project implementation. This would result in a change in visual and neighborhood quality of the project area, as well as a loss of shade, with potential increases in summer temperatures to area residences.

A field survey was conducted as part of this report to determine the number and type of trees that will be removed. This report is contained in Appendix A, and identifies the species that will be removed on each side of Ham Lane for each block. More major trees will be removed on the east side of Ham Lane than on the west. Approximately 20 mature trees will be removed on the east side of Ham Lane compared to about 10 mature trees that will be lost on the west side. About 20 younger, smaller trees will be removed on the east side and 32 on the west side. The majority of immature trees and shrubs to be removed on the west side are those adjacent to the existing nursery. In addition, approximately 10 feet of lawn and landscaping will be lost as a result of the roadway widening.



Tree Removal Area
Proposed Project

Figure 5

Mitigations

1. Where feasible, retain existing trees within the 80-foot right-of-way, but outside the 75-foot developed area. Where mature trees stand on or just within the developed right-of-way, adjust the sidewalk alignment to accommodate saving the tree. It is estimated that sidewalk readjustment could save approximately 15 trees. This could also entail additional R/W acquisition.

2. Replant Ham Lane with the same or similar number and type of species as those removed. In order to maintain the character of the neighborhood as provided by the existing landscaping, it is suggested that a landscaping plan be prepared to insure that the number, type, location and spacing of trees is consistent with current plantings wherever possible.

   Appendix A presents a list of recommended tree and shrub species that could be used for planting. This list will affect the ultimate landscaping plan. It is suggested the Raywood or Moraine Ash be substituted for Modesto Ash, as they are more disease-resistant (Olive, 1984). Replanting could occur in box planters, but space considerations may limit the size of trees that can be replanted due to the limited space available for root growth. It is suggested that large trees (50 to 70 feet tall) be planted 15 to 20 feet away from a dwelling, and that medium trees (35 to 50 feet tall) be planted 10 to 15 feet away from a dwelling. Medium size trees planted close to the sidewalk could be planted in deep-well containers to force the roots down. Immature trees and shrubs within the developed right-of-way should be transplanted within the undeveloped right-of-way whenever possible.

   OR

3. Redesign project according to Alternative B as discussed in the Alternatives section of this report. This would serve to retain most trees on the east side of the street because the developed roadway would be 56 feet wide, with a 72-foot right-of-way.

Impact: Slight potential for root disturbance of existing trees due to project construction.

As a result of sidewalk construction, there is a slight potential for root disturbance to trees that are not removed. However, while there may be some root damage, it does not appear that this will be significant due to the location and type of trees involved. Typically, 4.5 feet from the sidewalk to the tree trunk is a safe distance to prevent root damage (Olive, Personal Communication, 1984). It is estimated that sidewalk construction will cause excavation to about 12 inches, depending on existing ground elevation.

Mitigation

4. Exercise caution during sidewalk construction to minimize potential root disturbance whenever possible.

EXISTING CONDITIONS

Ham Lane is one of the major north-south streets serving the City of Lodi. Ham Lane terminates at Turner Road at its north end and at Harney Lane at its south end. The proposed improvement project would affect a four-block segment of Ham Lane ~~in the~~ between Lodi ~~to Oak block~~ and Elm.

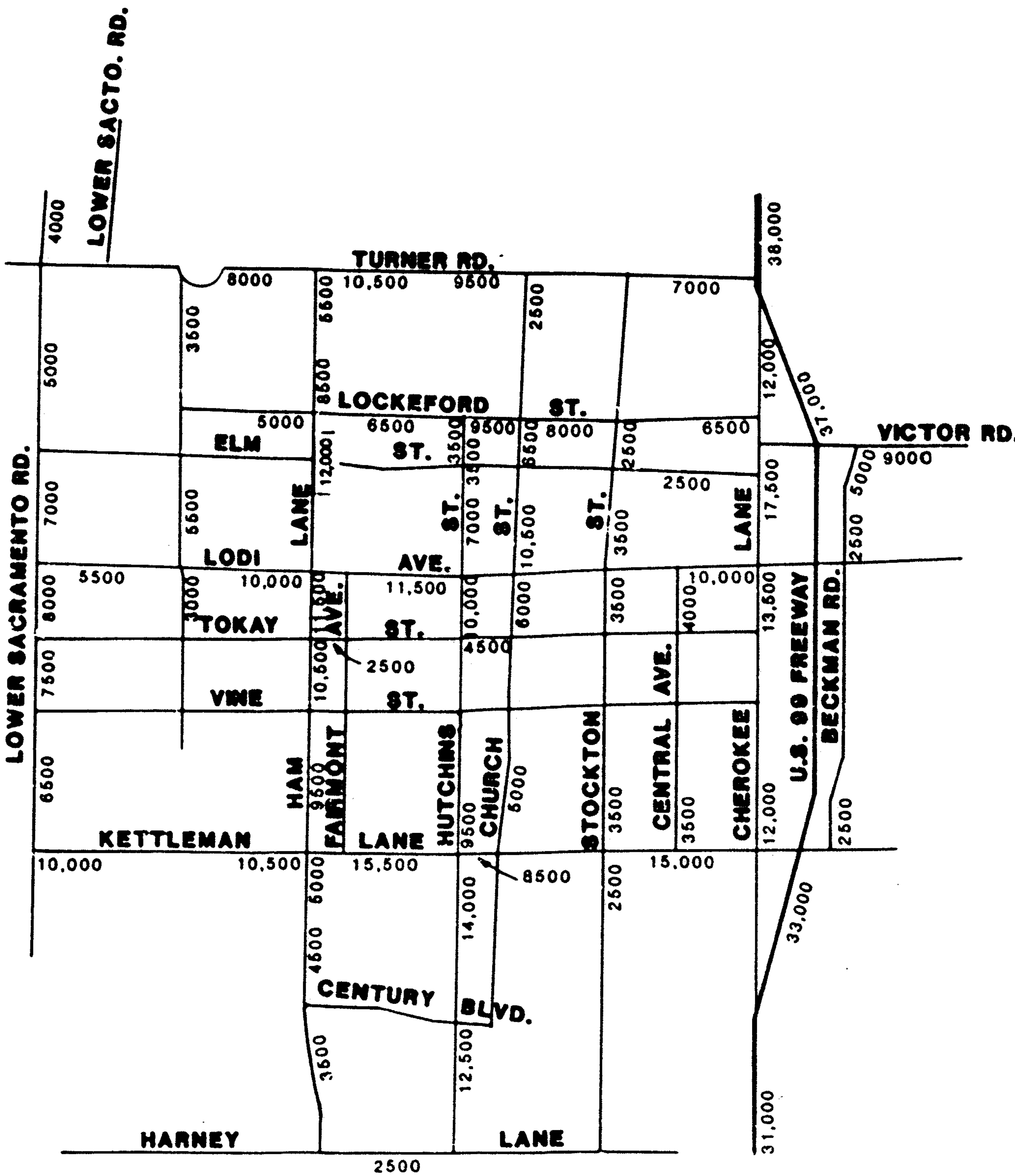
This segment is characterized by right-of-ways (R/W) varying from 50 to 65 and from 65 to 80 feet and by developed street widths of 44 to 50 feet. The street is not centered within the R/W. The narrowest developed width occurs in the Lodi to ~~Walnut~~ Oak block.

Ham Lane between Lodi Avenue and Elm Street is currently striped with two travel lanes. Intersections are marked with crosswalks and are controlled by stop lights at the Lodi Avenue and Elm Street intersections. The Walnut and Oak and Pine Street intersections are not signalized. Curbside parking is allowed on-street along both sides of Ham Lane from Lodi Avenue to Elm Street. The current on-street parking capacity is approximately 135 spaces.

The current traffic volumes along the project segment range between 12,400 to 14,100 ADT. Peak hour (7:00-9:00 A.M.; 4:00-6:00 P.M.) volumes are 660-940 and 1,050-1,120. Critical intersection approach movements at Ham/Lodi are 515 vehicles, while peak hour movements at Ham/Elm are 650 vehicles. ~~The capacity of Ham Lane at the critical Ham/Lodi intersection is A.~~ (See Figure 6.) Based on this data, the levels of service (LOS) at both the Lodi and Elm Street intersections is LOS A (see Table 1 for a definition of the various levels of service). However, it must be noted that during certain periods of the day, specifically when high school gets out at Lodi High, the southbound approach to the Ham and Lodi intersection experiences periods of congestion. Cycle failures and blockage of various intersection approach lanes are common occurrences. Southbound vehicles wishing to turn left onto Lodi Avenue ~~queue~~ back up and block access to the southbound Ham Lane throughlanes. These occurrences are short in duration and are difficult to quantify. For this reason, and because of limitations of analysis methodologies, the calculation of the level of service for these occurrences was not attempted. Current analysis methodologies are limited to calculating the LOS for an intersection using intersection approach volumes summed over a one-hour period. Thus, the peaks are averaged out during the analysis hour.

Land uses along the Ham Lane corridor consist primarily of residential development varying from single family to multiple family. There is some commercial development near Elm Street. Lodi High School, with access to Ham Lane on the west side of the study section, has a distinct influence on Ham Lane traffic flows. During the 11:00-3:00 P.M. hours, traffic volumes are very high in the southbound direction (570 VPH).

Table 2 presents a summary of existing conditions along Ham Lane from Lodi Avenue to Elm Street.



Average Daily Traffic Volumes

(1980-1981)

Figure 6

Table 1

LEVEL OF SERVICE DEFINITIONS

Level of Service	Traffic Flow Characteristics
A	Average overall travel speed of 30 mph or more. Freeflowing with no congestion. No signal cycle failures.
B	Average overall travel speed of 25-30 mph. Very few signal cycle failures and little or no congestion.
C	Average overall travel speed of 20-25 mph. Occasional signal cycle failures and moderate amount of congestion.
D	Average overall travel speed of 15-20 mph. Frequent signal cycle failures and associated congestion.
E	Average overall travel speed of about 15 mph. Unstable flow which includes almost continuous signal cycle failures and backups on approaches to the intersections. This represents the theoretical capacity of the facility.
F	Forced flow, with average overall travel speed of below 15 mph. Continuous signal cycle failure with backup on approaches going through upstream intersections in some cases.

FUTURE TRAFFIC VOLUMES

In order to properly evaluate the proposed project (and other suggested design options) future traffic volumes were calculated. The volumes were calculated in five-year increments (1990-2005) based on minimum and maximum values.

The minimum values are based on historic population and traffic volume growth for the City of Lodi (1965-1984). The maximum range was calculated using the historic growth rate in traffic volumes on Ham Lane itself (1965-1984).

Table 3, Future Traffic Projections, presents the results of these calculations.

Table 2

Summary of Existing Street Conditions

Ham Lane: Lodi to Elm

Physical Conditions						Traffic Conditions			
Land Uses West Side	 East Side	R.O.W. (feet)	Striping	Control Devices	Parking	Two-Way Volume (ADT + VPH)	Capacities	Level of Service (LOS)	On-Street Parking Spaces (Approx.)
Single Family Older Apts. Near Lodi Avenue Commercial (Animal Hospital and Nursery) Near Elm	Single Family Homes	50 to 65 to ~~85~~ 80	Two Lanes	Eight-Phase Traffic Signal at Lodi Four-Phase Traffic Signal at Elm	On-Street Parking Permitted (Parallel Curbside)	12,400 AM 660 PM 1,050 Near Elm 14,100 AM 940 PM 1,120 Near Lodi		Lodi at Ham LOS A Elm at Ham LOS A	62 West 73 East

Table 3

Future Traffic Projections Ham Lane

	1984			1990			1995			2000			2005		
Segment	ADT	PM Peak	One Way Peak	ADT	PM Peak	One Way Peak	ADT	PM Peak	One Way Peak	ADT	PM Peak	One Way Peak	ADT	PM Peak	One Way Peak
Minimum Alternative															
Lodi to Pine	14,100	1,120	580	15,200	1,220	620	16,500	1,320	670	17,900	1,430	730	19,400	1,550	790
Pine to Elm	12,400	1,050	570	13,500	1,150	610	14,600	1,240	660	15,900	1,350	720	18,400	1,560	830
Maximum Alternative															
Lodi to Pine	14,100	1,120	580	17,100	1,360	710	19,100	1,520	790	21,100	1,760	910	23,100	1,920	990
Pine to Elm	12,400	1,050	570	14,100	1,200	650	15,700	1,330	720	17,400	1,480	800	19,100	1,620	870

Note: Medium Alternative: City Wide Growth Rate 1.7% per Year

High Alternative: Lodi to Pine Growth Rate (Historic)
Pine to Elm Growth Rate (Historic)

IMPACTS AND MITIGATIONS

Impact: Decrease in existing and long-range traffic congestion.

Construction of the project as proposed would result in a decrease in existing traffic congestion. In addition, future traffic volumes into the foreseeable future (2005+) would be accommodated by the project. The current irregularities in street width would be eliminated, unsafe intersections would be improved and levels of service would remain high throughout the project life.

Mitigation

5. None required.

Impact: Decrease in pedestrian safety.

Due to an estimated increase in traffic speeds, higher volumes and greater distances to cross, pedestrians will have to wait longer for adequate gaps in traffic to make a safe crossing. School children and senior citizens are the most affected pedestrians. Area residents have indicated that simple crosswalk controls do not appear to facilitate street crossings.

Mitigation

6. Additional pedestrian safety devices may be needed which would include additional crosswalks, roadway warning signs, traffic guards and if necessary, traffic or pedestrian signals.

Impact: Potential delays to cross traffic.

Because of higher traffic volumes and more lanes to negotiate, cars on the side streets may have to wait longer to find a safe gap in traffic, thus causing more delay on these intersecting streets.

Mitigation

7. Traffic signals will be installed as traffic signal warrants are met. This would give the right-of-way to the vehicles on the side streets so they could make the desired traffic movements.

Impact: Potential for increased vehicle speeds.

Because drivers may perceive the road to be safer to drive at higher speeds, overall vehicle speeds may increase.

Mitigation

8. Speed limit signs, with strict enforcement by the local police, can help to reduce speeds. However, even these measures may not be entirely successful.

Impact: Decreased on-street parking.

The improvement of the intersections will result in the loss of some on-street parking. This will inconvenience residents living adjacent to the restricted area and create increased demand for adjacent spaces.

Mitigation

9. Provide all future developments have adequate off-street parking.

EXISTING CONDITIONS

The primary source of noise in the project area is traffic noise, both on Ham Lane and on major cross streets such as Lodi Avenue and Elm Street. Traffic noise along this stretch of roadway is of several types: noise levels resulting from passenger vehicles traveling at moderate speeds during peak hours; noise levels resulting from passenger vehicles traveling at reduced speeds during peak hours; passenger vehicles traveling at excessive speeds during any hour; and heavy trucks, motorcycles, buses and/or vehicles with faulty muffler systems traveling at moderate speeds during any hour. Other sources of noise in the area (overflying aircraft, barking dogs and similar urban disturbances) are present but do not contribute significantly to overall noise levels.

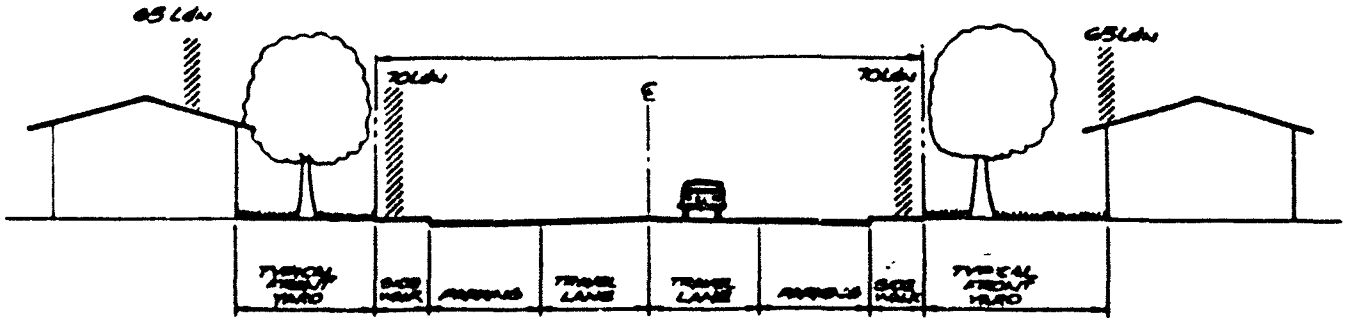
Background noise levels (i.e., noise levels generated by all the City activities throughout the area) are not high in this area. In other words, without the vehicular traffic along Ham Lane there are no adjacent noise sources of a constant level such as factories, industrial activities, processing, etc. The Southern Pacific railroad tracks and Route 99 traffic do contribute to background noise levels and are noticeable in the absence of noise from nearby sources (see Appendix C).

Ambient Noise Levels

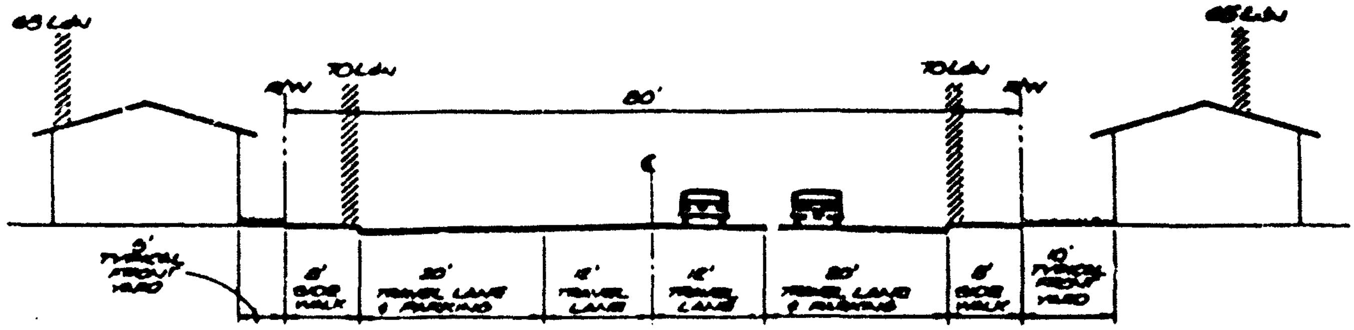
The traffic noise level at a given location is a combination of many factors, including the traffic volume, the noise level of each vehicle, vehicle speed, and the distance to the road. As most urban dwellers are aware, the traffic noise level near a busy street varies over a wide range. To indicate easily the overall noise level, single number descriptors are usually used. The most common descriptor for a short period is the hourly L_{eq}, which indicates the energy average of the varying noise level, and has been shown to be a good indicator of people's perceptions of noise level. Over a longer period, the L_{dn} descriptor is used, which is the long-term average of L_{eq}, with 10 dB added to the noise level for the nighttime period.

With basic information about local traffic, the roadside noise level can be modeled (computed) fairly accurately using equations that have been developed from field tests. The standard Highway Research Board traffic noise model, revised after extensive field measurements, has been used for this study. Roadside noise levels are estimated in Table 4 for existing traffic on Ham Lane, at 40 feet from the center of the street (approximately the middle of the average yard).

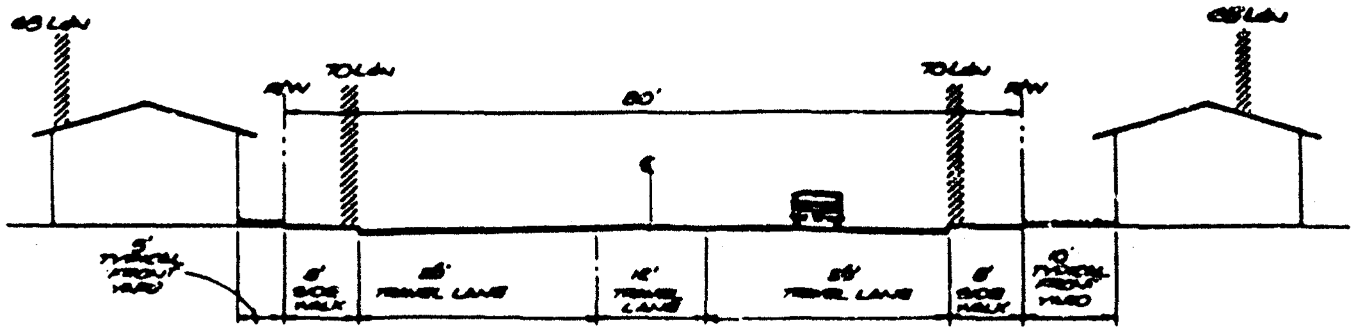
Peak passby noise levels on Ham Lane for passenger vehicles traveling at moderate speeds are approximately 60 to 70 dBA at a distance of 25 feet. Heavy trucks, motorcycles, buses and vehicles with faulty mufflers produce peak passby noise levels of 70 to 90 dBA at twenty-five feet. (See Figure 7.)



TYPICAL SECTION I
FUTURE NOISE LEVELS
WITHOUT THE PROJECT



TYPICAL SECTION 2
FUTURE NOISE LEVELS
WITH THE PROJECT



TYPICAL SECTION 3
FUTURE NOISE LEVELS
WITH THE PROJECT
AT MAJOR INTERSECTIONS

Noise Levels

Figure 7

Table 4
Present Ham Lane Noise Levels (dBA)

Location	Peak Hour	L_{eq} Noon	1:00 A.M.	L_{dn}
Front Yards	71	70	58	72

These noise levels are based upon an Average Daily Traffic (ADT) volume of 12,500 and a peak hour volume of 1,050 trips. The noise levels during periods other than the peak hour, and the L_{dn}, are based upon typical hourly variations of urban traffic throughout a normal day. Because of the relatively small front yards and the reflection of noise from the houses, the noise levels are not substantially different at the houses than at the sidewalk (1-2 dBA less).

The City of Lodi has adopted the San Joaquin County Noise Element (Reference 5), which recommends compatible uses for various noise levels. The suggested L_{dn} noise levels for residential land uses are outlined in Table 5.

Table 5
Recommerded Noise Levels for Residential Use

Land Use Category	L_{dn} Range
Normally Acceptable	Less than 60 dBA
Conditionally Acceptable	55 to 70
Normally Unacceptable	70 to 75
Clearly Unacceptable	Above 75

The guidelines are intended to assist in decisions about new residential construction, but they are useful in evaluating existing uses also. In terms of Noise Element guidelines, present noise levels adjacent to Ham Lane already exceed recommendations (see Appendix C).

Sensitive Receptors

The majority of properties adjacent to Ham Lane between Lodi Avenue and Elm Street are residential. Most of the residences are single family but there are also several duplexes and apartments. Commercial uses are located at Ham Lane and Elm Street and the Zion Reformed Church is located between Oak and Walnut Streets.

At a meeting on August 23, 1984, residents in the area indicated that vehicular noise levels along the street are already causing disturbances and irritation. Vibration, peak hour volumes and high school traffic were all cited as irritants. As indicated above, suggested standards for residential uses are already being exceeded.

IMPACTS AND MITIGATIONS

Impact: Increase in vehicular noise.

In order to quantify future noise levels resulting from the proposed project, the projected maximum traffic generation figures for four future dates and three possible options were used. The future vehicle speeds were projected to further refine the future noise potentials. Then the information was fed into a computer model which projected future noise levels 40 feet from the centerline (approximately the middle of the current average yard) for the alternatives. The results of this modeling are shown below:

Table 6

Projected Noise Levels (dBA)

Case	Vehicle Speed Peak	Vehicle Speed Other	L_{eq}	L_{dn}	Standard* Acceptable Range	Standard* Unacceptable Range	Reason for Increase
1995--4 lane 2 parking	30	35	73	74	60-70	70+	Increased Volumes
2005--4 lane 2 parking	30	35	74	76	60-70	70+	Increased Volumes
2005--4 lane 1 turn	30	35	76	77	60-70	70+	Increased Volumes
2005--2 lane (existing)	20	25	69	71	60-70	70+	Increased Congestion

*for residential uses, using L_{dn} measurement.

Table 6 demonstrates the relative effects of traffic volume, average vehicle speed and distance from the source on the noise level, when compared to present noise levels. The cases modeled do not include all possible combinations of volumes and lane configurations. However, the cases which have the highest noise potential are included. If the high-growth traffic projections do not occur, lower noise levels would be generated. (See Appendix C.)

It should also be noted that receptors not on Ham Lane, behind those directly facing the project, are exposed to 14-18 dBA less noise because of the combination of greater distance and the partial shielding provided by the buildings. The changes in project traffic noise for other receptor locations would be approximately the same as for those located on Ham Lane. However, Ham Lane traffic is not a dominant source of noise for receptors on other streets.

Two aspects are important when considering potential noise impacts of a project: the increase in noise level due to the project, and the project noise level itself.

From Table 6, traffic noise along Ham Lane could increase 3 to 5 dBA in the next 20 years with project implementation. In general, noise increases of 2 dBA or less usuually are not noticeable, unless the character of the noise is also changed significantly. Noise increases of 3 to 5 dBA ae definitely noticeable, and are potentially disturbing. The character of the noise is again important in the amount of disturbance caused. In the Ham Lane case, a 5 dBA increase in steady traffic noise over 20 years might not cause problems (it is typical in many urban locations). However, an increase in individual loud vehicles could cause considerable disturbance.

To evaluate the potential impact because of the overall noise level, land use planning guidelines for noise are used. As previously indicatd, the City-adopted noise standards are currently exceeded. Implementation of the project would increase those levels 2 to 5 dBA. In addition, acceptable interior noise levels should be less than 45 dBA L_{dn} due to exterior sources. This requirement is contained in State Title 25--Section 1092, Noise Insulation Standards, which apply to any new multi-family residential construction.

Standard residential building design and construction methods generally reduce outdoor noise by 20 to 25 dBA, with windows closed and no significant cracks or openings around windows or doors. With the best residential construction methods, and traffic noise levels of 70 dBA, Ham Lane interior noise levels would meet 45 dBA (L_{dn}) indoor standards. However, if windows are opened, interior noise levels will be only 10 to 15 dBA less than outdoors.

Mitigations

10. Construction of a low masonry barrier (2 to 2.5 feet high) along the front of residential properties was evaluated. However, the resulting 1-2 dBA reduction in noise levels would not be perceived as a noticeable reduction.

To achieve a 45 dBA interior noise environment, windows should be sealed, and forced ventilation provided. To deal with noise levels higher than 70 dBA, other improvements to the structures could be needed.

11. Although often undesirable for traffic engineering reasons, reducing average speeds on Ham Lane would reduce noise levels effectively.

12. Reduce local traffic volumes by improving desirability of alternatives to the automobile, such as car pools, bicycles and public transit.

13. Enforce California Vehicle Code prohibitions against faulty or modified loud exhaust systems--Sections 27150 and 27151. This can be implemented by local law officers without noise monitoring equipment to eliminate the worst offenders.

14. Implement an alternative which reduces the distance between affected properties and the travel lanes.

Impact: Temporary increase in construction noise.

The residential properties along Ham Lane would be the primary receptors for the temporary construction noise. For a period of four to eight weeks, sporadic noise levels of 80 to 90 dBA would be experienced. Although construction equipment would be idling part of the time, and would be producing maximum noise levels infrequently, intermittent construction noise disturbance is likely on all adjacent properties.

The initial site preparation phases would bring various types of demolition and excavation machines to the site, such as bulldozers, backhoes and large dump trucks. These generally have diesel engines and produce 80 to 90 dBA at a distance of 50 feet under full load. Jackhammers would be utilized for concrete and backtop removal which generate 85 to 90 dBA noise levels at 50 feet.

Second phase activities require similar equipment and produce similar noise levels. After removal of the existing road surface, curbs and sidewalks, the suface would be graded. Trucks would bring in the base materials to graded and rolled. Blacktop trucks and concrete mixing trucks bring the top surface materials. Final surface preparation by large rollers produces noise levels of 85 to 95 dBA at 50 feet.

Mitigations

15. Choose construction equipment which is of quiet design, has a high quality muffler system and is well maintained.

16. Install superior mufflers and engine enclosure panels when required on gas, diesel or pneumatic impact machines.

17. Restrict hours of use for motorized equipment--for example, 7:30 A.M. to 5:30 P.M., Monday through Friday.

EXISTING CONDITIONS

Regional Climate

The Mediterranean type climate of the San Joaquin Valley is characterized by mild and rainy winters and hot and nearly dry summers. There is a high percentage of sunshine. Appendix D presents details on local climate.

Ambient Air Quality

The air quality of a given area is not only dependent upon the amount of air pollutants emitted locally or within the air basin, but also is directly related to the weather patterns of the region. The wind speed and direction, the temperature profile of the atmosphere and the amount of humidity and sunlight determine the fate of the emitted pollutants each day, and determine the resulting concentrations of air pollutants defining the "air quality."

Air quality in Lodi and the San Joaquin Valley is subject to the problems experienced by many areas of California. Emissions from millions of vehicle-miles of travel each day often are not mixed and diluuted but are trapped near ground level by a temperature inversion. Pollutant concentrations are a result of local emissions in Lodi and also the transport of pollutants from other areas such as Stockton, Sacramento and even the Bay Area (with westerly winds). These sources produce concentrations which sometimes exceed ambient air quality limits established by the state Air Resources Board. Recent air quality data from the nearest ARB monitoring stations, Ham Lane in Lodi and Hazelton Street in Stockton, are tabulated in Table 7.

Ozone, the primary oxidant "smog" component, is produced by complex reactions of hydrocarbons and NO_x in the atmosphere. Both vehicles and the use of organic chemicals produce emissions which drive the chemciai reaction. Daily ozone concentrations are heavily dependent upon the weather and atmospheric stability, and thus vary substantially from year to year. Adverse atmospheric conditions in 1980 produced 78 exceedances of the 10 ppm hourly standard in Lodi, and over two dozen ozone exceedances were still recorded in 1981 and 1982.

Carbon monoxide, like oxidant, is also heavily dependent upon both vehicle emissions and weather. However, no exceedances of either the 9 ppm 8-hour ambient standard or the 20 ppm 1-hour standard have been recorded recently in Lodi. Both oxidant and CO have been reduced significantly by improved emission controls on new automobiles in the past decade.

Table 7

Ambient Air Quality
San Joaquin County

Pollutant	1980	1981	1982	Standard	Measured Units
Ozone (1)					
Maximum	14	13	13	10	pphm, 1-hr ave
Exceedances	78	26	28	1	days per year
Carbon Monoxide (1)					
Maximum hour	10	9	12	20	ppm, 1-hr ave
Maximum 8-hour	5	4	7	9	ppm, 8-hr ave
Exceedances 8-hour	0	0	0	1	days per year above 9 ppm
Nitrogen Dioxide (2)					
Maximum	13	14	19	25	pphm, 1-hr ave
Exceedances	0	0	0	1	days per year
Sulfur Dioxide (2)					
Maximum	4	3	3	5	pphm, 24-hr ave
Exceedances	0	0	0	2	% of days per year
Total Suspended Particulates (2)					
Annual Geom. Mean	85	79	66	60	ug/m^3 ave
Daily Exceedances	34	22	20	2	% of days above 100 ug/m^3

Source: California Air Resources Board monitoring data for:
(1) Ham lane station in Lodi
(2) Hazelton Street station in Stockton

Total suspended particulates are produced by vehicles, heavy industry and soil-moving activities such as construction and farming. In Stockton, ten miles south of the project area, the annual average (annual geometric mean) TS concentration has been consistently above the 60 ug/m^3 ambient standard. The daily average standard of 100 ug/m^3 was also exceeded on over 34% of the days tested din 1980 and over 20% of the days in both 1981 and 1982.

Sulfur dioxide is primarily associated with chemical and refining industries and is not a problem in San Joaquin County. The superior controls required on chemical process plants are largely responsible for this achievement. Nitrogen oxides are heavily produced by vehicles and high-temperature industrial operations, but as yet have not produced serious concentrations in the region (Shelley, 1984).

IMPACTS AND MITIGATIONS

Impact: Incremental decrease in local emission concentrations as a result of project implementation.

Because the intent of the project is to improve the flow of traffic on Ham Lane by providing more lane capacity, air quality emissions and impacts would be lower on Ham Lane and on neighboring streets as higher average speeds are achieved through less congested traffic flow. However, lower emissions per vehicle would be offset somewhat by anticipated increases in vehicle volumes in future years. The project will not generate additional new trips system-wide, but only will accommodate future projected traffic volumes.

Vehicles are responsible for the emission of a number of pollutants--hydrocarbons, particulates, NO_x and others. The most widely-used indication of vehicular emissions impact is to model concentrations of carbon monoxide (CO) at nearby sensitive receptor locations. Roadside CO concentrations are directly related to the number of vehicle trips on nearby streets and to the average vehicle emission rate. However, average emissions decrease as average speed increases. The actual concentrations at the receptors are determined by the speed and direction of the wind and the temperature layers in the lower atmosphere. Atmospheric conditions control the mixing, diffusion and transport of the pollutants after they are emitted.

Roadside CO concentrations were modeled for two no project and two project case studies, based upon different lane configurations and traffic volumes. (See Appendix D for model details.) Table 8 presents the various traffic volumes and resulting changes in roadside CO concentrations. Average Ham Lane speeds are estimated to be 30 mph during peak hour and 35 mph at other time for the various project years. The "no project" option would be seriously congested and speeds are estimated to be 20 mph at peak hour and 25 mph at other times.

The concentrations listed in Table 8 are based only upon vehicles on Ham Lane. The total CO concentration would include a variable background concentration of from 1 to 5 ppm from other vehicular emissions and sources in the area.

The modeled concentrations show the effects of the gradual increase of traffic volumes assuming no project (1985), and the proposed project (1995, 2005). No project (2005) concentrations are caused by congestion and low speeds with only two traffic lanes. Neither the state 20 ppm peak-hour standard nor the 9 ppm 8-hour standard are threatened by the Ham Lane traffic in any case. The project would be expected to reduce slightly local CO concentrations relative to a two-lane road.

Another way to evaluate the potential impact of the proposed project is to estimate the overall change in vehicular emissions produced by the project. The total emissions produced by a group of vehicles depends upon the number of trips, the trip length and the average speed. Since the total number of trips and trip length are not changed by the Ham Len project, the average speed is

Table 8
Ham Lane Project
CO Concentrations

	Case	Year	Traffic Volumes	Peak Hour CO	High 8-Hour CO
1.	No Project Two Lanes	1985	12,500 ADT	1.1	0.3
2.	Project Four Lanes	1995	20,300 ADT	1.3	0.4
3.	Project Four Lanes	2005	25,300 ADT*	1.6	0.5
4.	No Project Two Lanes	2005	25,300 ADT*	2.0	1.0

Source: Stan Shelley, 1984

the only variable which affects total emissions. Based upon an estimated higher average speed (35 mph vs. 25 mph) with project implementation, total estimated emissions on Ham Lane would change as follows:

CO	28%
NMHC	19%
NO_x	+7%
Part	No Change

Particulate emissions are not related to speed and that as speed increases, oxides of nitrogen are slightly increased, which is opposite to CO and non-methane hydrocarbons. The CO pollutant is the most sensitive to speed and therefore would benefit the most from the reduced congestion offered by the four lanes.

Mitigation

18. None required as the project appears to have a net benefit to local air quality. Increasing average vehicle speed by increasing the number of traffic lanes on congested routes is itself an air quality mitigation measure recommended on some types of projects to offset increasing trip volumes.

* These figures were calculated from a preliminary "worst case" analysis which was later modified downwards to 23,100.

the dominance of the unstable low-pressure systems during the winter, and less sunshine, conditions favoring smog formation are at a minimum. At this time of year stable atmospheric conditions produce heavy ground fog, which may cover much of the Central Valley for several days to several weeks. Average maximum winter temperatures in Lodi and Stockton are nearly 60° F., and average evening lows are about 40° F.

The north end of the San Joaquin Valley receives about 14 inches of precipitation annually. Very little rain falls in May and October, usually near half an inch, and almost none from June through September. A majority of the rainfall comes in December, January and February --- about 2.5 inches per month in normal rainfall years.

B. Ambient Air Quality

Air quality in Lodi and the San Joaquin Valley is subject to the problems experienced by many areas of California. Emissions from millions of vehicle-miles of travel each day often are not mixed and diluted, but are trapped near ground level by a temperature inversion. Pollutant concentrations are a result of local emissions in Lodi, and also the transport of pollutants from other areas such as Stockton, Sacramento, and even the Bay Area (with westerly winds). These sources produce concentrations which sometimes exceed ambient air quality limits established by the state Air Resources Board. Recent air quality data from the nearest ARB monitoring stations, Ham Lane in Lodi and Hazelton Street in Stockton, are tabulated in Exhibit 1.

Ozone, the primary oxidant "smog" component, is produced by complex reactions of hydrocarbons and NO_x in the atmosphere. Both vehicles and the use of organic chemicals produce emissions which drive the chemical reaction. Daily ozone concentrations are heavily dependent upon the weather and atmospheric stability, and thus vary substantially from year to year. Adverse atmospheric conditions in 1980 produced 78 exceedances of the 10 ppm hourly standard in Lodi, and over two dozen ozone exceedances were still recorded in 1981 and 1982.

EXHIBIT 1

AMBIENT AIR QUALITY

San Joaquin County

POLLUTANT	1980	1981	1982	Std	Meas Units
OZONE (1)					
Maximum	14	13	13	10	pphm, 1-hr ave
Exceedances	78	26	28	1	days per year
CARBON MONOXIDE (1)					
Maximum hour	10	9	12	20	ppm, 1-hr ave
Maximum 8-hour	5	4	7	9	ppm, 8-hr ave
8-hour exceedances	0	0	0	1	days per year above 9 ppm
NITROGEN DIOXIDE (2)					
Maximum	13	14	19	25	pphm, 1-hr ave
Exceedances	0	0	0	1	days per year
SULFUR DIOXIDE (2)					
Maximum	4	3	3	5	pphm, 24-hr ave
Exceedances	0	0	0	2	% of days per year
TOTAL SUSPENDED PARTICULATES (2)					
Annual Geom. Mean	85	79	66	60	ug/m^3 ave
Daily exceedances	34	22	20	2	% of days above 100 ug/m^3

Source: California Air Resources Board monitoring data for:
(1) Ham Lane station in Lodi
(2) Hazelton Street station in Stockton

Carbon monoxide, like oxidant, is also heavily dependent upon both vehicle emissions and weather. However, no exceedances of the either the 9 ppm 8-hour ambient standard or the 20 ppm 1-hour standard have been recorded recently in Lodi. Both oxidant and CO have been reduced significantly by improved emission controls on new automobiles in the past decade.

Total suspended particulates are produced by vehicles, heavy industry, and soil-moving activities such as construction and farming. In Stockton, ten miles south of the project area, the annual average (annual geometric mean) TSP concentration has been consistantly above the 60 ug/m^3 ambient standard. The daily average standard of 100 ug/m^3 was also exceeded on over 34% the days tested in 1980, and over 20% of the days in both 1981 and 1982.

Sulfur dioxide is primarily associated with chemical and refining industries, and is not a problem in San Joaquin County. The superior controls required on chemical process plants are largely responsible for this achievement. Nitrogen oxides are produced heavily by vehicles and high-temperature industrial operations, but as yet have not produced serious concentrations in the region.

II. POTENTIAL AIR QUALITY IMPACTS OF PROJECT

A. Sensitive Receptor Locations

The air quality impacts or benefits of the Ham Lane Improvement Project would be felt most directly on the properties along the improved section. A majority of the properties along the project are residential, with a church and a few commercial land uses making up the remainder. The extent of the change in local vehicle- related pollutants is evaluated in the following sections.

B. Data and Methodology

Vehicles are responsible for the emission of a number of pollutants -- hydrocarbons, particulates, NOx, and others. The most widely-used indication of vehicular emissions impact is to model concentrations of carbon monoxide (CO) at nearby sensitive receptor locations. Roadside CO concentrations are directly related to the number of vehicle trips on nearby streets, and to the average vehicle emission rate. However, average emissions decrease as average speed increases. The actual concentrations at the receptors are determined by the speed and direction of the wind, and the temperature layers in the lower atmosphere. Atmospheric conditions control the mixing, diffusion, and transport of the pollutants after they are emitted.

The model used for this study (Ref. 4) is based upon standard Gaussian line source diffusion relationships developed by Turner (Ref. 5) and others. Worst-case assumptions include very poor atmospheric conditions (wind speeds of 1 to 2 meters per second and low temperature inversion height), which occur on numerous occasions each year in the area.

Roadside concentrations of CO have been computed for both peak-hour and maximum eight-hour traffic conditions on Ham Lane, at a distance of 40 feet from the middle of the road (about the middle of the average yard). Distance is not a significant air quality factor, however, since concentrations decrease very slowly as distance increases. Composite vehicle emission factors are from the Air Resources Board EMFAC program (Ref. 6).

C. Project Traffic Impacts

The intent of the project is to improve the flow of traffic on Ham Lane by providing four traffic lanes and therefore more capacity. As higher average speeds are achieved through less- congested traffic flow, air quality emissions and impacts would be lower on Ham Lane and on neighboring streets. However, lower emissions per vehicle would be offset somewhat by anticipated increases in vehicle volumes in future years. Since no new trips are being generated by the project, the total number in the area will stay the same.

Roadside CO concentrations were modeled for two No-Project cases and two Project cases for comparison, based upon different lane configurations and traffic volumes:

Case 1 : No-Project, two lanes, 1985, ADT of 12,500.
Case 2 : Project, four lanes, 1995, ADT of 20,300.
Case 3 : Project, four lanes, 2005, ADT of 25,300.
Case 4 : No-Project, two lanes, 2005, ADT of 25,300.

Average Ham Lane speeds are estimated to be 30 mph during peak hour and 35 mph at other times for Cases 1, 2, and 3. Case 4 would be seriously congested, and speeds are estimated to be 20 mph at peak hour and 25 mph at other times. Traffic projections are from the project traffic study by TJKM Transportation Consultants, Sacramento. Exhibit 2 compares t roadside concentrations for the most significant cases. Other cases no evaluated would produce smaller changes in roadside CO concentrations.

Exhibit 2 - Ham Lane Project CO Concentrations (ppm)

CASE	PEAK HR	HIGH 8 HR.
1. No-Project, 1985	1.1	0.3
2. Project, 1995	1.3	0.4
3. Project, 2005	1.6	0.5
4. No-Project, 2005	2.0	1.0

It should be noted that the Exhibit 2 concentrations are based only upon vehicles on Ham Lane. The total CO concentration would include a variable background concentration of from 1 to 5 ppm from other vehicular emissions and sources in the area.

The modeled concentrations show the effects of the gradual increase of traffic volumes in Cases 1, 2 and 3. Case 4 concentrations are caused by congestion and low speeds with only two traffic lanes. Neither the state 20 ppm peak hour standard nor the 9 ppm eight hour standard are threatened by the Ham Lane traffic in any case. The project would be expected to reduce slightly local CO concentrations relative to a two-lane road.

D. Overall Project Impacts

Another way to evaluate the potential impact of the Ham Lane Improvement Project is to estimate the overall change in vehicular emissions produced by the project. The total emissions produced by a group of vehicles depends upon the number of trips, the trip length, and the average speed. Since the total number of trips and trip length are not changed by the project, the average speed is the only variable which affects total emissions. Based upon an estimated higher average speed (25 mph vs. 35 mph) with project implementation, total emissions on Ham Lane would be as shown in Exhibit 3.

Exhibit 3 - CHANGES IN HAM LANE VEHICLE EMISSIONS

	CO	NMHC	NO_x	PART
Project Change	-28 %	-19 %	+7 %	no chg

The Exhibit 3 analysis is derived from the average emissions factors listed in Reference 6 for the different average speeds. Note that particulate emissions are not related to speed, and that as speed increases, oxides of nitrogen are slightly increased, which is opposite to CO and non-methane hydrocarbons. The CO pollutant is the most sensitive to speed, and therefore would benefit the most from the reduced congestion offered by the four lanes.

E. Potential Construction Impacts

During the grading and construction phase, dust may be produced, particularly during the dry months of the year. Particulate generation can be minimized by standard sprinkling procedures on dusty working areas at least once a day.

III. Project Mitigation Measures

This project would appear to have a net benefit to the local air quality and therefore does not require mitigation. Increasing average vehicle speed, by increasing the number of traffic lanes on congested routes, is itself an air quality mitigation measure recommended on some types of projects to offset increasing trip volumes.

AIR QUALITY REFERENCES

CLIMATOLOGY

1. Felton, E.L., California's Many Climates, Pacific Books, Palo Alto, 1965.

2. Station Climatic Summaries, U. S. Naval Weather Service Environmental Detachment, Asheville, N.C.

AIR QUALITY

3. CAlifornia Air Quality Data, Annual summaries of station air quality data, Technical Services Division, California Air Resources Board, Sacramento.

MODELING

4. Guidelines for Air Quality Impact Analysis of Projects, BAAQMD (then BAAPCD), June 1975, and updates.

5. Turner, D. Bruce, Workbook of Atmospheric Dispersion Estimates, AP-26, U.S. Environmental Protection Agency, 1970.

6. "ENV028" computer program to determine annual composite vehicle emission rates, based upon "EMFAC 6C" vehicle-specific emission rate program, California Air Resources Board, Sacramento.

APPENDIX

COMMON AIR QUALITY TERMS AND DEFINITIONS

Air basin or airshed - a region which, due to its geography and topography, tends to contain air pollutants emitted within it.

Air pollutant - a substance in the atmosphere which is harmful or undesirable.

Air quality - the amount of pollutants in the air relative to existing ambient air quality standards*.

Air Resources Board (ARB) - California agency responsible for state air quality planning and control program.

Ambient Air Quality Standards - exposure limits established for various air pollutants by state and federal agencies.

Bay Area Air Quality Management District (BAAQMD) - nine-count y agency responsible for air quality planning and control in the San Francisco Bay area.

Carbon monoxide (CO) - an odorless and invisible gas pollutant produced primarily by vehicle operation. Reduces oxygen-carrying capacity of the blood, causing headache, fatigue, coordination disfunction, and cardio-respiratory stress.

Concentration - the amount of a pollutant in a given volume or sample of air.

Department of Environmental Protection (NDEP) - Nevada agency responsible for state air quality planning and control programs.

Dispersion - the process of mixing, dilution, and transport of air pollutants.

Emission - discharge of a substance into the air.

Environmental Protection Agency (EPA) - federal agency with overall responsibility for national and state air quality planning and control programs.

Hydrocarbons (HC) - a large group of compounds containing hydrogen, carbon and various other elements, and found in fossil fuels, paints and solvents. They cause plant damage, odor, and contribute to smog* formation.

Inversion - a reversal of the normal temperature lapse rate* in the atmosphere, producing a stable high-temperature layer above a lower-temperature layer.

Line source - a linear group of pollutant emitters, such as vehicles on a roadway.

Micrograms per cubic meter ($\mu g/m^3$) - a common unit of measurement of particulate concentration* in weight per unit volume.

Mixing layer - when an atmospheric temperature inversion* exists, the layer of air below the inversion altitude in which air pollutants are confined.

Modeling - a technique of using estimated source emissions and meteorological information to compute expected air pollutant concentrations.

Monitoring - regular measurement of air pollutant concentrations.

Nitrogen oxides (NO_x)- formed during high-temperature combustion processes, several gaseous pollutants cause plant damage, eye and lung irritation, and discoloration of materials. Nitrogen dioxide causes the typical brown color of smog.*

Odor - can be aesthetically unpleasant, and cause illness in some cases. Common problem gases include hydrogen sulfide, ammonia, and some organic vapors.

*defined elsewhere

Organic compounds - a very large group of substances containing carbon, found in all living matter, and also fossil material such as coal and petroleum. They are often released when extracted, processed, and/or burned.

Oxidants - a highly-active group of chemicals (mostly ozone in air) formed in the atmosphere by the photochemical reaction* of hydrocarbons*, nitrogen oxides*, and sunlight. Causes extensive vegetation damage, eye irritation, headache, and impaired breathing.

Ozone (O_3) - see Oxidants above.

Particulates, total suspended (TSP) - include solid particles, dust, and smoke, and are produced by industrial processes, combustion, and vehicles. They damage plants and materials, reduce sunlight and visibility, and carry irritating chemicals into the respiratory system.

Parts per million (ppm) - a common unit of measurement of gaseous pollutant concentration in relative volume of pollutant per million volumes of air.

Photochemical reaction - the atmospheric combination of hydrocarbons* and oxides of nitrogen to form oxidants* and smog*, driven by the energy from intense sunlight.

Point source - a single stationary souce of air pollution.

Primary air quality standards - recommended limits to air pollutant concentrations based upon criteria for protection of human health.

Secondary air quality standards - recommended limits to air pollutant concentrations based upon criteria for protection of property and aesthetics.

Smog - the combination of air pollutants found during intense photochemical reaction.*

Source - a process, activity, or machine which emits air pollution.

Stagnation - an extremely stable atmospheric condition in which little vertical or horizontal dispersion* of emitted pollutants occurs.

Sulfur oxides - are produced by processing and combustion of fossil fuels which have sulfur content. These gaseous pollutants are toxic to plants, deteriorate materials, and in combination with particulates, contribute to serious respiratory illness.

Temperature lapse rate - the normal atmospheric temperature profile which decreases as altitude increases. See Inversion*.

Transport - the movement of emitted pollutants by wind or thermal action.

Visibility reduction - is caused by suspended very small particles, water vapor, smoke, and gases with color.

*defined elsewhere