

AD-A269 499



2



DISTINGUISH STATEMENT A

Approved for public release
Distribution Unlimited

DTIC
ELECTE
SEP 07, 1983
S R D

**Best
Available
Copy**



**Air Force
Environmental Planning Division
(HQ USAF/CEVP)**

Room 5B269
1260 Air Force Pentagon
Washington, DC 20330-1260

16 JUL 93

MEMORANDUM FOR DTIC (Acquisition)

(ATTN: Jack Mauby)

*SUBJ: Distribution of USAF Planning
Documents Forwarded on 1 JUL 93*

*ALL the documents forwarded to
your organization on the subject
date shall be considered*

*Approved for Public Release, Distribution
is unlimited (Distribution statement A).*

Jack Mauby, Gm-14
Mr. Jack Mauby
Special Projects and Plans
703-697-2928
DSN 227-2928

FINAL REPORT
DEPARTMENT OF THE AIR FORCE
in cooperation with
WYOMING OFFICE OF INDUSTRIAL SITING ADMINISTRATION

CHEYENNE IMPACT CORRIDOR PLAN

City of Cheyenne, Laramie County
Wyoming Highway Department

Preparation of this Community Impact Planning
Report was funded by a grant from the Department
of the Air Force to the Wyoming Office of
Industrial Siting Administration.

Prepared by:

ARIX, A Professional Corporation
Engineers Architects Planners
800 8th Avenue
Greeley, CO 80632

December, 1984

93-20544
■■■■■■■■■■

1028

TABLE OF CONTENTS

	<u>Page No.</u>
1. Introduction	1
1.1 Project Background	1
1.2 Scope and Objectives	1
1.3 Study Area Definition	2
1.4 Methodology	5
1.5 Evaluation Criteria and Standards	6
2. Corridor Analyses	8
2.1 Pershing Boulevard -- Warren AFB to Converse	8
2.2 Yellowstone/Central-Warren -- Prairie to College Drive	16
2.3 Lincolnway -- Missile Drive to Converse	23
2.4 19th/20th -- Happy Jack/Missile Drive to Converse	30
2.5 Missile Drive/Lincolnway/Deming/9th -- Happy Jack to Duff	36
2.6 Logan -- Pershing to 5th/Duff	41
2.7 Randall/Pioneer-Carey -- Pershing to Lincolnway	45
2.8 Fox Farm -- Walterscheid to Avenue C	51
2.9 Avenue "C" -- College Drive to 5th/Duff	54
2.10 Prairie/Dell Range -- Yellowstone to Windmill	59
2.11 College -- Parsley Blvd. to Avenue C	64
2.12 Converse -- Dell Range to Lincolnway	69
2.13 Evans -- Lincolnway to 8th Avenue/Warren	74
3. Impact Corridor Improvement Plan	79
3.1 General Improvement Actions	79
3.2 Immediate Action Plan	82
3.3 Short Range Plan	83
3.4 Future Improvement Projects	85

APPENDICES

- A. Special Studies
- B. Technical References

DTIC QUALITY INSPECTED 1

Accession For	
NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

LIST OF FIGURES

		<u>Page No.</u>
I.	Study Area Impact Corridors	4
1.A-B	Pershing Boulevard Corridor	13, 14
2.A-D	Yellowstone/Central-Warren Corridor	19, 20, 21, 22
3.A-B	Lincolnway Corridor	28, 29
4.A-B	19th/20th Streets Corridor	34, 35
5.A-B	Missile Drive/Lincolnway/Deming/9th Street Corridor	39, 40
6.	Logan Avenue Corridor	44
7.A-B	Randall/Pioneer-Carey Corridor	49, 50
8.	Fox Farm Corridor	53
9.A-B	Avenue "C" Corridor	57, 58
10.A-B	Prairie/Dell Range Corridor	62, 63
11.A-B	College Drive Corridor	67, 68
12.A-B	Converse Avenue Corridor	72, 73
13.A-B	Evans Avenue Corridor	77, 78

LIST OF TABLES

1.1	Preliminary Impact Corridor Study Locations	2
1.2	Impact Corridor Study Area	5

1. INTRODUCTION

1.1 Project Background

The United States Air Force is preparing plans to deploy the Peacekeeper intercontinental ballistic missile system in an area covering south-eastern Wyoming and western Nebraska. The missile operations and support functions will be located at Francis E. Warren Air Force Base (Warren) near Cheyenne. Missile launch facilities will be located at several existing Minuteman silos throughout the deployment area.

The proposed deployment is expected to produce increased levels of construction activity at both Warren and the silos. Both temporary and permanent increases in population in the Cheyenne area are contemplated, associated with construction activity, Air Force operations at Warren, and secondary impacts within the community.

The Air Force prepared an Environmental Impact Statement which addressed the potential effects of the proposed deployment in each of 13 resource areas. One of these, Transportation, is considered in the Final Environmental Planning Technical Report - Transportation (EPTR-T) dated January, 1984. The EPTR-T identified several routes and/or locations within the City of Cheyenne which could be potentially affected by traffic associated with the proposed Peacekeeper deployment.

The Air Force also provided grant funding for detailed community impact planning to address some of the potential problems associated with deployment of the Peacekeeper system. One of the program categories included in this impact planning program dealt with planning mitigation measures for Cheyenne streets impacted by the proposed action.

1.2 Scope and Objectives

The Cheyenne Impact Corridor Plan addresses the traffic problems identified in the EPTR-T, analyzes alternative ways of mitigating these problems in the context of current and programmed transportation system improvements, and recommends actions which could be taken by local jurisdictions to resolve remaining transportation system deficiencies.

The emphasis of this investigation is on traffic operations problems which are reasonably related to the effects of the proposed Peacekeeper deployment. This includes both existing traffic operations conditions which are deficient and will likely become worse, and existing conditions which are now satisfactory but which may become deficient as a result of increased traffic demand. The investigation also considers planned or programmed street and traffic improvement projects, to assess the extent to which these actions would mitigate anticipated traffic impacts. Thus the recommended actions identified in this study are intended to supplement projects already planned or programmed by local entities and to address Peacekeeper related traffic impacts which are expected to remain after these projects are completed.

The primary objective of the Impact Corridor Plan is to assist local and state entities in transportation system improvement project planning and programming. Particular emphasis is identification of improvement needs

resulting from Peacekeeper deployment actions, and relating these needs to program funding options not generally available to support transportation projects which are justified as a result of development-induced traffic increases, or requirements to replace or rehabilitate the existing transportation infrastructure.

1.3 Study Area Definition

The Impact Corridor Plan study area includes the collector, minor arterial and principal arterial street system contained within the Cheyenne Urban Boundary, as defined on the "Cheyenne Urban System and Roadway Functional Classification" map, dated 1983. This includes all significant streets and highways within the developed area.

The study area is further constrained by the results of work already completed in the EPTR-T. This environmental assessment evaluated current and projected traffic, assuming deployment of the Peacekeeper system, and located those areas where traffic increases were likely to be significant. The study area deliberately excludes locations where potential traffic problems might result from non-Peacekeeper related actions (e.g. development of a commercial generator or new residential subdivision).

Table 1.1 summarizes the corridors and intersections which were deemed impacted by Peacekeeper generated traffic. Local agencies were requested to review these and provide supplemental information concerning possible additions to the initial list, and to provide assessments of the relative priority of these study locations. Supplemental study locations were considered if they were in or near already identified study corridors, or were in areas in which other Peacekeeper related impacts (eg. additional housing needs) had been potentially identified, such as the South Cheyenne area.

TABLE 1.1

PRELIMINARY IMPACT CORRIDOR STUDY LOCATIONS

<u>Corridors</u>	<u>Reference</u>
Missile Drive to Deming Drive	1, 3
Deming Drive - 9th Street to Converse Avenue	1
Converse Avenue - Dell Range Blvd. to Pershing Avenue	1
Lincolnway - Missile Drive to Converse Avenue	1, 3
19th/20th Streets - Missile Drive to Pershing Blvd.	1, 3
Yellowstone/Central - Prairie Avenue to 8th Avenue	1, 3
Evans Avenue - Lincolnway to Pershing Blvd.	1
Logan Avenue - Pershing to Duff/5th Street	3
Randall - Pershing to Carey	3
Dell Range - Converse to Windmill	3
Pershing at Snyder	2, 3
Pershing at Central	2
Pershing at Warren	2, 3
Pershing at Evans	2, 3
Pershing at Converse	2, 3
Pershing at F.E. Warren Gate	2, 3
Randall at I-25	2, 3

TABLE 1.1 (cont'd)

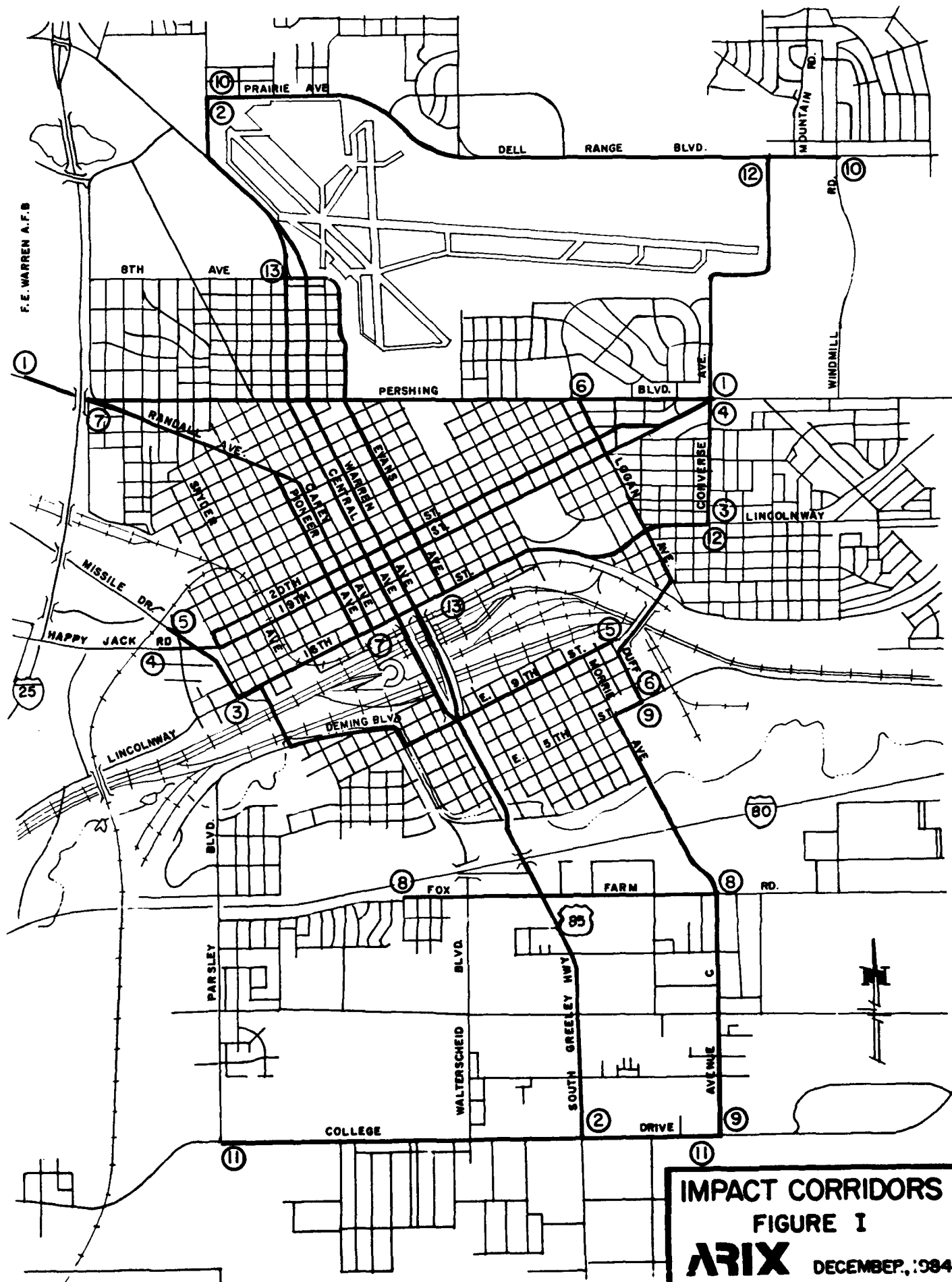
Intersections

Randall at Snyder	2, 3
Logan at 20th	2
Morrie at 20th	2
Evans at 20th	2
Warren at 20th	2
Central at Yellowstone	2, 3
Central at 24th	2, 3
Central at 20th	2
Carey at 24th	2, 3
Carey at 20th	2
Pioneer at 20th	2
Snyder at 20th	2
Ames at 16th	2, 3
Prairie at Yellowstone	2
Fox Farm at Walterscheid	3
Fox Farm at Greeley Highway	3
Fox Farm at Avenue "C"	3
College Drive at Walterscheid	3
College Drive at Greeley Highway	3
College Drive at Avenue "C"	3

References: 1 - EPTR-T, p. 3-24
 2 - EPTR-T, p. A-16, 17
 3 - ChATPP letter, 9/24/84 and local agency discussions

The candidate locations were plotted on a base map and an initial reconnaissance was conducted of the proposed study area. This preliminary assessment quickly confirmed the merits of the candidate locations. Equally important, the initial list suggested, but did not define, a coherent arterial system network. After briefly reviewing the proposed study area it seemed desirable and appropriate to define it in terms of corridors logically connected together to form a network which served the bulk of the urban area. One primary reason for this modification is that actions proposed within one corridor may have effects on parallel or intersecting corridors. It was felt important to the overall network evaluation that some continuity be provided: rather than look at isolated intersections or short segments of streets by themselves, they should be examined in the context of their relationship to the overall street system.

Table 1.2 lists the modified study area corridors developed from this preliminary assessment. Figure I shows these corridors as they relate to the urban area street system and emphasizes the network continuity of the defined corridors.



IMPACT CORRIDORS
FIGURE I
ARIX DECEMBER, 1984

TABLE 1.2

IMPACT CORRIDOR STUDY AREA

1. Pershing Blvd. -- Warren AFB to Converse
2. Yellowstone/Central-Warren -- Prairie to College Drive
3. Lincolnway -- Missile Drive to Converse
4. 19th/20th Streets - Happy Jack/Missile Drive to Converse
5. Missile Drive/Lincolnway/Deming/9th -- Happy Jack to Duff
6. Logan -- Pershing to 5th/Duff
7. Randall/Pioneer-Carey -- Pershing to Lincolnway
8. Fox Farm -- Walterscheid to Avenue "C"
9. Avenue "C" -- College Drive to 5th/Duff
10. Prairie/Dell Range -- Yellowstone to Windmill
11. College Drive -- Parsley Blvd. to Avenue "C"
12. Converse -- Dell Range to Lincolnway
13. Evans -- Lincolnway to 8th Avenue/Warren

1.4 Methodology

The basic approach for the analysis of each corridor follows a five step sequence of work, as described below.

Step 1 is to define Existing Conditions. This includes assembly of available data concerning the corridor, such as accident information, traffic volume counts, traffic control (signal timing, phasing and offsets; regulatory and warning signs; pavement markings), roadway layout (width, lane marking, parking condition) and right-of-way. Available data is supplemented by field reconnaissance of the corridors, to collect detailed intersection operations information (turn movements, queueing, lane encroachment, weaving conflict), observe land use and locate special generators, and identify any special conditions which should be considered.

Step 2 is to analyze the information and develop a Problem Statement. At the corridor level this serves to identify areas which generally operate satisfactorily, and isolates specific locations (intersections, intersection approaches, segments of roadway) where delay, congestion, conflict or other traffic barriers exist. Problem definition includes not only identification of symptoms but also identification of causal conditions.

Step 3 is to identify any Planned or Programmed Improvements near or within the corridor which may affect traffic operations, in either a favorable or negative direction. This step is important for three reasons. First, it considers system level effects of new improvements, so that the corridor problem statement can be modified as required. Second, it confirms or modifies the priority assigned to the planned or programmed improvement. Third, it facilitates coordination of improvement actions between corridors; for example, at intersections which connect two or more corridors.

Step 4 is to identify and evaluate Alternative Improvement Actions. These are candidate improvements in the areas of traffic control, roadway geometrics, and network operations which address the problems identified in Step 2, as modified in Step 3. Various actions are evaluated accord-

ing to the criteria defined below, ranked in order of preference based upon relative cost-effectiveness, and screened to select the most feasible options.

Step 5 is to organize the feasible actions into a Recommended Corridor Improvement Plan. Consideration is given to the relationships between various corridor plans to avoid either duplication or "missing links." Also, comparisons are made between tentative corridor plans to identify common projects or actions which merit special priority because of significant potential effects. Specific actions in the corridor improvement plan are listed in priority order and described; cost estimates are provided; potential benefits and impacts are projected; and special considerations (e.g. relationship with other actions, phasing, testing) are noted.

1.5 Evaluation Criteria and Standards

Generally the traffic impacts described in the EPTR-T are of a short term nature (5 years +/-) and relatively minor at the overall system level. A population increase, and related growth of traffic volume, on the order of 4 percent is projected as attributable to the Peacekeeper project. However, localized traffic impacts are expected to be moderate to severe at certain locations, under peak period traffic demands. The overall emphasis of this study is on traffic operations and management measures, minor geometric modifications, and limited construction. Only a few instances appear to warrant major construction investments.

Evaluation criteria used in the study reflect this emphasis. The following factors were applied, as appropriate, in the identification, evaluation and selection of recommended actions.

- Cost, including both initial implementation cost and subsequent direct maintenance/operation costs.
- Level of service changes, as measured by volume/capacity ratios.
- Flexibility, or the extent to which an action can be modified, adjusted or replaced.
- Disruption, including both short term or construction inconvenience, and long term or permanent displacement/relocation.
- Safety considerations, or estimates of potential changes in accident/incident rate and severity.
- Simplicity, or ease of understanding to the average motorist, both regular users and occasional users.
- Network relationship, the extent to which an action relates to and reinforces the identified arterial system.
- Physical environmental effects, such as visual/aesthetic impact, effect on planted/landscaped areas, and other obvious consequences were considered. Small scale effects such as changes in noise level, energy

consumption and the like were not quantified, since overall system levels of traffic are constant between various options.

The level of detail at which the various actions are described is preliminary and conceptual, but sufficient to verify the technical feasibility of the project. Further, none of the recommended actions have been subjected to formal public or implementing agency review. To the extent possible, obvious problems of institutional feasibility have been avoided.

2. CORRIDOR ANALYSES

This section summarizes the analyses for each of the 13 identified corridors, generally following the format described in the preceding section. For each corridor, a strip map (one or more sheets, depending upon the length of the corridor) at a scale of 1" = 200' is presented. These maps locate significant features and locations of concerns. The strip maps have match lines (e.g. "A-A") and north arrows for orientation, and cover an approximately 600 ft. band along each corridor.

Credit is given to the Cheyenne Area Transportation Planning Process for making available the aerial base maps used to prepare the strip maps. The aerial maps were obtained as part of a project funded by a Department of Defense 801 Planning Grant.

2.1 PERSHING BOULEVARD - F.E. Warren AFB to Converse

2.1.1 Existing Conditions

Pershing Boulevard is classified as a principal arterial. The west 0.6 mile of Pershing Boulevard from Warren AFB to Pioneer Avenue has one lane in each direction. On-street parking is permitted throughout this section except for 1 block on the south side (McComb Avenue to I-25) and 1 block on the north side (Thomes Avenue to Pioneer Avenue). Road width is 45 ft. in an 80 ft. right-of-way. Land use is residential except near Snyder Avenue and Pershing Boulevard, where there is some commercial development. The commercial development generates significant traffic because of the high turnover land use (fast food restaurant and discount gas station). Speed limit throughout this section is 30 mph. There are traffic signals at Randall Avenue and Snyder Avenue. Both signals operated as two phases and are traffic actuated. The intersection of Pershing Boulevard and Snyder Avenue experienced 13 accidents from 1981 through 1983 (1981 - 6, 1982 - 4, 1983 - 3). Traffic exhibits pronounced peak direction characteristics, westbound in the morning and eastbound in the evening. West of Snyder, for example, the directional split in the a.m. is 38% EB, 62% WB; in the p.m. it is 60% EB, 40% WB. Evening volumes are about 50% greater than morning, with the p.m. peak equal to about 10% of ADT.

East of Pioneer Avenue to Alexander Avenue, for approximately 1.1 miles, Pershing Boulevard has 2 lanes in each direction. No on-street parking is allowed throughout this section except for a few spaces at certain commercial areas (e.g. Hoys Drug Store). Road width is 45 ft. in an 80 ft. right-of-way. Land use is mostly residential near the cross streets of Duff Avenue and Alexander Avenue, where there are fast food restaurants and other developments which generate significant traffic. Speed limit throughout this section is 30 mph. There are traffic signals at Carey Avenue (traffic actuated), Central Avenue (pre-timed), Warren Avenue (pre-timed), Evans Avenue (traffic actuated) and Duff Avenue (traffic actuated). All signals operate as two phase. Accidents reported at major locations for three years are:

- Pioneer Avenue - (1981 - 3, 1982 - 2 or less, 1983 - 3)
- Carey Avenue - (2 or less accidents per year)
- Central Avenue - (1981 - 15, 1982 - 11, 1983 - 10)

- ° Warren Avenue - (1981 - 1582 - 17, 1983 - 12)
- ° Evans Avenue - (1981 - 9, 1982 - 4, 1983 - 6)
- ° Morrie Avenue - (1981 - 3, 1982 - 2 or less, 1983 - 4)
- ° Duff Avenue - (1981 - 6, 1982 - 5, 1983 - 7)

East of Alexander Avenue to Rayer Avenue, for approximately 0.5 miles, Pershing Boulevard has 5 lanes (2 lanes in each direction with a center left turn lane) and no on-street parking. Road width varies within the 80 foot wide right-of-way. Two major generators in this section which contribute significant traffic volume: a major shopping area north of Pershing Boulevard and west of Concord Road, and Carey Junior High School, north of Pershing Boulevard and east of Concord Road. Speed limit in this area is 30 mph except for the 20 mph limit in front of Carey Junior High School during certain hours. There are actuated traffic signals at Logan Avenue/Concord Road and Rayer Avenue. The Logan Avenue/Concord Road intersection is offset and has an actuated exclusive pedestrian phase. Traffic on Concord Road and Logan Avenue also actuates this signal, which can display up to four phases. At Rayer Avenue, there is an actuated pedestrian phase for children crossing Pershing Boulevard. Traffic from Rayer Avenue also actuates this signal. Accidents reported at major locations are:

- ° Alexander Avenue - (1981 - 3, 1983 - 2 or less, 1983 - 3)
- ° Logan Avenue - (1981 - 6, 1982 - 7, 1983 - 2 or less)
- ° Rayer Avenue - (2 or less per year)

East of Rayer Avenue to Converse Avenue, for approximately 0.4 mile, Pershing Boulevard has 2 lanes in each direction and no on-street parking. Roadway width is 45 ft. in an 80 ft. wide right-of-way. Land use is residential and the speed limit is 30 mph. There is a traffic signal at Converse Avenue. This pre-timed signal operates with two phases and controls three approach lanes and two exit lanes on the east side. At Converse there were 18 accidents in 1981, 23 in 1982 and 7 in 1983. This intersection was reconstructed between 1982 and 1983, contributing to the lower accident rate.

2.1.2 Traffic Operations Problems

Between Warren AFB and Pioneer Avenue there are two problem locations. At the cloverleaf interchange and Randall Avenue intersection the awkward geometrics and the sharp angle by which Randall Avenue intersects Pershing cause conflicts between traffic movements. On I-25, the cloverleaf ramps have tight turns and between-ramp weaving conflicts occur on the Interstate. This location is adjacent to the Air Force Base main gate where base-related traffic often caused delay and congestion. Entering traffic sometimes is stacked up past the intersection of Snyder Avenue and Pershing Boulevard. On the north side of this intersection (NB to I-25), the on ramp connects with local streets, where confusing geometrics and differences in speeds between vehicles creates a hazard.

The second location is at Snyder Avenue where there is commercial development on three of the four corners. Each of the commercial developments generate significant volumes of traffic during peak hours. In addition, access drives serving the commercial developments are too

close to the intersection. During the peak hours there are conflicts between through traffic and vehicles making left turns into these driveways. Another problem at this intersection is delay caused by vehicles making left turns, since there are no separate left turn lanes on Pershing Boulevard or Snyder Avenue. Left turning vehicles block the through lane forcing through traffic to wait or go around.

One of the major problem areas on Pershing Boulevard is the section from Central Avenue to Evans Avenue, including the signalized intersection of Warren Avenue. This section serves a large volume of traffic (over 12,000 ADT, 1,200 vph in p.m. peak) but lacks sufficient capacity. During peak hours there are delays and traffic back-ups caused mainly by left turners at Evans northbound and southbound, Warren Avenue northbound and southbound to 30th Street, and Central Avenue southbound.

There are no separate left turn lanes on Pershing Boulevard so the inside through/left lane is usually blocked because of opposing traffic. During the evening peak hour, southbound left turning traffic backs up onto Central Avenue because of congestion at Warren Avenue and Pershing Boulevard.

The valley pan on Warren Avenue (north approach) forces vehicles to slow down and reduces capacity. During the morning peak hour, traffic backs up westbound because of left turns onto 30th Street at Warren Avenue. This five legged intersection is confusing and should be eliminated. On the north leg of Evans Avenue southbound left turns are delayed by opposing traffic.

The intersection of Duff Avenue and Pershing Boulevard experiences problems with left turning traffic with no left turn lanes. The left turning traffic blocks the inside lane while waiting for gaps in opposing traffic. There are also conflicts with on-street parking at Hays Drug Store with traffic on Pershing Boulevard.

At Carey Junior High School, during the a.m. and p.m. peak school hours, there is congestion. During the a.m. peak school hours in the area near Rayer Avenue there are conflicts between faculty accessing the parking lot, students being dropped off, pedestrians crossing at the signalized school crosswalk and the left turns in the eastbound direction. There is also a sight distance problem because of the grade to the east. During the evening school peak hour, there is congestion caused by parents waiting to pick up their children. Even though a pick up area has been constructed, it fills up and parents will illegally park on Pershing Boulevard. Vehicles parking on Pershing Boulevard block the outside through traffic lane.

2.1.3 Planned/Programmed Improvements

The existing interchange of Randall Avenue/Pershing Boulevard with I-25 is scheduled for reconstruction as a diamond interchange. This project is scheduled to be undertaken by WHD in 1986. Better ramp/ street intersections are expected to improve traffic flow in the immediate vicinity of the interchange, but constrictions on Pershing Boulevard to the east will remain.

The intersection of Morrie Avenue with Pershing Boulevard is scheduled at some future date (1988 or later) as a City project. This intersection upgrading should reduce a localized bottleneck on Pershing Boulevard as well as improve north-south traffic flow.

2.1.4 Alternative Improvement Actions

Increasing the level of service along Pershing Boulevard could be accomplished by a combination of increasing capacity and reducing demand. Capacity increases can be realized by spot intersection improvements and by major roadway widening, both of which are included in the recommended plan. Reducing demand includes two different strategies. One is to provide alternate routes, the primary one being in improved 19th/20th Street corridor; this strategy is discussed in Section 2.4. Potential benefits to Pershing are relatively modest, but the diversion potential increases as the location in question moves east. For example, in the section of Pershing west of Pioneer/Carey, only a small percentage of trips (1-3%) might use 19th/20th. However in the section between Evans and Morrie, perhaps 8-10% of trips might divert.

The second strategy to deal with demand on Pershing addresses Warren AFB traffic. The main base gate is on Pershing west of I-25. A study was made to determine the composition of traffic on Pershing and other locations during peak periods (see Appendix A for details). General findings of this study were:

- ° In the p.m. peak, Warren AFB related traffic represents about 59 percent of eastbound traffic west of Central, and about 16 percent of traffic west of Logan.
- ° In the a.m. peak, Warren AFB related traffic represents about 34 percent of westbound traffic west of Central, and about 16 percent of traffic west of Logan.

Because of the military nature of this major traffic generator, "employer-sponsored" TSM type actions have a high probability of success. Unlike general civilian traffic, which exhibits widely varying behavior (trip purpose/destination/time of day) and which is largely free to choose routes, military base traffic is both predictable and controllable. It is strongly recommended that local officials continue to work with the Warren AFB Command to assess the feasibility of relocating the major base access to another point -- probably Missile Drive. The potential benefits to general traffic are large, the alternate routes to Missile Drive are available, and the implementation procedures are easy. Technically this action appears to be very cost-effective; the institutional and political feasibility is not so clear-cut, but should be pursued.

2.1.5 Recommended Improvement Plan

Widening Pershing to four lanes would require extensive construction and probably removal of trees along the west end of the corridor. This should be considered as a long range action. However, the section from

west of Central to east of Warren should be widened to a five lane section (two through each way plus center left turn lanes) to improve capacity and facilitate movement to the north-south one way pair. As part of this, the access to 30th Street from Pershing should be closed. (See also Section 2.2.5).

The approaches to Evans are also strong candidates for widening to develop two through lanes each way plus left turn lanes. As part of this the curb radii should be enlarged to improve right turn movements.

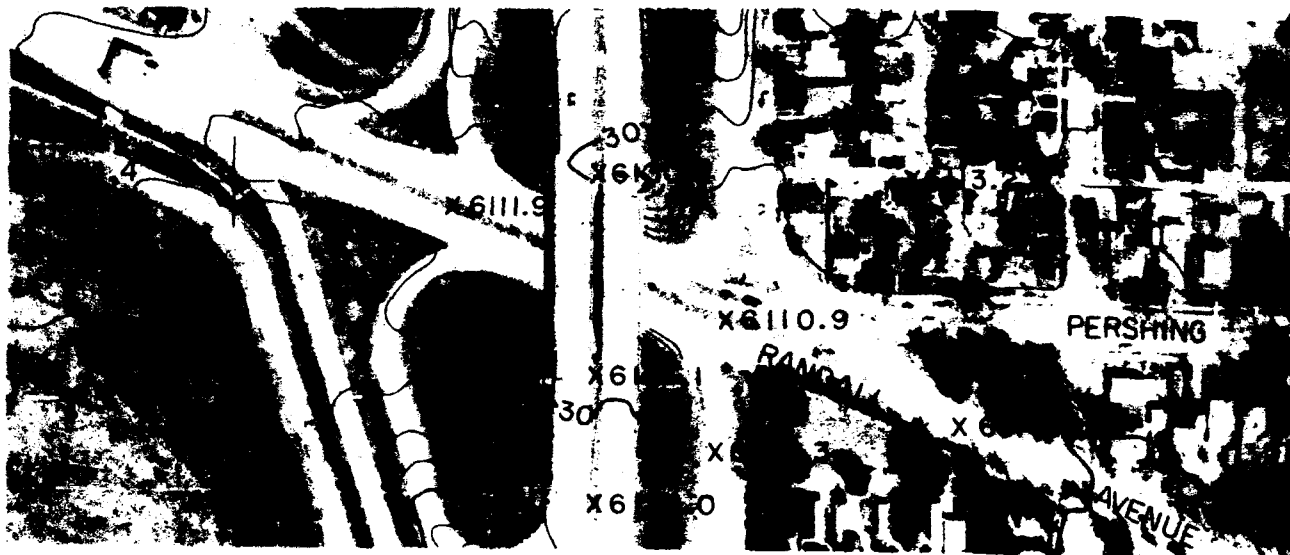
Morrie Avenue is designated a minor arterial on the functional classification plan. Improvements to this corridor require realignment of Morrie north and south of Pershing. The improved intersection should have five lane approaches in all legs, and the five lane section of Pershing which exists east of Morrie should be continued west to Evans.

Control of cross-street and driveway access should be emphasized, particularly on the section east of Morrie where diagonal street intersections on the south side create awkward geometrics.

The parking lot exit drive east of Carey Junior High School should be closed, and the confusing stop sign removed, to reduce turning conflicts and pedestrian/vehicle conflicts.

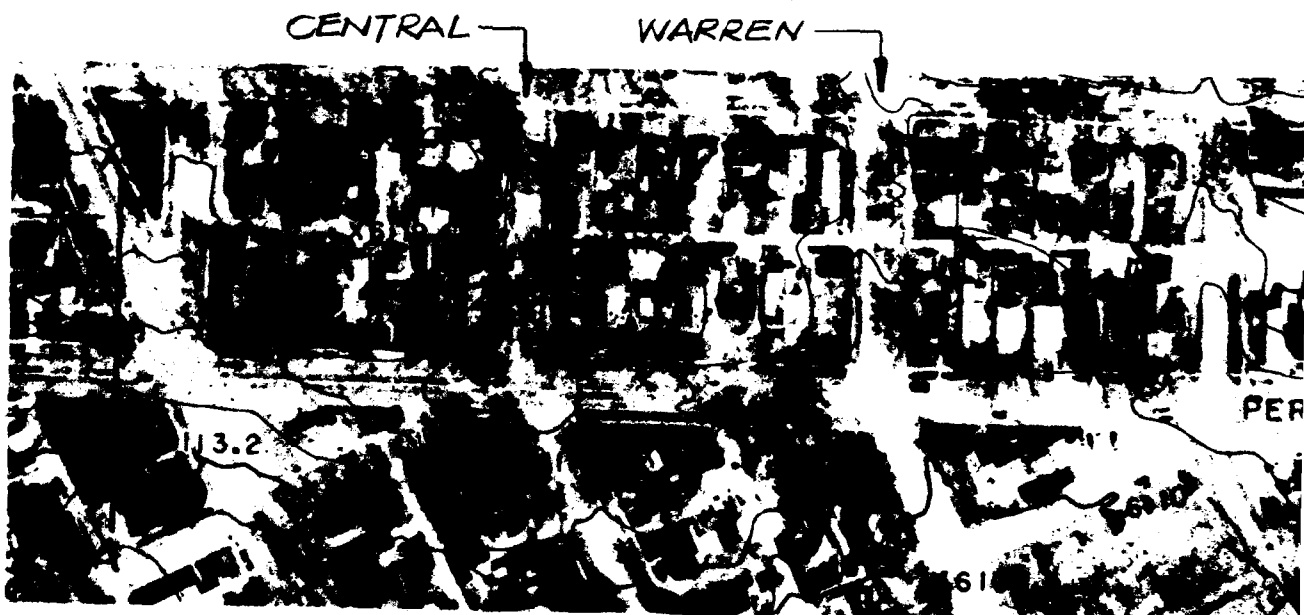
The Pershing/Converse/19th Street intersection, which was recently reconstructed, should be monitored (periodic turning movement counts, review of accident reports) to insure that signal timing and phasing match traffic demand. Proposals for new access points in this vicinity should be critically reviewed and approved only when no other alternative is reasonably available. This intersection serves two minor arterials and one principal arterial, a difficult demand even without the added conflicts caused by local traffic to and from commercial generators.

①



INTERCHANGE PROGRAMMED
FOR RECONSTRUCTION TO
DIAMOND IN 1987

RO.
INC



WIDEN TO 4L PLUS LT,
APPROACH/EXIT TAPERS
BETWEEN CENTRAL & WARREN
CLOSE 30TH/PERSHING
(SEE FIGURE 2.8)

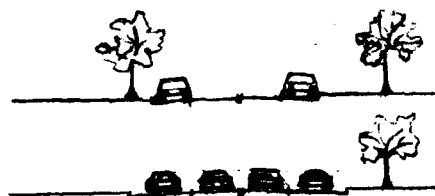
ADT 12,300



REQUIRED TO
PERSHING;
THROUGHOUT
IN R.O.W.
OF TREES)

ADT 7,000

SNYDER



2 LANE W/ PARKING (EXISTING)

4 LANE WITHOUT PARKING



EVANS

CH WIDENING
AT EVANS

A-Professional Corporation

ARIX

Engineers Architects Planners

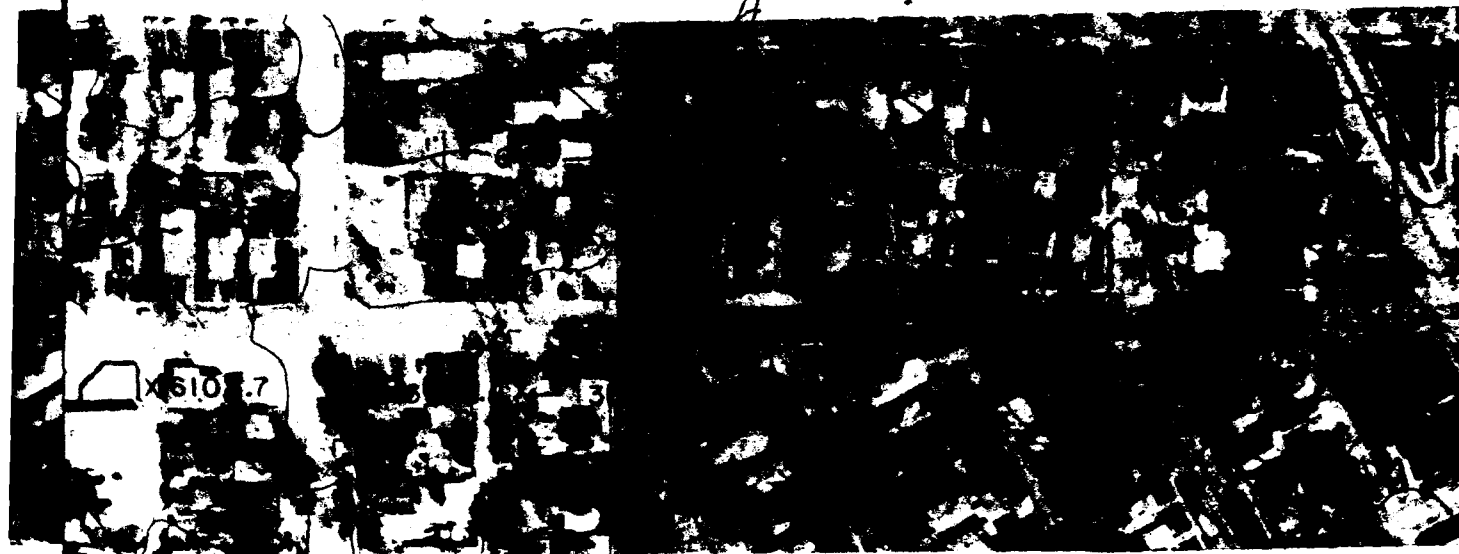
Greely, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Glen, Utah

CHEYEN

CORP

P.E.N

1-200



WYOER



2 LANE W/ PARKING (EXISTING)



4 LANE WITHOUT PARKING



IM
R
EN

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR I - PERSHING BOULEVARD

F.E. WARREN A.F.B. TO CONVERSE

1" = 200'

I A

DECEMBER, 1984



ADT { ← 9,200W — MORRIE
E 8,100 →

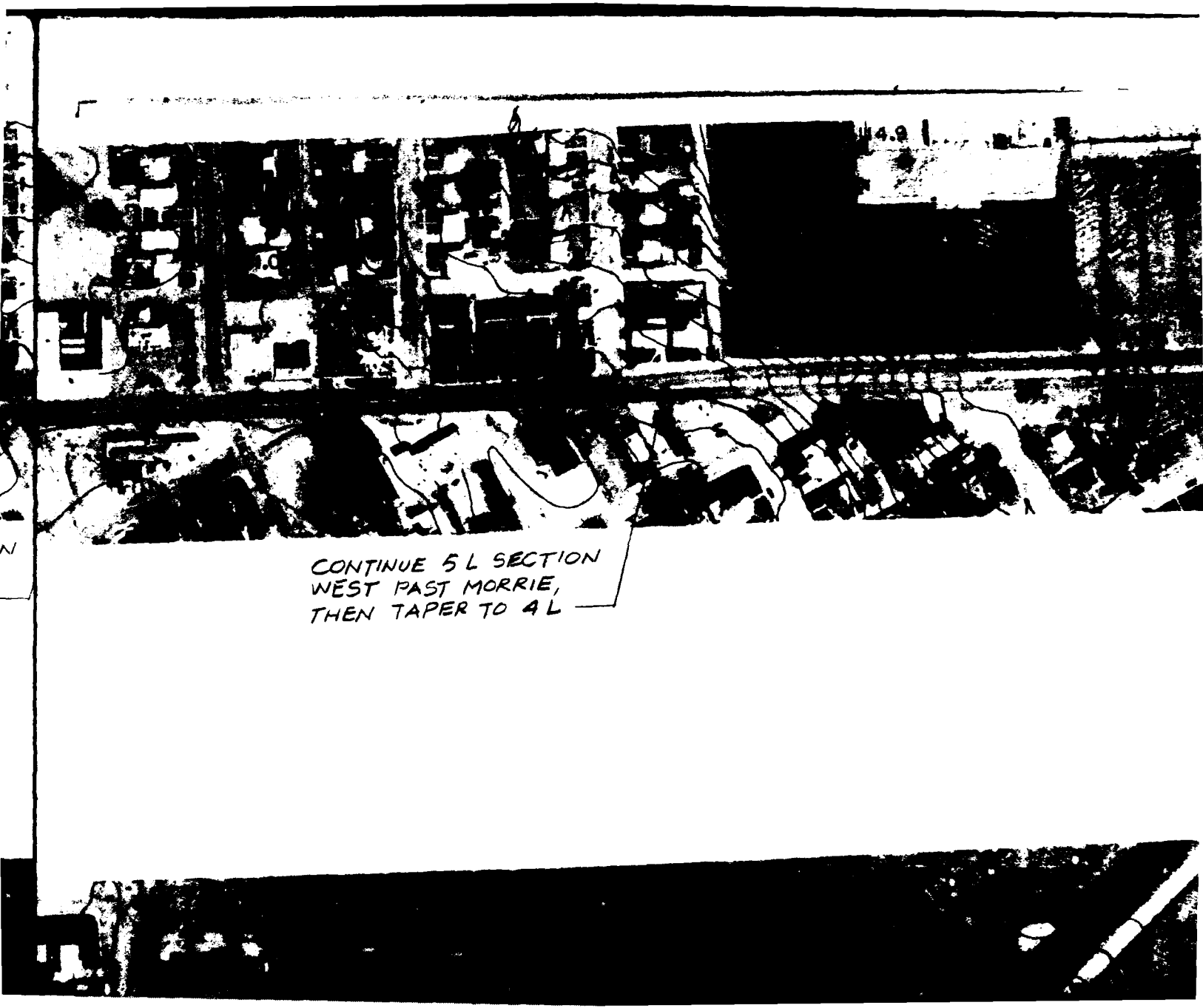
REALIGN MORRIE ACROSS
PERSHING TO CONTINUE
NORTH OF PERSHING

CONTINUE 5 L SEC
WEST PAST MORRIE
THEN TAPER TO 4



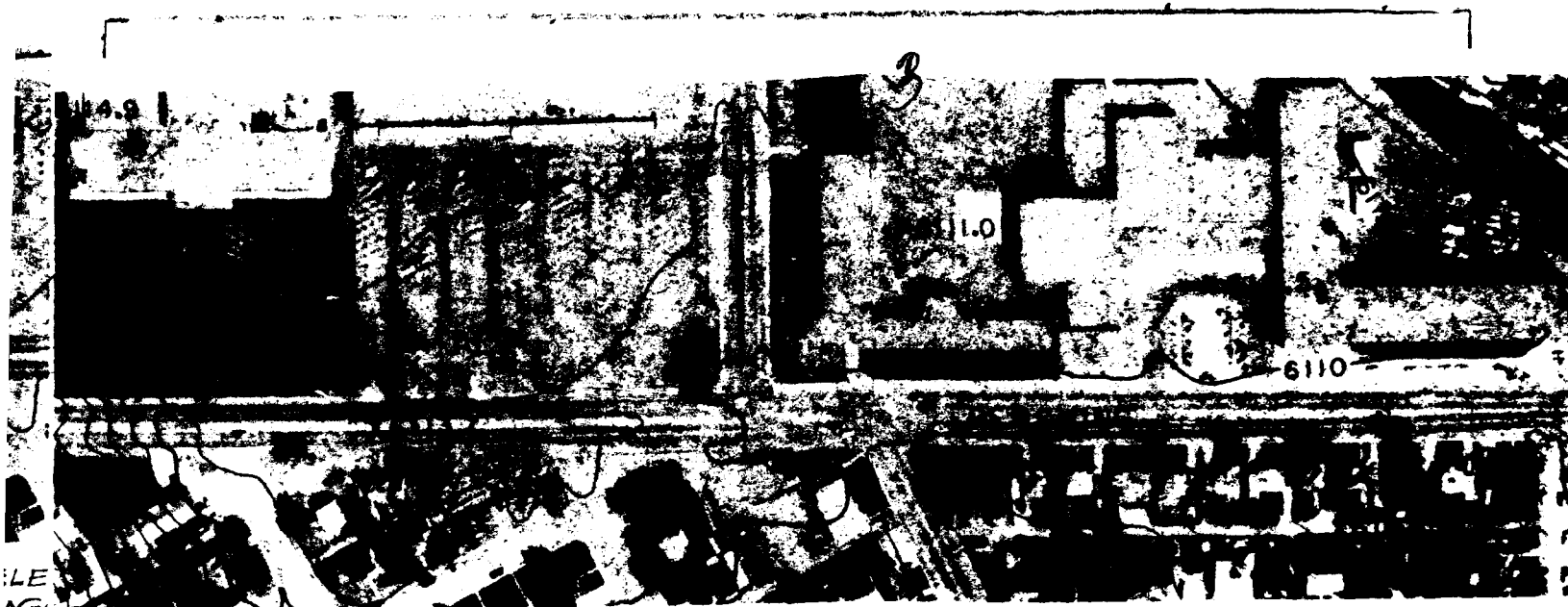
ADT { ← 5,800W
E 6,500 →

EXTEND CONVERSE N.B. W/2 LANES
PAST V.A. HOSPITAL ACCESS



N

CONTINUE 5 L SECTION
WEST PAST MORRIE,
THEN TAPER TO 4 L



LE
AG
UTH
IN

SELECTIVE CLOSURE OF
DIAGONAL CROSS-STREETS,
SOUTH SIDE OF PERSHING
TO IMPROVE ACCESS CONTROL



7.1

VIRE OF
 - STREETS,
 - CRSHING
 FI
 TC SS CONTROL
 ST
 RE
 CC

CLOSE ACCESS DRIVE
 FROM SCHOOL PARKING LOT
 TO PERSHING TO REMOVE
 STOP SIGN/SIGNAL CONFLICT,
 REMOVE SIDE STREET TRAFFIC
 CONFLICT WITH RAYOR/DRIVEWAY

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
 Grand Junction, Colorado
 Riverton, Wyoming
 Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR I - PERSHING BOULEVARD

F. E. WARREN A.F.B. TO CONVERSE

1" = 200'

I B

DECEMBER, 1984

2.2 YELLOWSTONE/CENTRAL-WARREN - Prairie to College Drive

2.2.1 Existing Conditions

The Yellowstone/Central-Warren corridor, continuing south on I-180 and South Greeley Highway, in a principal arterial and serves as the major north-south route through downtown Cheyenne.

The north section, from Prairie to 8th Avenue, includes Yellowstone Road and Central Avenue. Yellowstone is a four lane, median divided street with good channelization, wide lanes and wide shoulders. The approach to Central Avenue is channelized to permit one right turn lane, northbound on Central, and double left turn lanes, southbound on Central. Signals control the intersections at Prairie, Central and 8th Avenue. Central north and south of Yellowstone is a four lane median divided street with wide lanes and shoulders. Approaching 8th Avenue arterial divides with the southbound lanes continuing south, and the northbound lanes connecting from Warren Avenue.

Reported accidents in this section of the corridor are:

- Prairie/Yellowstone - (1981 - 9; 1982 - 4; 1983 - 12)
- Yellowstone/Central - (1981 - 13; 1982 - 12; 1983 - 15)
- Central-Warren/8th Avenue - (1981 - 8; 1982 - 10; 1983 - 18)

The Central-Warren one way pair continues south from 8th Avenue to Lincolnway, Central Avenue has two lanes plus parking. At Pershing, Central turns half left continuing on the north-south diagonal direction of CBD streets. Signals are provided at Pershing, 24th, 20th, 19th, 18th, 17th and 16th Streets. Between 20th and 19th the section widens to three lanes, with parking on both sides.

Warren Avenue from Lincolnway north to 8th Avenue has two lanes and parking on both sides. Signals are provided at Lincolnway, 17th, 18th, 19th, 20th, 24th Streets and Pershing. Crossing Pershing Warren makes a half-right turn to the north.

Reported accidents in this section of the corridor are:

Central Avenue:

- Pershing - (1981 - 15; 1982 - 11; 1983 - 10)
- 24th - (1981 - 5; 1982 - 6; 1983 - 6)
- 21st - (1981 - 2 or less; 1982 - 2 or less; 1983 - 3)
- 20th - (1981 - 10; 1982 - 3; 1983 - 10)
- 19th - (1981 - 4; 1982 - 10; 1983 - 5)
- 18th - (1981 - 2 or less; 1982 - 3; 1983 - 6)
- 17th - (1981 - 6; 1982 - 4; 1983 - 5)
- 16th - (1981 - 21; 1982 - 11; 1983 - 14)

Warren Avenue:

- 16th - (1981 - 6; 1982 - 7; 1983 - 24)
- 17th - (1981 - 6; 1982 - 6; 1983 - 3)
- 18th - (1981 - 4; 1982 - 2 or less; 1983 - 2 or less)

- ° 19th - (1981 - 2 or less; 1982 - 5; 1983 - 7)
- ° 20th - (1981 - 12; 1982 - 8; 1983 - 9)
- ° 21st - (1981 - 2 or less; 1982 - 2 or less; 1983 - 6)
- ° 26th - (1981 - 2 or less; 1982 - 6; 1983 - 4)
- ° Pershing - (1981 - 15; 1982 - 17; 1983 - 12)

The corridor continues south over the new viaducts on the I-180 extension from I-80, then becomes U.S. 85 or the South Greeley Highway, which continues south to the Colorado State line. The new viaducts carry two lanes in each direction; Central southbound has a merging lane from Lincolnway and Warren northbound has a separate right turn lane to Lincolnway. The viaducts touch down near 9th Street and I-180 continues as a four lane median divided roadway with signals at 9th Street, 5th Street and the I-80 ramp terminals south of I-80. U.S. 85 is a four lane highway with a center left turn south past College Drive. Signalized intersections include Fox Farm Road and College Drive.

Reported accidents in this section of the corridor are:

- ° 9th Street - (1981 - 8; 1982 - 7; 1983 - 9)
- ° 5th Street - (1981 - 14; 1982 - 14; 1983 - 10)
- ° I-80 - (1981 - 2 or less; 1982 - 2 or less; 1983 - 3)
- ° Fox Farm Road - (1981 - 10; 1982 - 15; 1983 - 14)
- ° College Drive - (1981 - 7; 1982 - 11; 1983 - 2)

2.2.2 Traffic Operations Problems

The section of Yellowstone between Central and Prairie experiences heavy weaving conflicts between traffic from northbound Central continuing north past Prairie - *merging left* - and traffic from southbound Central turning left - then merging right to turn right at Prairie. The weave is aggravated by the fact that right turning traffic from Central travels quite a bit faster than the left turning vehicles who must negotiate a 150 degree turn. A lane use control sign was recently installed at the merge point to clarify available lanes -- it is really not necessary for northbound through traffic to change lanes, but the left turning traffic from Central does have to move right two lanes in order to turn at Prairie.

The Yellowstone/Central intersection problem is simply one of excess demand -- a recent count by WHD indicates over 30,000 ADT through the intersection, with p.m. peak volumes of over 3,100 vehicles per hour moving through the intersection. Daily demand is split approximately 24 percent Central southbound, 40 percent Yellowstone southbound and 36 percent Central northbound. The southbound Central left turn is about 14 percent of the total volume (56 percent of this approach); southbound Yellowstone left turn is 26 percent of total volume (65 percent of this approach); northbound Central right turn is 27 percent of total volume (76 percent of this approach). As presently constructed, the intersection is not configured to serve the major demands - over half of the daily demand is represented by the southbound left turn from Yellowstone to Central and the northbound right turn from Central to Yellowstone.

At 8th Avenue the Warren northbound approach is marked for two lanes, but actually operates as a three lane approach with drivers forcing to one side or the other. Turns to and from 8th Avenue are not clearly laid out, and the fact that Warren and Central are both one way streets is not clearly marked.

Traffic northbound on Evans turns on to 8th Avenue, weaves right, and enters Central northbound via an exclusive right turn lane. The yield control here is not effective.

Both Central southbound and Warren northbound approaches to Pershing are awkward due to the relatively narrow lanes, heavy turning volumes and offset exit approaches. Left turns from Central and Warren onto Pershing are constricted by traffic on Pershing which stops too far into the intersection. Right turns from Warren to Pershing are restricted by the 120 degree turn and sharp radius.

Central and Warren through the CBD function reasonably well, although cross-street sight distances are often restricted by vehicles parked too close to intersections. Cross-street traffic turning from a stop sign or making a right turn on red cannot see approaching traffic well, thus creating a conflict.

On I-180 between the viaducts and I-80, travel speeds are excessive, due in part to the perceived high type roadway. The proximity of Central and Warren to I-180 and the relatively long travel path across I-180 further aggravates the situation. The problems appear to stem primarily from poor driver behavior, as the geometrics and control are satisfactory.

The South Greeley Highway, south of I-80, has numerous driveways and minor cross street access points which create conflicts between through traffic and traffic either slowing to turn right/left or traffic entering the highway. Problems at the intersections of Fox Farm Road and College Drive relate primarily to the cross-street traffic; north-south flow is satisfactory.

2.2.3 Planned/Programmed Improvements

No major projects are being considered along the corridor. The WHD is continuing to refine the signal timing at Yellowstone/Central to improve flow, and is considering a project to extend the southbound left turn lane on Central back to provide adequate storage for left turning vehicles, which now block the inside through lane southbound during peak periods.

2.2.4 Alternative Improvement Actions

Mainline corridor capacity is adequate for the near term, and the areas of increased future demand, especially through the CBD, are constrained as to the level of improvement. Parking removal is probably not feasible or warranted along Central or Warren.

At the Yellowstone/Central intersection, consideration should be given to reconstructing the intersection to give priority to the major demands. This would involve realigning Central north of the intersection to become the stem of the tee, with continuous two lane flow northbound Central to Yellowstone and southbound Yellowstone to Central. Additional right-of-way would be required in the northwest quadrant, from land which is now park/open space.

2.2.5 Recommended Improvement Plan

Control of access should be aggressively maintained throughout the corridor, from Yellowstone north to the South Greeley Highway. The corridor needs to be preserved as a principal arterial route serving long distance trips, and should not be hampered by nuisance drive-ways, curb cuts and awkward intersections with local streets.

In addition to implementing the left turn lane extension on Central southbound, and adjusting signal timing to meet changing demands during the day (e.g. a.m., p.m. and off-peak settings), the trend in traffic volume growth should be monitored on Yellowstone/Central. If the present prioritization of demands continues, then reconstruction to favor primary demands should be considered. The forthcoming urban area transportation plan update should help to confirm this, as well as other demand trends throughout the arterial network.

Improvements to the Pershing intersections including left turn lanes on Pershing between Warren and Central, and closure of 30th Street, are recommended.

The Warren approach to 8th Avenue should be signed and marked for left plus through, through only, and right only lanes.

Overhead lane use control signs at signalized intersections in the CBD, and removal of parking spaces adjacent to cross street intersections should be implemented. Pedestrian signals should be upgraded along this corridor and throughout the CBD.

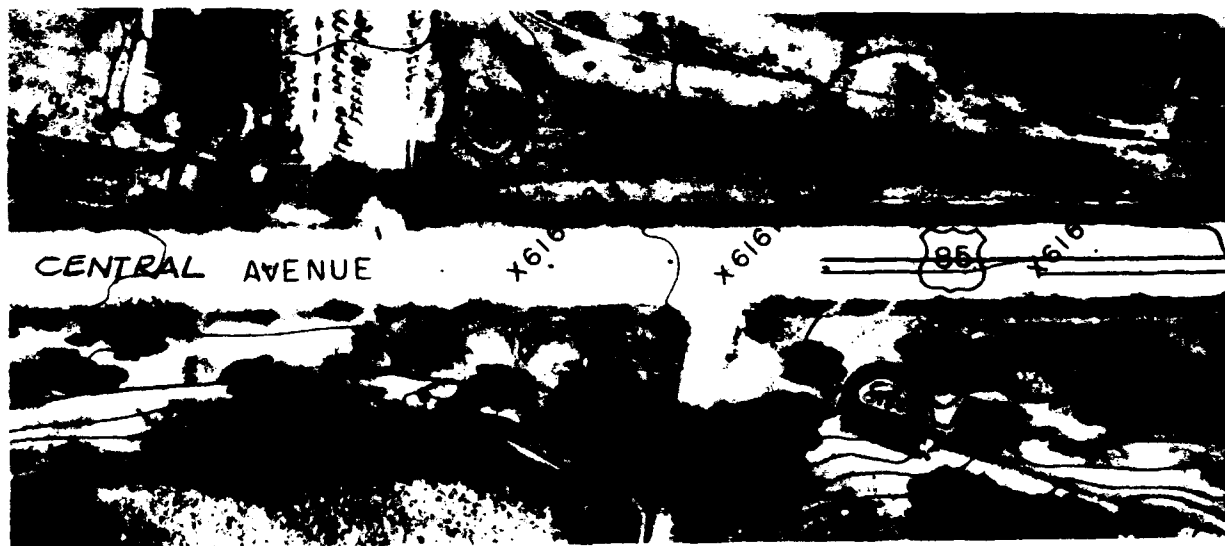
Recommendations to improve the Fox Farm Road intersection are presented in Section 2.8.5, and suggestions for the College Drive intersection are discussed in Section 2.11.5. These will improve north-south flow as well as alleviate the more severe east-west problems.



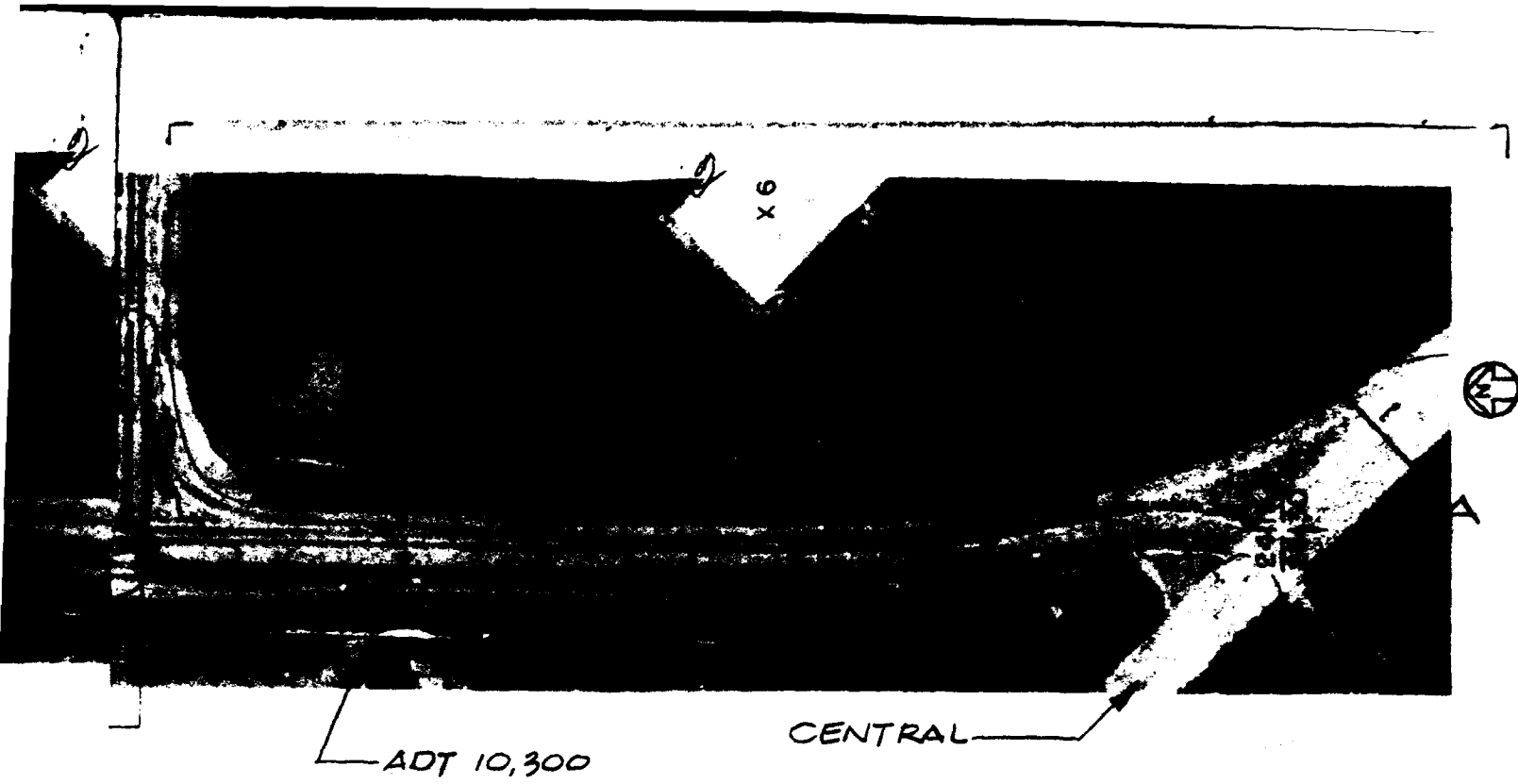
PRAIRIE

ADT 10,300

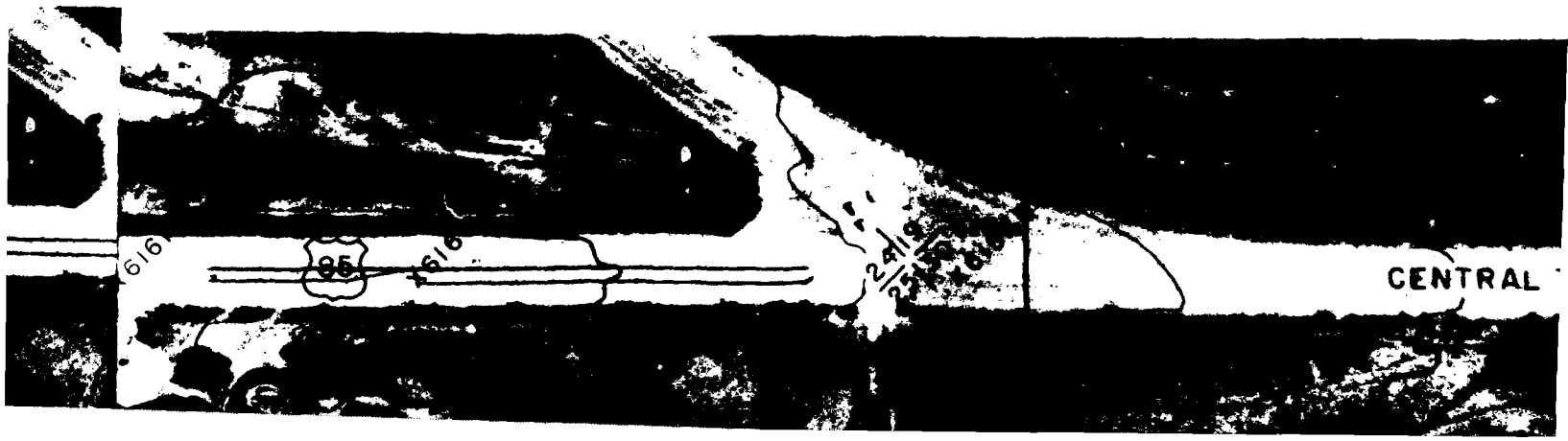
CONTROL ACCESS ON YELLOWSTONE
NORTH, CONSOLIDATE DRIVEWAYS,
USE SIDE STREET ACCESS



EXTEND LT LANE CENTRAL TO YELLOWSTONE



STONE
AYS,



WEAVER
LLOWS
LLOW
IBLE
LLOWS
TERNAT
LLOWS
DITION



CENTRAL

WEAVER³ CONFLICT N.B. CENTRAL TO N.B. YELLOWSTONE AND S.B. CENTRAL TO N.B. YELLOWSTONE, BOTH TO PRAIRIE, ADDING DOUBLE LT. OR DOUBLE RT. OR 3 LANES ON YELLOWSTONE WOULD AGGRAVATE CONFLICT

ALTERNATE FUTURE LAYOUT EMPHASIZES YELLOWSTONE/CENTRAL, REQUIRES ADDITIONAL R.O.W.

YELLOWSTONE

CENTRAL

LICIT N.B. CENTRAL TO N.B.
AND S.B. CENTRAL TO N.B.
BOTH TO PRAIRIE. ADDING
DOUBLE R.T. OR 3 LANES ON
WOULD AGGRAVATE CONFLICT

RE LAYOUT EMPHASIZES
CENTRAL, REQUIRES
O.W.

YEL

CENTRAL

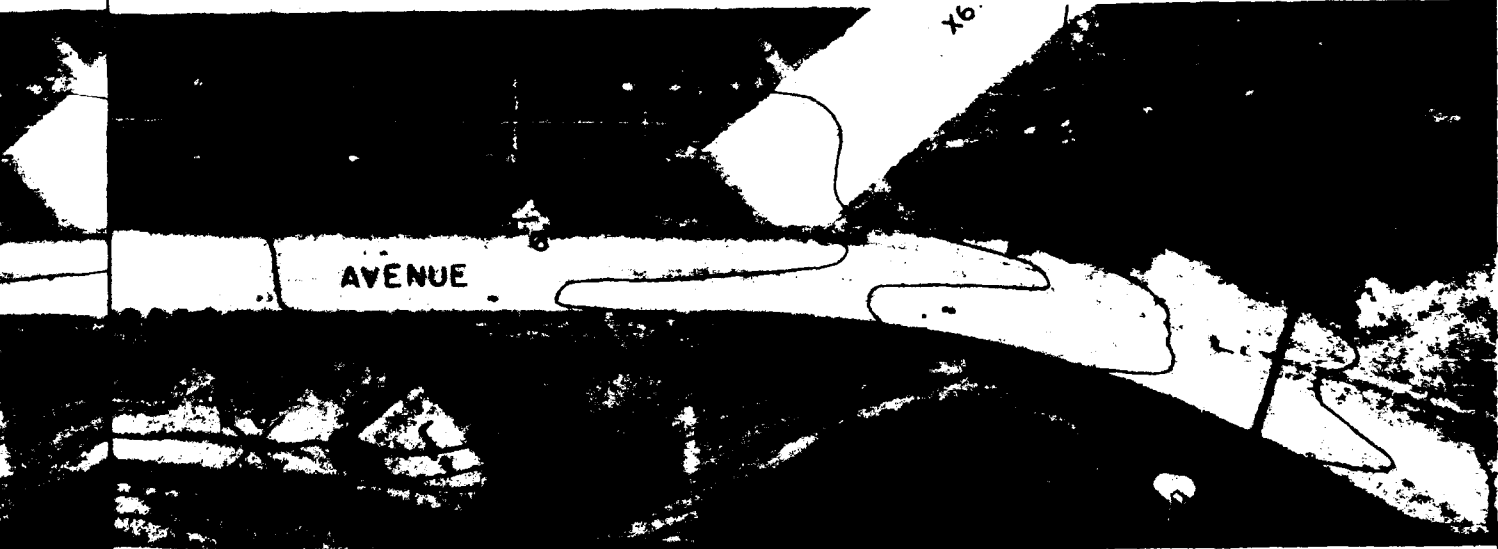
7,870
YELLOWSTONE
4,200

1983 WHD
ADT COUNT

4,170
3,160
CENTRAL

8,240
2,660

1983
ADT C



CHEYEN

CORRIDO

R

200'

A Professional Corporation

ARIX

Engineers Architects Planners

Greely, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Ogden, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 2 - YELLOWSTONE/CENTRAL-WARREN

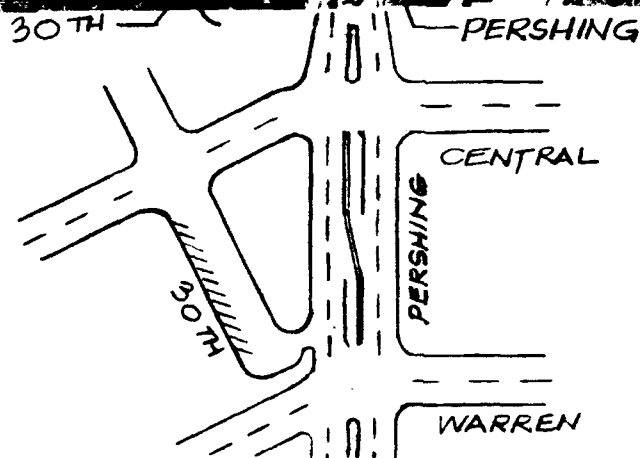
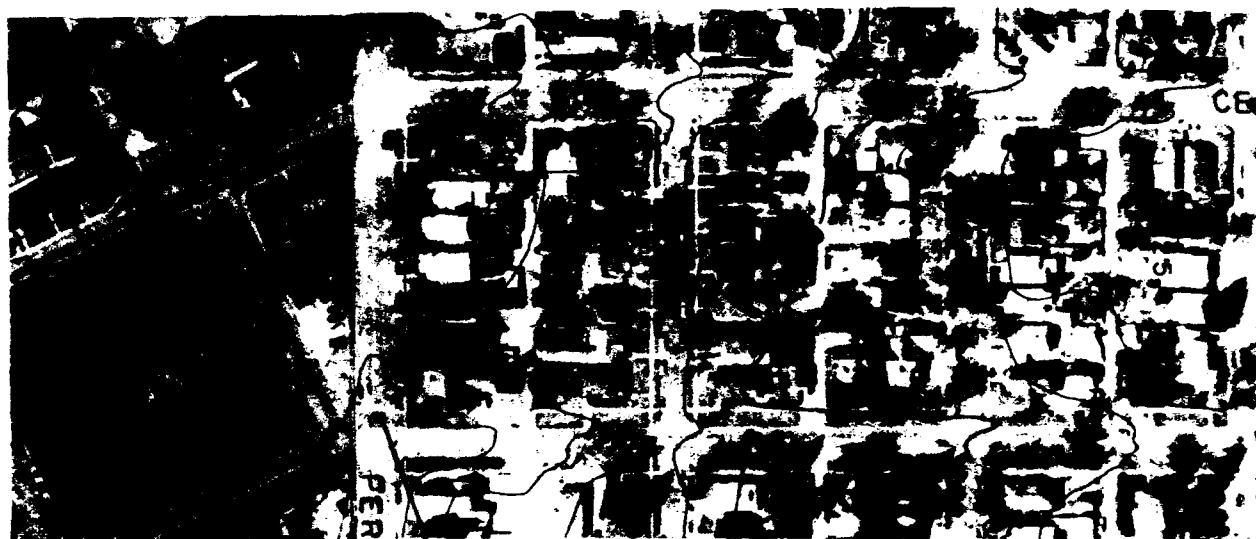
PRAIRIE TO COLLEGE DRIVE

1" = 200'

2 A

DECEMBER, 1984

①



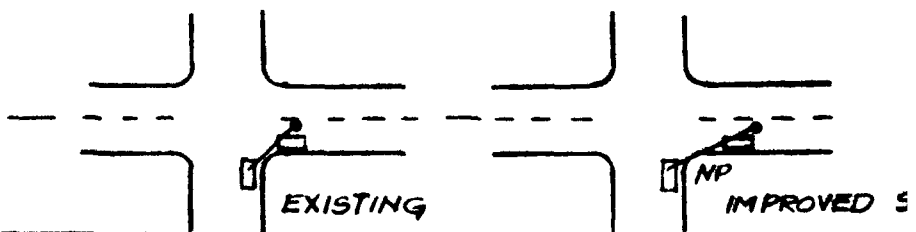
- CLOSE 30TH AT PERSHING / PARKING STREET WITH ACCESS
- WIDEN PERSHING, WARREN LT LANES
- OVERHEAD LANE CONTROL ARMS AT SIGNALIZED INT

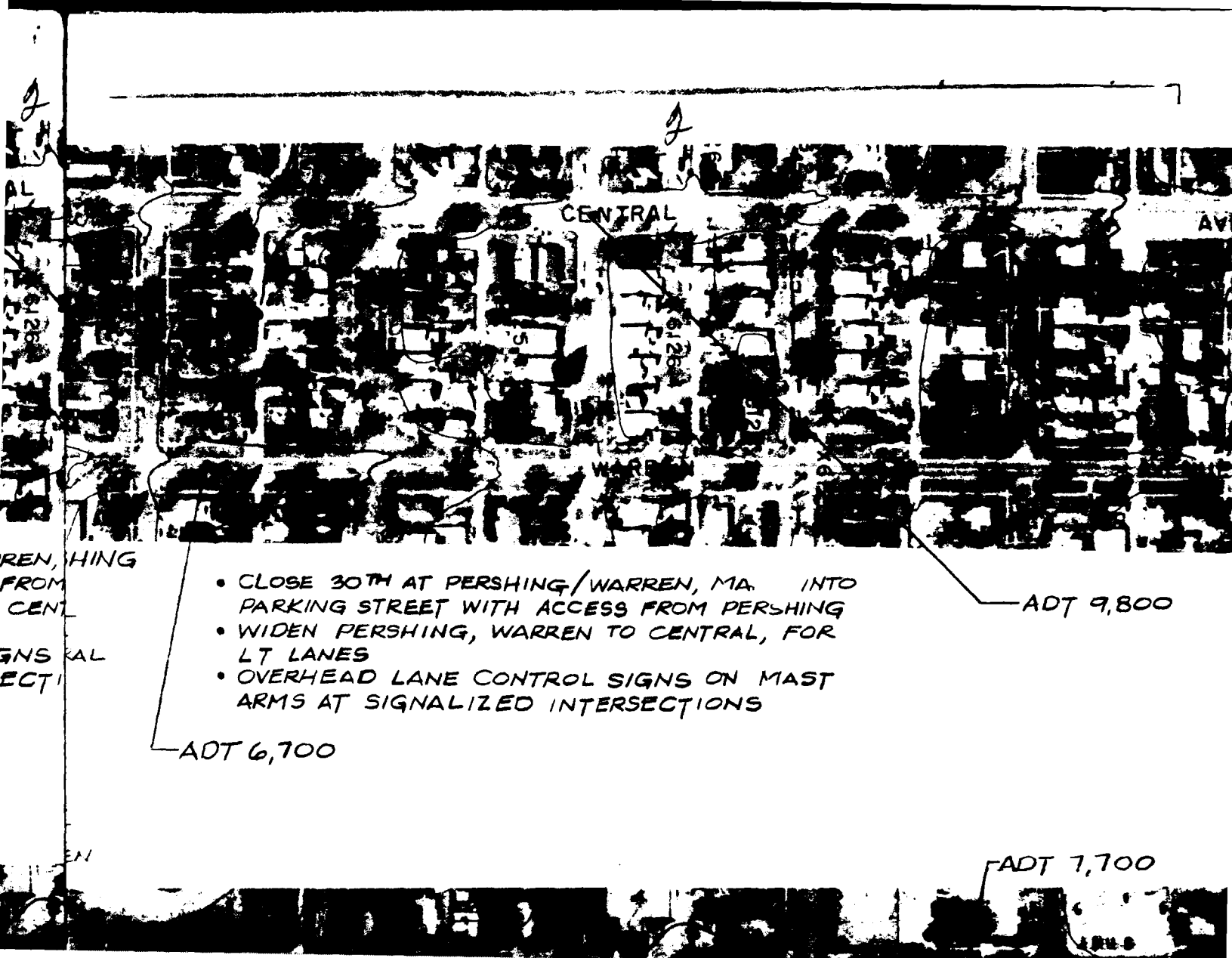
ADT 6,700



ADT 9,100

REMOVE EXCLUSIVE PEDESTRIAN PHASES ON C
EXTEND NO PARKING FROM INTERSECTION A
FOR CROSS-STREET TRAFFIC





CENTRAL

AVENUE

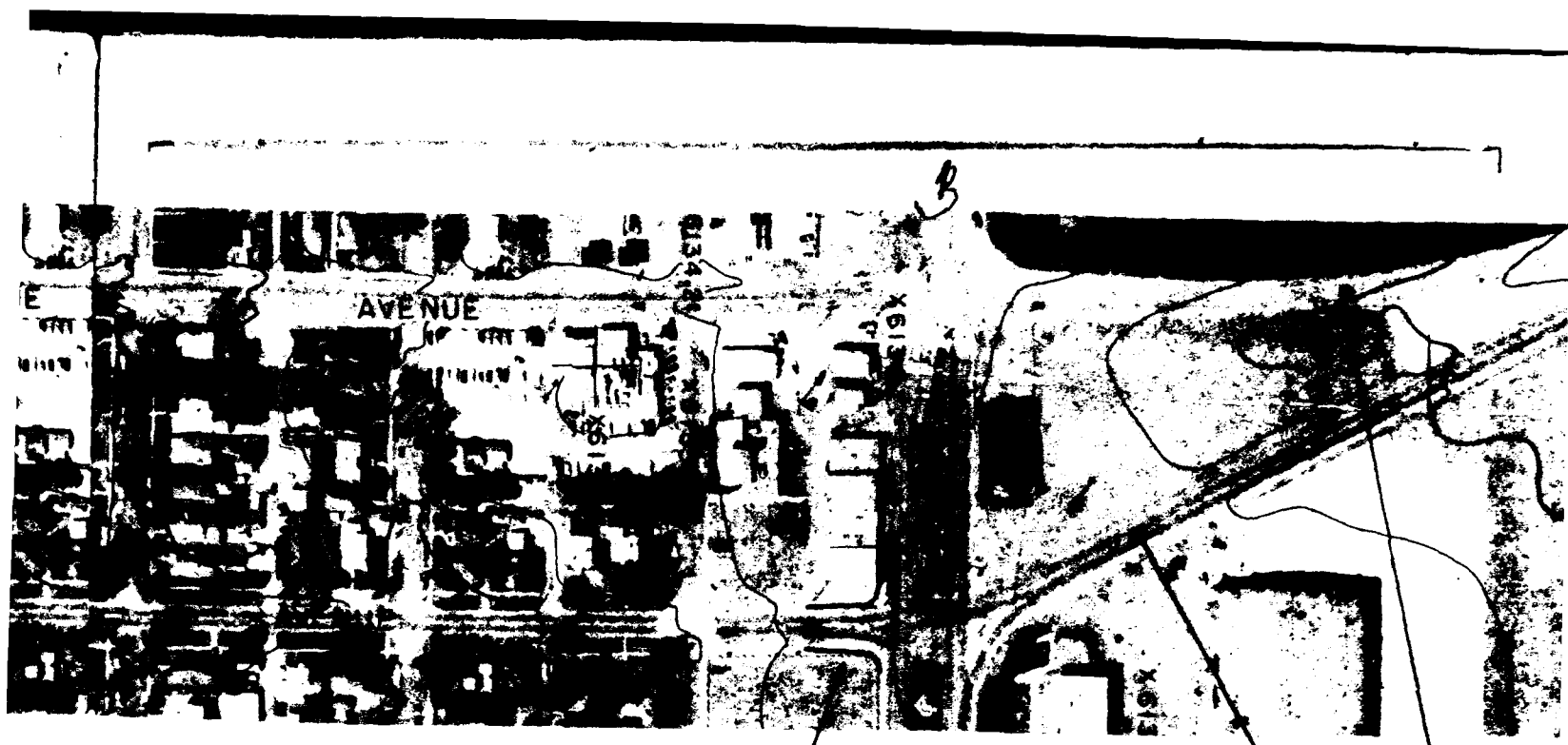
REN, HING
FROM
CENT
NS AL
ECTI

- CLOSE 30TH AT PERSHING/WARREN, MA INTO PARKING STREET WITH ACCESS FROM PERSHING
- WIDEN PERSHING, WARREN TO CENTRAL, FOR LT LANES
- OVERHEAD LANE CONTROL SIGNS ON MAST ARMS AT SIGNALIZED INTERSECTIONS

ADT 9,800

ADT 6,700

ADT 7,700



—ADT 9,800

ADD RT LANE, SIGNS
ON WARREN AT 8TH AVE.

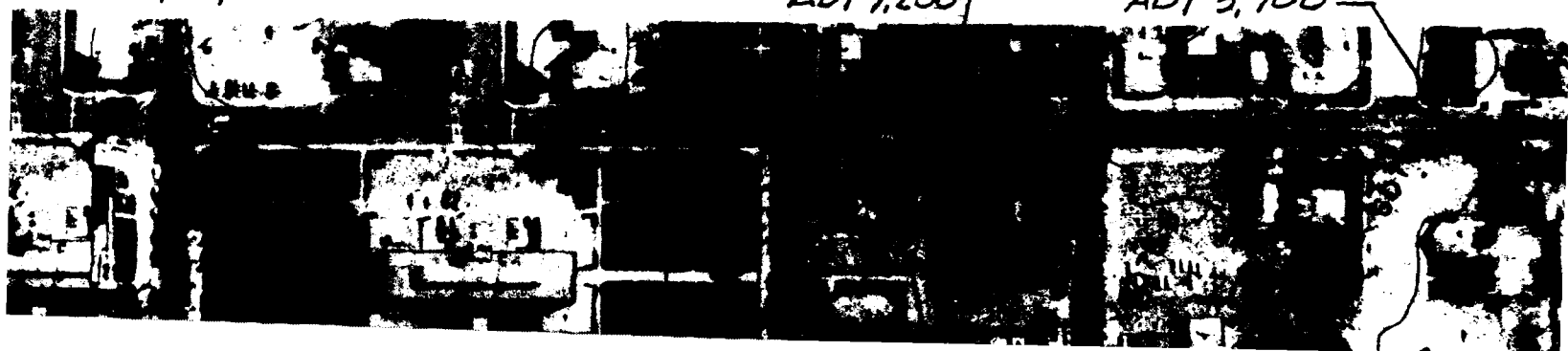
ADT

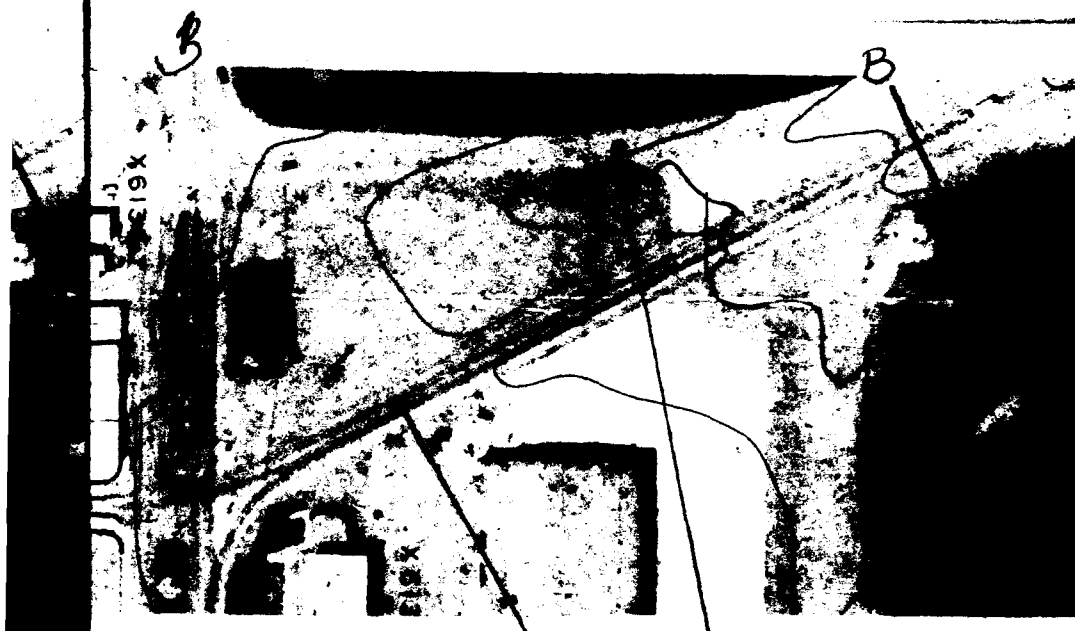
ADT 9,600

ADT 7,700

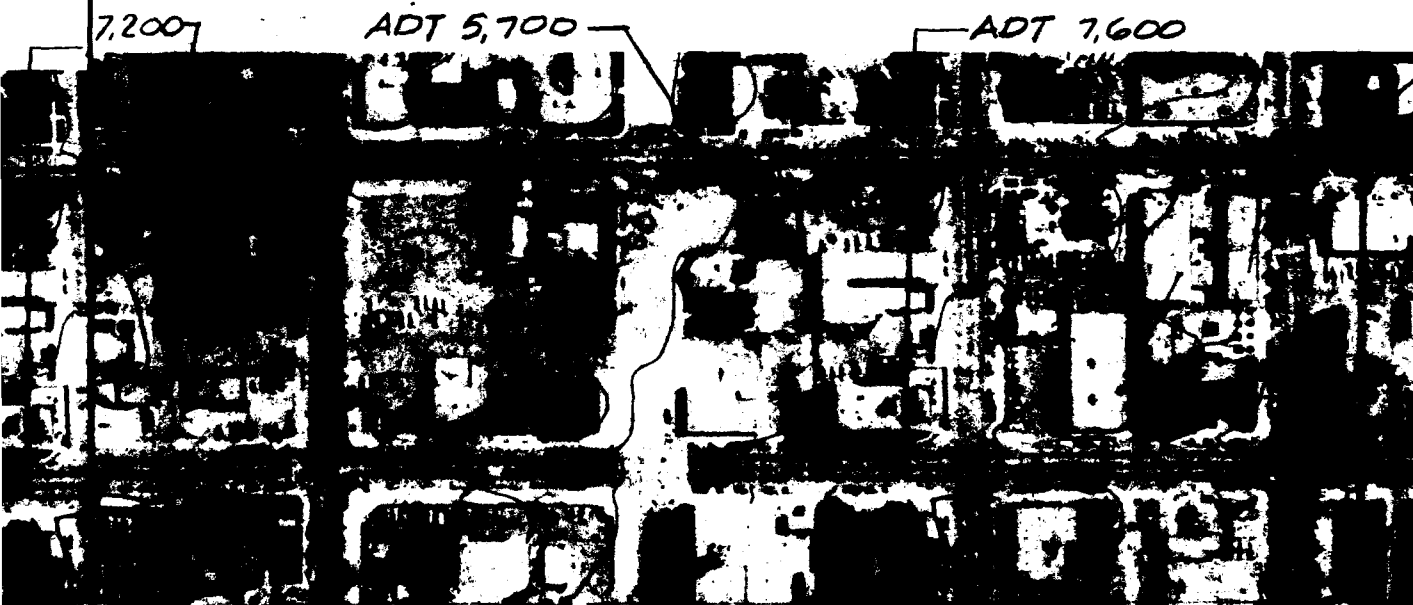
ADT 7,200

ADT 5,700





ADT 9,700
ADT 9,600
ADD RT LANE, SIGNS
ON WARREN AT 8TH AVE.



ACT

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Crown, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 2 - YELLOWSTONE/CENTRAL-WARREN

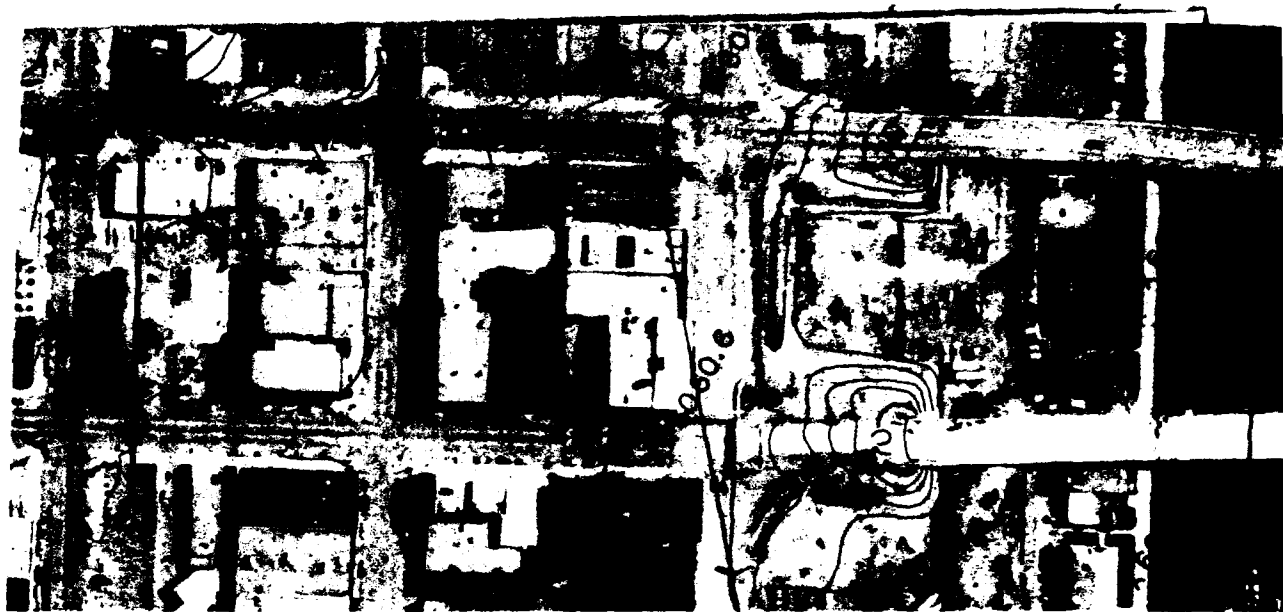
PRAIRIE TO COLLEGE DRIVE

1" = 200'

2 B

DECEMBER, 1994

①



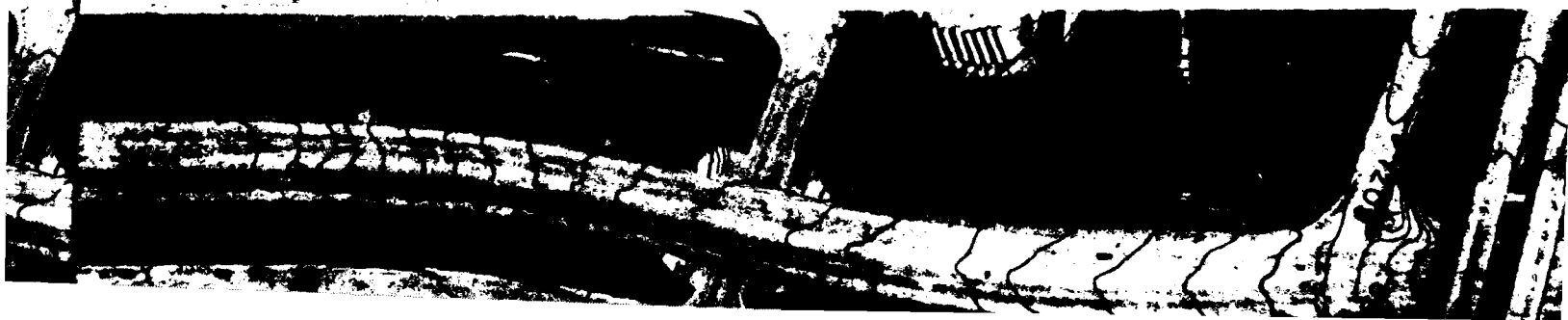
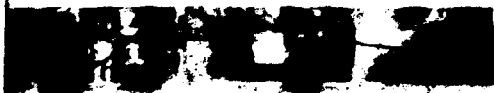
ADT 7,200

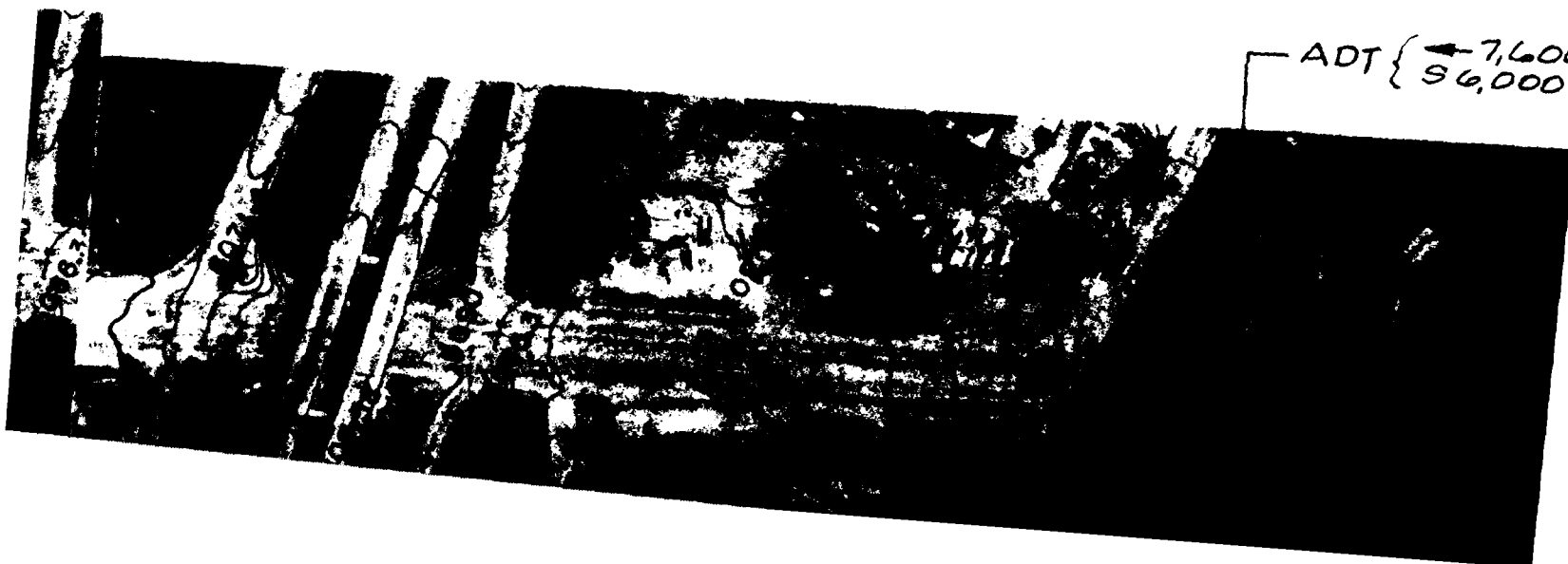
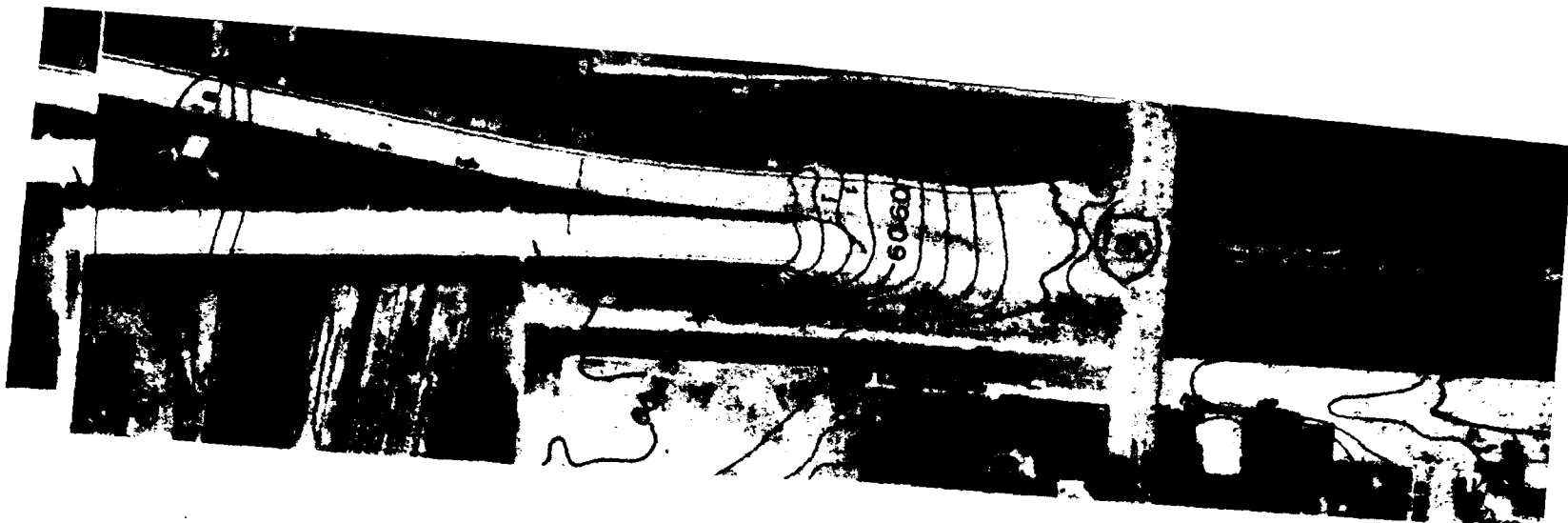
ADT 3,500





ADT 3,500





ADT { ← 7,600
96,000

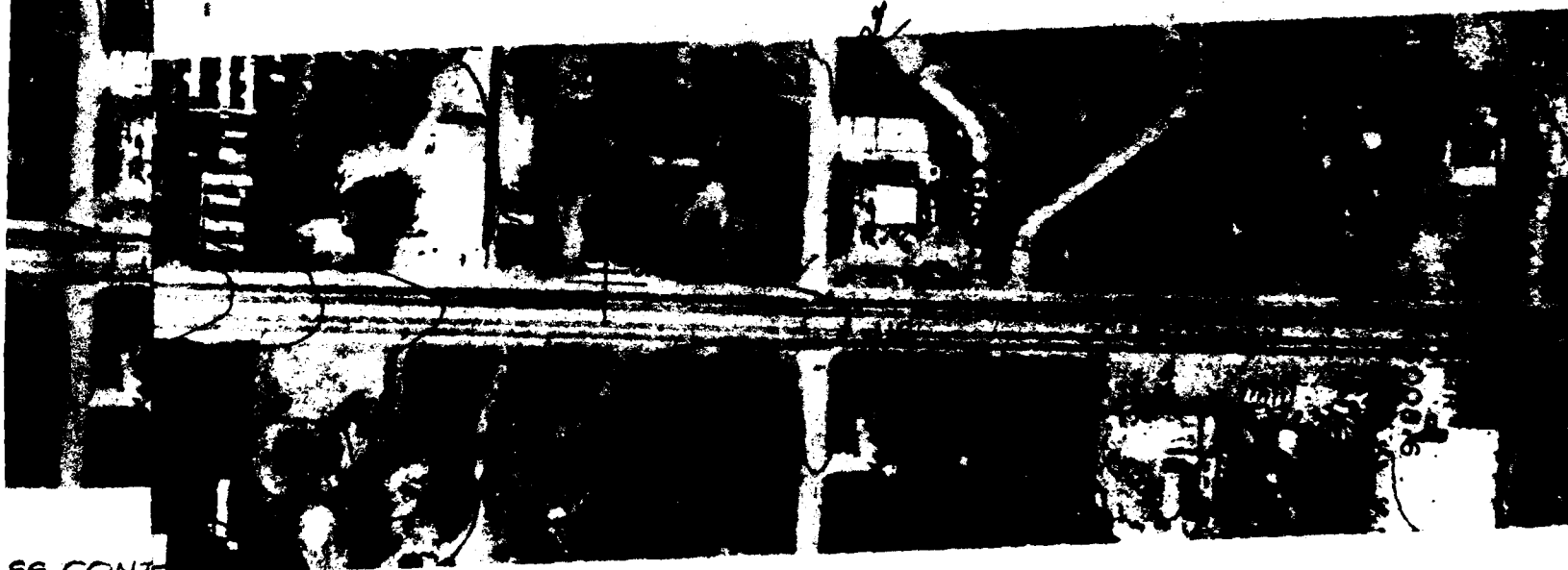
①



ADT { ← 4,500 S
N 4,500 →

ADT { ← 4,800 S
N 5,100 →

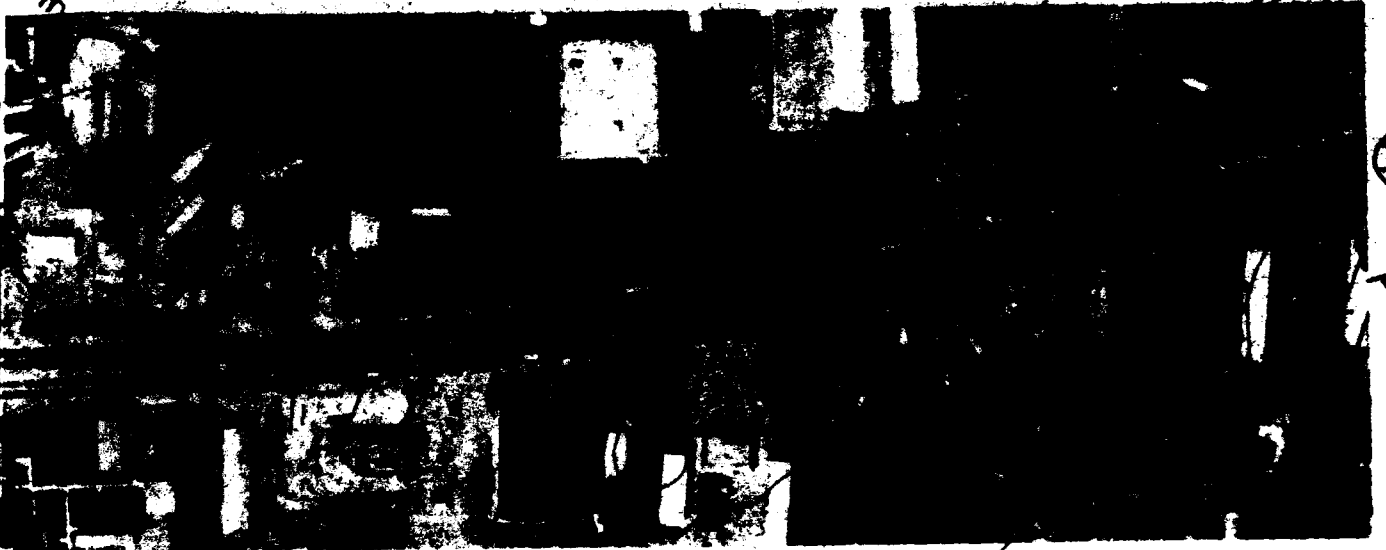
EMPHASIZE AC
SOUTH GREELE
DRIVEWAYS, CUN
STREETS FOR



SS CONT-
HIGHWAY
& GUTTER
CESS
→ 4,800 S
5,100 →

EMPHASIZE ACCESS CONTROL ON
SOUTH GREELEY HIGHWAY - CONSOLIDATE
DRIVEWAYS, CURB & GUTTER, USE OF CROSS-
STREETS FOR ACCESS





(5)

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverdale, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 2 - YELLOWSTONE/CENTRAL-WARREN

PRAIRIE TO COLLEGE DRIVE

1" = 200'

2 D

DECEMBER, 1984

2.3 LINCOLNWAY - Missile Drive to Converse

2.3.1 Existing Conditions

Lincolnway is classified as a principal arterial. The west 0.3 miles of Lincolnway from Missile Drive to Reed Avenue has five lanes, two lanes in each direction with a center left turn lane. On-street parking is generally not permitted. Road width is 56 ft. in an 90 ft. wide right-of-way, except for the section across Crow Creek which is 50 ft. wide. Land use in this area is strip commercial development with marginal access control. Speed limit is 30 mph. There are three traffic signals: Missile Drive has a two phase signal with the north approach to the tee intersection being traffic actuated; Deming Drive has a three phase pre-timed signal also at a tee intersection; Snyder Avenue has a three phase pre-timed signal with left turn phases in eastbound traffic both protected and permissive. Accidents reported at major locations for three years are:

- Missile Drive - (1981 - 2 or less, 1982 - 4, 1983 - 2 or less)
- Ames Avenue/Deming Drive - (1981 - 10, 1982 - 4, 1983 - 3)
- Snyder Avenue - (1981 - 5, 1982 - 2 or less, 1983 - 2 or less)

In the eastbound direction, there is a heavy left turn movement at Snyder. In the westbound direction, there is a heavy left turn movement at Deming Drive.

East of Reed Avenue to Capitol Avenue, for approximately 0.4 mile, Lincolnway has two lanes in each direction. On-street parking is allowed on both sides of Lincolnway starting at Bent Avenue. From Bent Avenue to Capitol Avenue the speed limit is 20 mph. Road width is 52 ft. in an 80 ft. right-of-way. West of Bent Avenue, the speed limit is 30 mph. There are traffic signals at Pioneer Avenue, Carey Avenue and Capitol Avenue. The signal at Pioneer Avenue operates as a three phase fixed time signal; at Carey Avenue the signal operates as a two phase pedestrian actuated signal; and at Capitol Avenue the signal operates as a 2 phase pre-timed signal. Accidents reported at major locations for three years are:

- Pioneer Avenue - (1981 - 6, 1982 - 2 or less, 1983 - 3)
- Carey Avenue - (1981 - 2 or less, 1982 - 5, 1983 - 2 or less)
- Capitol Avenue - (1981 - 12, 1982 - 12, 1983 - 7)

Traffic signals are set up to generally favor eastbound traffic with a better progression, since 17th Street one block north is a one-way westbound street.

East of Capitol Avenue to Van Lennon, approximately 0.3 miles, Lincolnway has two lanes in each direction with a center left turn lane. No on-street parking is allowed except in a few places. East of the CBD, the speed limit is raised from 20 mph to 30 mph. Roadway width varies in the 80 ft. right-of-way. East of Warren Avenue, the width is 52 ft. Between Capitol and Warren, the roadway is wider as a result of recently completed viaduct construction. There are traffic signals at Central Avenue, 3 phase with leading left westbound; Warren Avenue, 3

phase with leading left eastbound; and Evans Avenue, 2 phase pre-timed. Accidents reported at major locations for three years are:

- Central Avenue - (1981 - 21, 1982 - 11, 1983 - 14)
- Warren Avenue - (1981 - 7, 1982 - 9, 1983 - 24)
- House Avenue - (1981 - 4, 1982 - 6, 1983 - 5)
- Evans Avenue - (1981 - 8, 1982 - 2 or less, 1983 - 7)
- Van Lennon Avenue - (1981 - 2 or less, 1982 - 2 or less, 1983 - 3)

East of Van Lennon Avenue to Morrie Avenue, approximately 0.3 mile, Lincolnway has two lanes in each direction. On-street parking on both sides is allowed, with a 30 mph speed limit. Road width is 52 ft. in an 80 ft. right-of-way. There is a 2 phase pre-timed signal at Morrie Avenue. Reported accidents are:

- Morrie Avenue - (1981 - 3, 1983 - 5, 1983 - 6)
- Seymour Avenue - (1981 - 3, 1982 - 5, 1983 - 9)

East of Morrie Avenue to Converse Avenue, for approximately 0.8 mile, the road width varies between 4 and 5 lanes. On-street parking is allowed on the south between Morrie and 15th Street, which has 4 lanes and a westbound right turn lane. Between 15th Street and Dunn Avenue, Lincolnway has five lanes including a continuous left turn lane. Between Dunn Avenue and Logan Avenue, the road narrows to 52 ft. providing 4 lanes and no on-street parking. East of Logan to Converse, the road is 5 lanes with a center left turn lane. Speed limit is 30 mph. There are traffic signals at Dunn Avenue, Logan Avenue and Converse Avenue. All are pre-timed and operate with two phases. Accidents reported at major locations for three years are:

- Dunn Avenue - (1981 - 4, 1982 - 2 or less, 1983 - 2 or less)
- Logan Avenue - (1981 - 17, 1982 - 14, 1983 - 10)
- Converse Avenue - (1981 - 11, 1982 - 6, 1983 - 7)

2.3.2 Traffic Operations Problems

Near the Ames/Deming intersection there is a local street which permits traffic eastbound to southbound and northbound to westbound to bypass the traffic signal. There is very little access control on this bypass, and at the east end the intersection with Deming is confusing because of the large paved area and lack of marking.

West of Deming Drive, Lincolnway has very little access control. Driveways serving commercial areas are poorly marked and left turning vehicles attempting to enter these areas delay through traffic. Because of the signal phasing, especially during the p.m. peak hour, westbound traffic turning left backs up and does not clear in one cycle. In the northbound direction, capacity is restricted by the tight radius for right turns. There is a high percentage of trucks moving through this intersection. Progression through the three traffic signals at Missile Drive, Deming Drive, and Snyder Avenue needs to be coordinated for a better traffic flow.

Morrie Avenue at Lincolnway has operational problems eastbound and westbound. Because of on-street parking on the south side on the

Lincolnway east of Morrie there is no left turn lane. However, there is a left turn lane on the west approach. As a result the eastbound and westbound lanes are offset. The south leg serves as a parking lot for the commercial areas on both sides, but the street comes to a dead end here. There are sight restrictions on the east leg because of the horizontal curvature of Lincolnway. There is a fairly heavy pedestrian movement across Lincolnway on the east leg, between the parking lot on the north side and commercial area on the south side.

The intersection of Logan Avenue and Lincolnway has operational problems because of narrow lanes, unclear pavement markings and awkward geometrics. At Logan Avenue, the eastbound and westbound lanes are narrow. In addition, the intersection has a concrete surface on which pavement markings are nearly invisible. The east and west center line has been depressed into the concrete. The intersection is also on a horizontal curve, causing motorists to drift between lanes. During some field observations, it was noted that eastbound drivers sometimes were in the left turn lane when driving straight ahead. Right turning drivers, both northbound and southbound, do not have clear delineation for their turn lane.

Left turning traffic during peak hours often has to wait through several cycles since only one or two left turning vehicles clear each cycle. Access drives are too close to the intersection, especially on the northwest corner. Average speed through this intersection is relatively high, and left turning vehicles are exposed to through traffic. There are also geometric problems on the north side of this intersection with Albany Avenue because of the angle in which Albany Avenue intersects Logan Avenue and the Lincolnway westbound one-way right turn lane. There is also a conflict over who has the right-of-way on the north side of this intersection.

At Converse Avenue, northbound through traffic directly faces the southbound left turn. This is hazardous because some northbound motorists proceed directly across Converse and encroach the southbound left turn lane.

2.3.3 Planned/Programmed Improvements

The traffic signals at Lincolnway and Ames Avenue are scheduled for upgrading in early 1985. This WHD project is expected to improve traffic flow on the west end of the corridor.

Recently a separate right turn lane was added to Lincolnway westbound at Morrie. This has increased intersection capacity westbound, and made traffic diversion to the 19th/20th one-way prior more attractive. Improvements to Morrie/Pershing (see 2.1.5) will make Morrie more accessible for northbound traffic.

With the completion of the Central/Warren viaducts, the temporary bottleneck on Lincolnway in the center of the CBD has been improved.

2.3.4 Alternative Improvement Actions

Depending upon the phasing of improvements to the South Cheyenne Inner Drive (see Section 2.5), major improvements to the Lincolnway/Deming intersection may be required to deal with the bottleneck created by the offset between Deming and Missile Drive. Similarly, the South Inner Drive will require earlier action to deal with the Lincolnway/Logan intersection.

The section of Lincolnway through the CBD, from west of Pioneer to east of Warren, was evaluated in the recently completed 16th/17th Streets Corridor Study (September 1983). This study recommended implementation of a one-way pair through the CBD, to balance traffic demand between Lincolnway and 17th Street. This concept should be pursued.

Improvements to Converse (see Section 2.12), Logan (see Section 2.6) and Morrie between Lincolnway and Pershing, and improving the access to the east end of the 19th/20th corridor (see Section 2.4) would all help divert traffic away from Lincolnway and reduce demand on the corridor east of Evans Avenue. Improvements to the west end of the 19th/20th corridor (see Section 2.6) would provide a better alternate route to the north edge of the CBD and the Capitol/State office building complex, also reducing demand on Lincolnway.

Major street widening within the limited 80 ft. right-of-way does not appear feasible, and removal of parking in the congested CBD area would likely present major public reaction problems -- as well as remove heavily used parking from the already limited supply.

2.3.5 Recommended Improvement Plan

Construction of curb and gutter, together with consolidation and elimination of driveway accesses, is recommended for selected areas at the west end, between Crow Creek and Thomes. The area west of Deming and south of Lincolnway merits early attention, including closure of the local street bypass between Deming and Lincolnway at Crow Creek.

The traffic signal at Snyder should be upgraded to actuation for left turn movements. Similar upgrading of the signals at Central and Warren is desirable, to reduce capacity loss to unused left turn phases.

The driveways serving the two restaurants on Lincolnway south of Evans should be consolidated into one median divided driveway, one lane in each direction, with actuated signals for Evans through/left movements and driveway exit movements.

West of Morrie, the parking on the south side of Lincolnway should be removed, and the pavement markings replaced to properly align lanes in the east and west directions. A westbound left turn lane should be provided to facilitate access to the commercial areas on the south side of Lincolnway.

Major improvements to the Logan intersection are warranted immediately. This section of Lincolnway carries in excess of 20,000 ADT, and the intersection approaches are quite substandard. From Hugur east to

Logan, Lincolnway should be widened to a five lane section, 60 ft. wide, with a separate left turn lane. Reconstruction of curb and gutter should include relocation of access driveways as far away from the intersection as practical. The westbound approach, north side, should be reconstructed to provide a wide right turn radius and adequate left turn lane. Reconstruction of curb and gutter should include relocation of access driveways as far away from the intersection as practical. The westbound approach, north side, should be reconstructed to provide a wide right turn radius and adequate left turn lane. The one way lane from Lincolnway westbound to Logan northbound should be closed, and the right-of-way remainder vacated.



ADT 14,400

CONTROL ACCESS ALONG
16TH ST. TO OPTIMIZE USE OF
UPGRADED AMES SIGNAL INSTALLATION

CONTINUE
16TH ST/ LII
GUTTER, SA
RESTRICT



CENTRAL AVE

WARREN AVE

ADT 19,000

LT ACTUATED SIGNALS EB/WB
ON LINCOLNWAY AT CENTRAL/WARREN

CO
EN
AN

ED A

MAKE LT ACTUATED AT SNYDER
AND LINCOLNWAY

PIONEER AVE.

CESS TO
IRB AND
TURN



IMPLEMENT ELEMENTS
CORRIDOR PLAN - 17TH
- TRAJ
OF P
OF N

Professional Corporation

ARIX

Engineers Architects Planners

Greenlee, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 2 - YELLOWSTONE/CENTRAL-WARREN

PRAIRIE TO COLLEGE DRIVE

1" = 200'

2 C

DECEMBER, 1984



PIONEER AVE.

ADT. 11,300

CAREY AVE.

IMPLEMENT ELEMENTS OF 16TH/17TH
CORRIDOR PLAN - 17TH 1-WAY WB
- TRANSITIONS WEST
OF PIONEER, EAST
OF WARREN



PROHIBIT PARKING
S. SIDE LINCOLNWAY
E. OF MORRIS;
REMARK LANE
LINES TO MATCH



A Professional Corporation

ARIX

Engineers Architects Planners

Greenlee, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

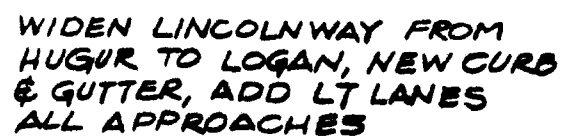
CORRIDOR 3 - LINCOLNWAY

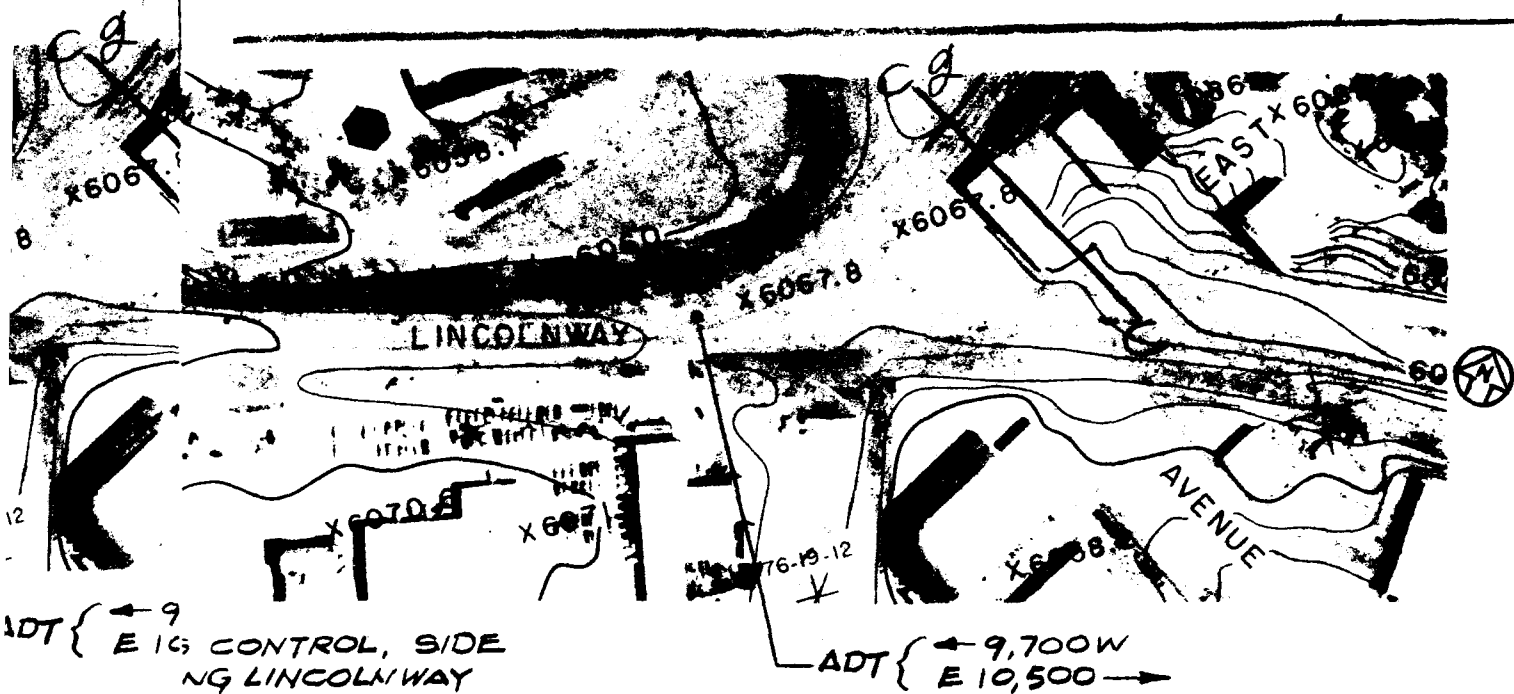
MISSILE DRIVE TO CONVERSE

1" = 200'

3 A

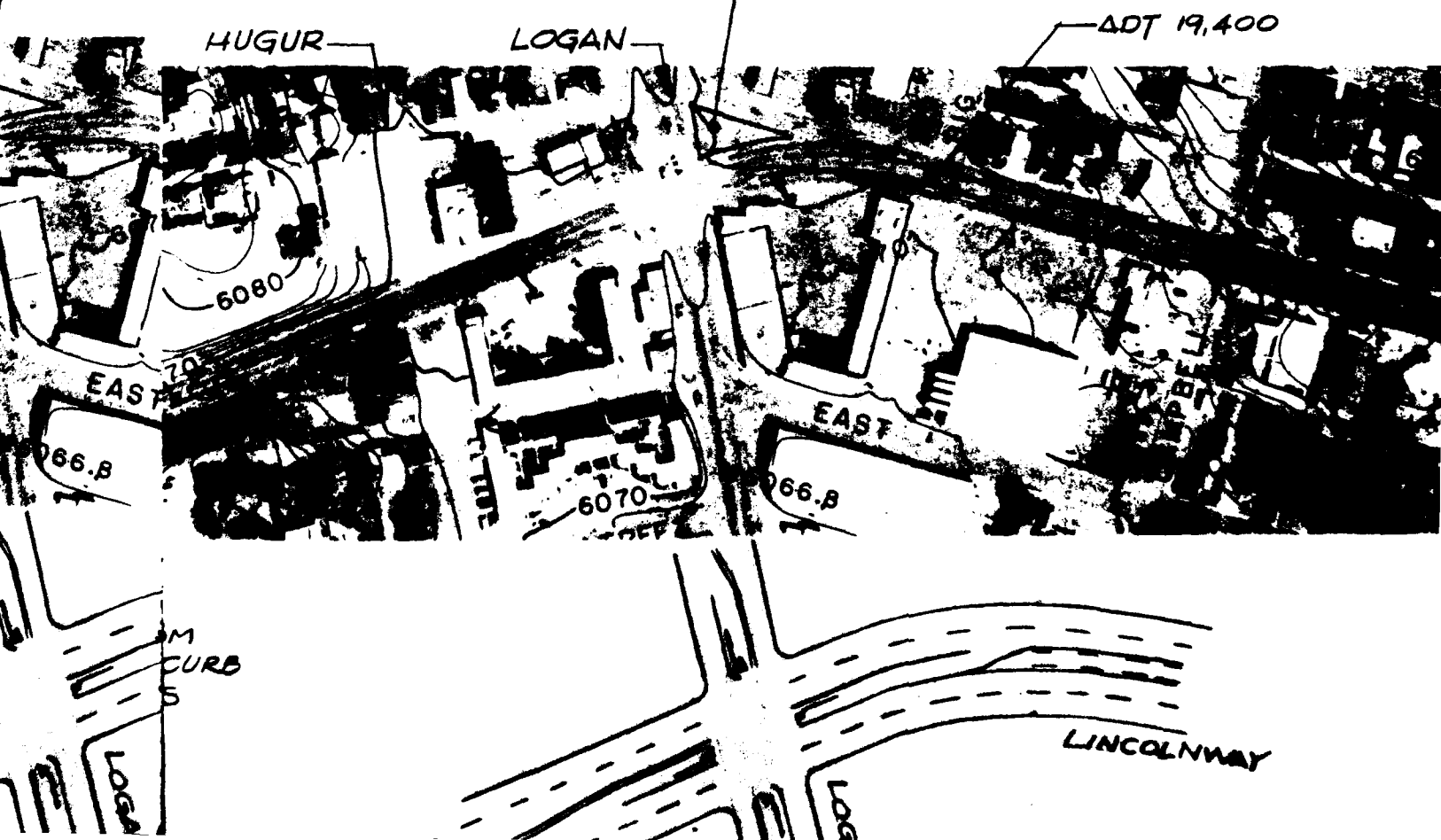
DECEMBER, 1984





VACATE
EAST O.
ISLAND

VACATE ONE-WAY STREET
EAST OF LOGAN, AND
ISLAND

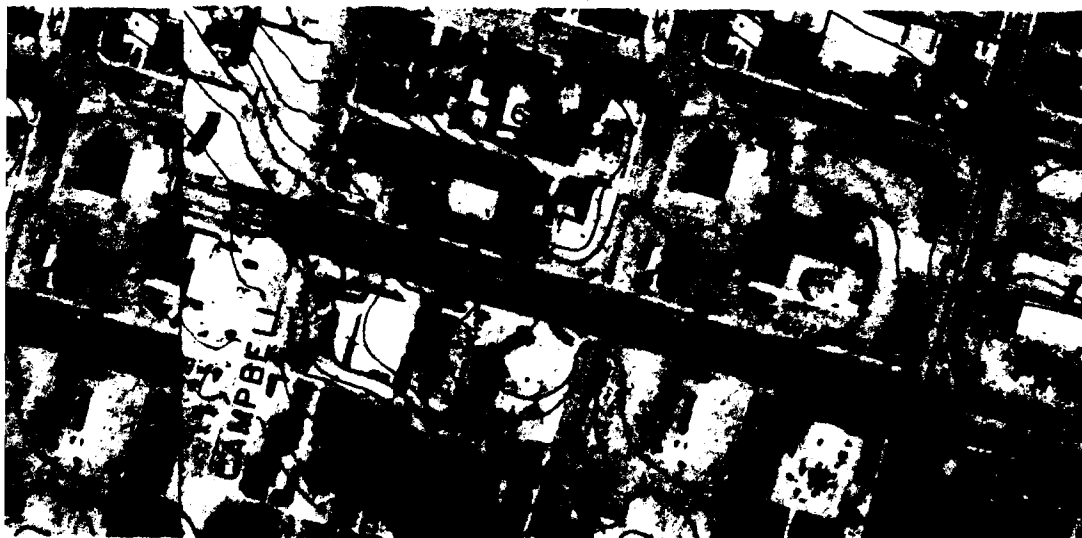




3

REET

DT 19,400



ADT 18,

ADT 18,300

COLNWAY

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

(4)

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 3 - LINCOLNWAY

MISSILE DRIVE TO CONVERSE

1" = 200'

3 B

DECEMBER, 1984

CHEYENNE

COR

MISS

100'

2.4 19TH/20TH STREETS - Happy Jack/Missile Drive to Converse

2.4.1 Existing Conditions

The 19th/20th Streets one-way pair is a minor arterial throughout the length of the corridor. Functionally, it provides an important east-west link across the north edge of the CBD between Missile Drive and Converse Avenue at Pershing, serving as a primary access route to both the downtown area and the capitol/state office building complex north of the CBD.

The west end of the corridor is at the intersection of Missile Drive and Happy Jack Road, where a short section of 19th Street runs two-way, with one lane in each direction, over Crow Creek. Happy Jack and 19th intersect Missile at a sharp 30 degree angle.

East of the bridge, at Dey, 19th Street becomes one way eastbound, with two lanes and parking on both sides to Pioneer, where the roadway widens to three lanes with parking. The three lane section continues to Warren, then reverts to two lanes with parking to Logan. The eastbound one way continues on the south side of the 19th Street parkway median between Logan and Converse, with one lane and parking on the south side to the 21st Street diagonal intersection, then two lanes and parking on one side to Converse. On the north side of the parkway median between Logan and 21st Street one lane runs westbound, with parking on the north side.

The westbound leg of the one way pair begins at Converse, running on 19th Street to 21st Street, where one lane of two way, two lane 21st Street provides a diagonal line to 20th Street. 20th Street is also two way between 21st Street and Logan, providing only one westbound lane. At Logan, 20th Street becomes one way westbound with two lanes and parking on both sides. At Evans, the westbound section widens to three lanes with parking on both sides, and continues west to Snyder, where it narrows to two lanes with parking to Dey. Dey is a two way street, with the single southbound lane connecting 20th Street to 19th Street and the Crow Creek bridge.

Reported accidents at major locations are:

19th Street

- Missile/Happy Jack - (1981 - 2 or less; 1982 - 7; 1983 - 5)
- Snyder - (1981 - 3; 1982 - 5; 1983 - 4)
- Pioneer - (1981 - 2 or less; 1982 - 8; 1983 - 10)
- Carey - (1981 - 2 or less; 1982 - 5; 1983 - 4)
- Central - (1981 - 4; 1982 - 10; 1983 - 5)
- Capitol - (1981 - 5; 1982 - 2 or less; 1983 - 2 or less)
- Warren - (1981 - 2 or less; 1982 - 5; 1983 - 7)
- Evans - (1981 - 5; 1982 - 3; 1983 - 2 or less)
- Morrie - (1981 - 6; 1982 - 4; 1983 - 3)
- Logan - (1981 - 11; 1982 - 8; 1983 - 9)
- 21st - (1981 - 2 or less; 1982 - 2 or less; 1983 - 2 or less)
- Converse - (1981 - 12; 1982 - 2 or less; 1983 - 10)

20th Street

- ° Logan - (1981 - 8; 1982 - 3; 1983 - 2 or less)
- ° Morrie - (1981 - 2 or less; 1982 - 3; 1983 - 3)
- ° Evans - (1981 - 6; 1982 - 4; 1983 - 2 or less)
- ° Warren - (1981 - 12; 1982 - 8; 1983 - 9)
- ° Central - (1981 - 10; 1982 - 3; 1983 - 10)
- ° Capitol - (1981 - 3; 1982 - 6; 1983 - 4)
- ° Carey - (1981 - 2 or less; 1982 - 3; 1983 - 2 or less)
- ° Pioneer - (1981 - 2 or less; 1982 - 2 or less; 1983 - 2 or less)
- ° Snyder - (1981 - 5; 1982 - 2 or less; 1983 - 6)

2.4.2 Traffic Operations Problems

Generally the one-way pair functions quite well throughout its length. The major exceptions to this are the east and west termini, where the one way pair transitions to two way traffic flow. Both are woefully inadequate, and serve to obstruct efficient use of this arterial link.

The west end exhibits several problems:

- ° The flat angle between Happy Jack and Missile makes east to north left turns extremely difficult; vehicles must make this turn slowly, and remain exposed to northbound traffic on Missile Drive.
- ° The south to east left turn from Missile to 19th Street is awkward, since traffic must cover a large area of uncontrolled intersection and navigate through narrow channelized lanes to reach 19th.
- ° The narrow bridge across Crow Creek provides only one lane for eastbound and westbound traffic.
- ° The north to east right turn from Missile to 19th is a sharp 150 degree turn with inadequate channelization and no space to merge with eastbound traffic from Happy Jack and Missile southbound.
- ° The transition from 20th westbound via one southbound lane on Dey is awkward, requiring two sharp turns through constricted intersections.

The east end is similarly deficient:

- ° Two lanes start westbound on 19th Street from Converse, exiting a recently upgraded intersection which effectively moves traffic from westbound Pershing and southbound Converse onto 19th Street. However, at the 21st Street intersection, only one lane is continued in the logical westbound diagonal to reach 20th Street, and this runs on a two way street.
- ° A single lane continues west on 19th, but if traffic choosing this route desires to continue west, it must turn right at Logan, then negotiate the awkward left turn from Logan to 20th Street.

- ° The 21st Street intersection with 19th exhibits conflicts between westbound traffic and the local traffic moving east on 21st. The approach angles are poor, and 21st Street traffic moving east must cross the median and merge with 19th Street eastbound traffic.
- ° At 21st and 20th the necessary left turn across opposing traffic is aggravated by a large valley gutter with poor driving comfort.
- ° The transition from one lane to two lanes westbound across Logan is poorly marked.

Another less significant problem in the corridor is the forced stop of 19th and 20th at Snyder, a case where a minor arterial must yield to a crossing collector street. Also, the 19th/20th intersections with other one-way streets in the CBD (Pioneer/Carey and Warren/Central) experience turning conflicts.

2.4.3. Planned/Programmed Improvements

No firm projects are planned in this corridor, but two major projects are under active consideration. These are described in the following section.

2.4.4 Alternative Improvement Actions

A project to reconstruct the Happy Jack/Missile/19th-20th intersection has been considered for some time but no definitive action has been taken. A number of concept plans have been examined, and a greatly improved intersection certainly appears to be technically feasible. Since this project is likely to be quite costly, it should be advanced to high priority within the Federal Aid Urban program, the most likely source of funding. Potential benefits include diversion of traffic from both the Lincolnway corridor and the Pershing/Randall corridors, especially traffic related to Warren AFB. The high capacity available from Missile Drive and I-25 is being wasted due to this bottleneck.

Key elements of the project should include moving the Happy Jack/Missile intersection north, to remove it as a source of conflict, and emphasizing easy flow between the Missile Drive north leg and 19th/20th -- south to east left turns and west to north right turns. Also, examination should be made of the cost trade-offs between extending 20th Street west over Crow Creek, and making the one-way/two-way transition diagonally across a block east of Dey. This would compare land cost with structure cost.

At the east end a project is being considered to widen 19th Street between Logan and the 21st Street intersection to two lanes, by removing part of the landscaped median. This project could increase capacity eastbound, but it does little to improve capacity westbound, which is the severe bottleneck. One alternative could use both existing lanes of 19th as eastbound lanes, to 21st, then merge them to the south side.

Regardless of what is selected for the eastbound movement, it is strongly recommended that the westbound flow be improved. This could be accomplished by making 21st Street one way westbound to 20th Street, and continuing one way on 20th across Logan to the west. Two lanes could easily be carried and all local block faces could have convenient access. This improvement could be done at relatively low cost, and should ease the demand on Pershing for westbound capacity.

2.4.5 Recommended Improvement Plan

Early consideration should be given to reassigning priority to 19th/20th at Snyder, and a signal warrant study to examine traffic volumes and accident experience should be undertaken.

Overhead lane use control signs, and providing only one turning lane between one-way intersecting streets in the CBD, should be evaluated.

Preliminary engineering studies for the reconstruction of Happy Jack/Missile/19th-20th should be funded soon, so that a constructable and efficient project can be defined and a supportable case for construction funding can be developed.

The proposed project on 19th between Logan and Converse should be re-evaluated to incorporate improvements in the westbound direction as well. This project also requires detailed design, as it entails a moderate amount of reconstruction beyond simple traffic control signing and marking.

①



EXTEND 20TH ST. W.B. OVER CROW
CREEK, IMPROVE 19TH ST. EB. OVER
CROW CREEK TO 2 LANE EACH DIRECTION,
CONNECT TO MISSILE DRIVE. RELOCATE
HAPPY JACK INTERSECTION WITH MISSILE
DRIVE NORTH

ADT 4,400

(SEE FIGURE 4B FOR SCHEMATIC LAYOUT,
AND OTHER PLANS PREPARED FOR CITY,
FOR ALTERNATE CONCEPTS)



CENTRAL AVE

WARREN AVE.

ADT 6,200

ADT 5,600

AC

E

LOW
OVER

ADT 4,400

SNYDER AVE.

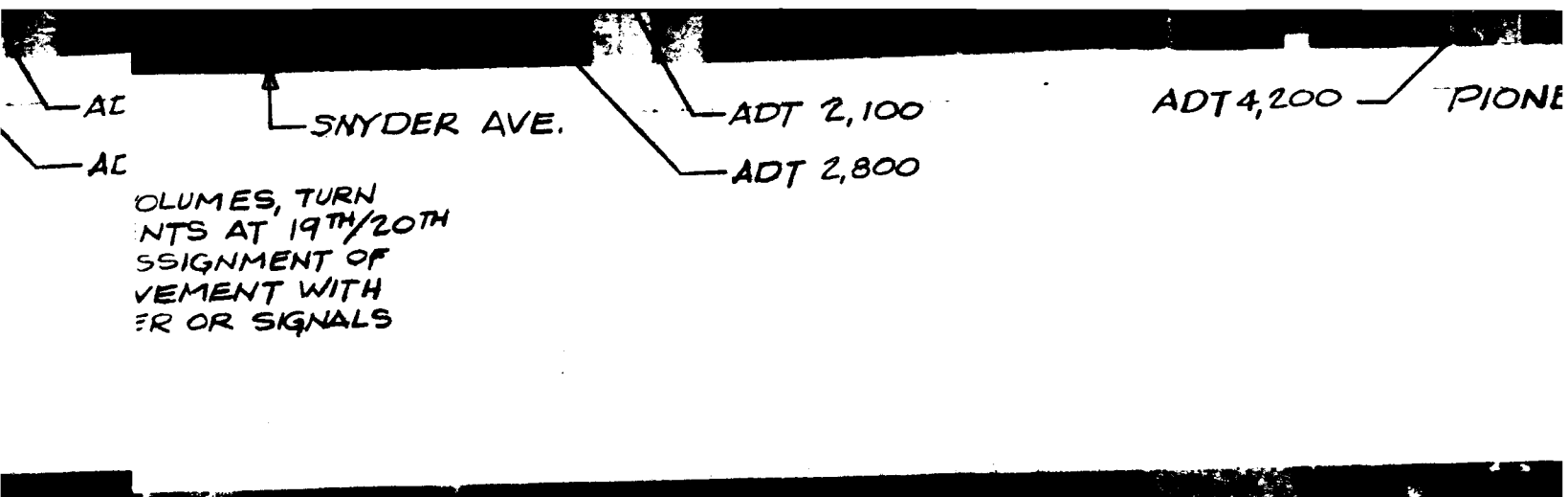
EVALUATE DIRECTION,
MOVEMENT LOCATE
AND SNYD MISSILE
PRIORITY
STOP SIGN LAYOUT,
IF WARRANT FOR CITY,

EVALUATE TRAFFIC VOLUMES, TURN
MOVEMENTS, ACCIDENTS AT 19TH/20TH
AND SNYDER, FOR ASSIGNMENT OF
PRIORITY TO E/W MOVEMENT WITH
STOP SIGNS ON SNYDER OR SIGNALS
IF WARRANTED

700 —

ADT 5,600

ADT 6,700 —



AL

AL

SNYDER AVE.

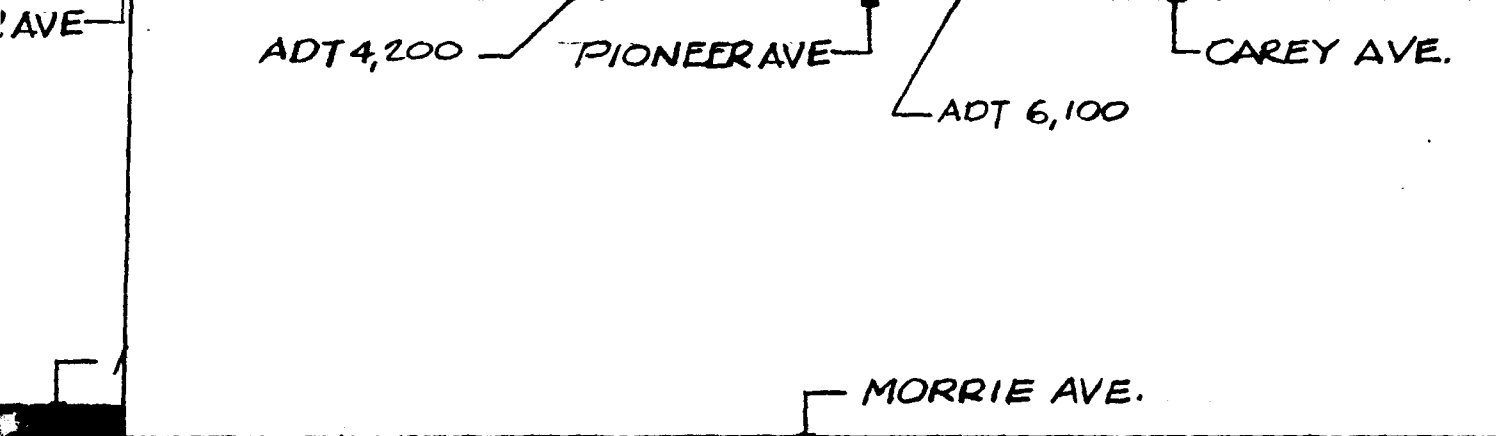
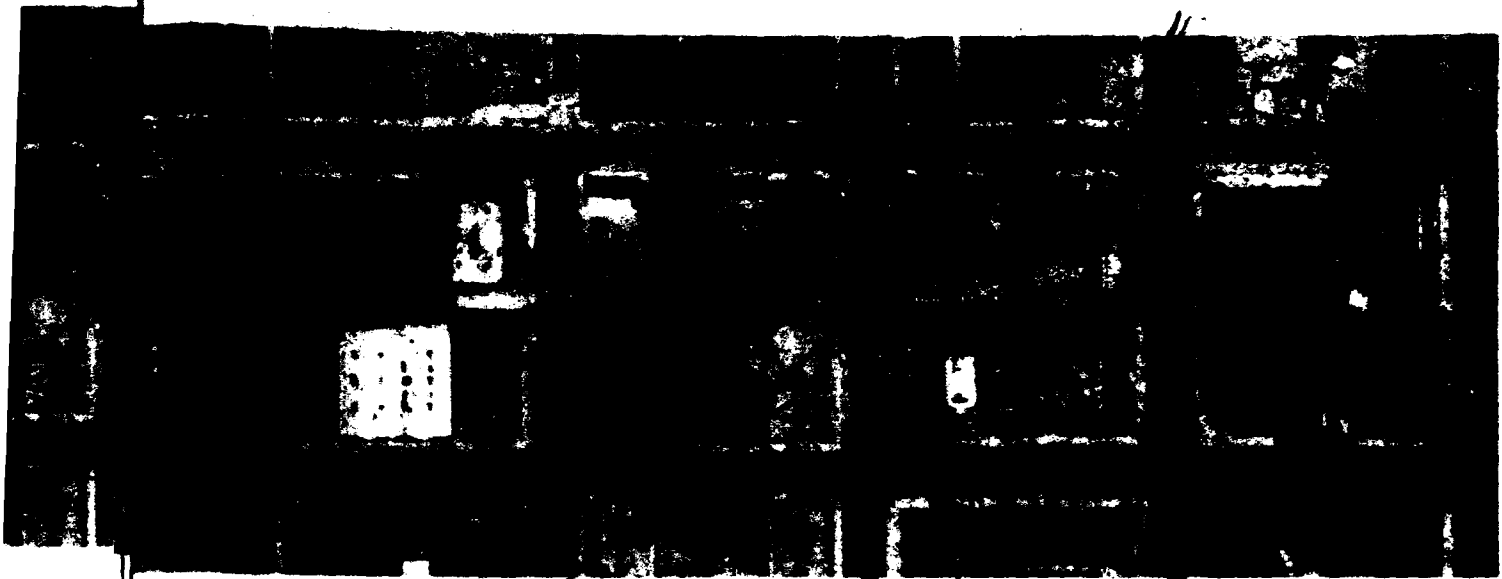
ADT 2,100

ADT 2,800

ADT 4,200

PIONEER

VOLUMES, TURN
ENTS AT 19TH/20TH
SSIGNMENT OF
VEMENT WITH
ER OR SIGNALS



CHEYENNE
CORRIDOR
HAPPY JACK

A Professional Corporation ARIX Engineers Architects Planners Greely, Colorado Grand Junction, Colorado Riverton, Wyoming Orem, Utah	CHEYENNE IMPACT CORRIDOR STUDY		
	CORRIDOR 4 - 19TH/20TH STREETS		
	HAPPY JACK/MISSILE DRIVE TO CONVERSE		
	1" = 200'	4 A	DECEMBER, 1984

①

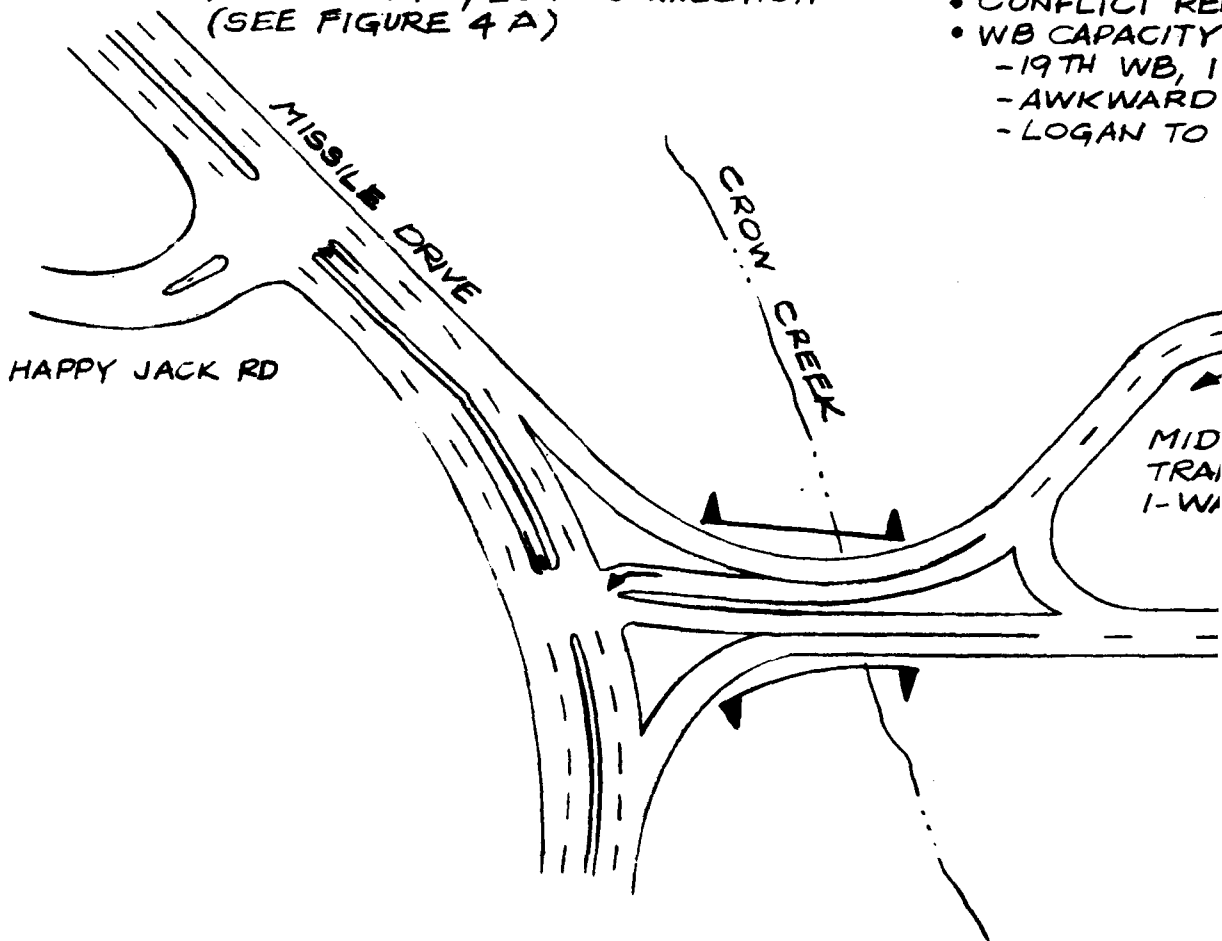


ADT 5,900

ADT 5,300

ADT 6,800

MISSILE - 19TH/20TH CONNECTION
(SEE FIGURE 4 A)

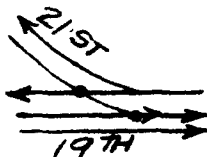


PROJECT BEING
CONVERSE, WITH
FROM NARROWIN
CLOSURE OF ME

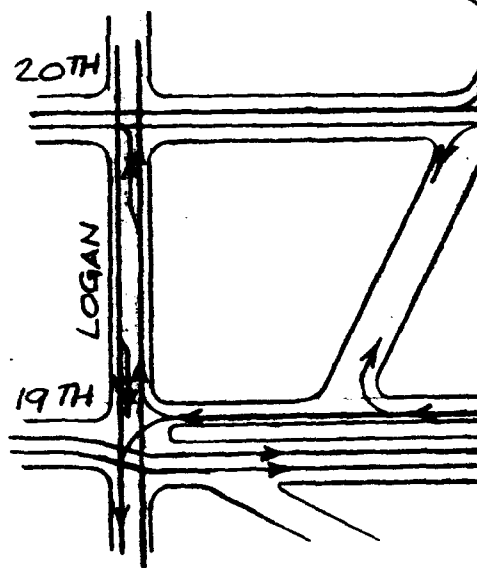
- CONFLICT REI
- WB CAPACITY
 - 19TH WB, 1
 - AWKWARD
 - LOGAN TO

DEN 19TH, LOGAN TO
 SPACE RESULTING
 ANS; ALSO SELECTIVE
 19TH INTERSECTION
 ATE

O 21ST TO 20TH
 REMAINS AWKWARD



RECOMMEND IMPROVING
 MATCH CAPACITY EB, RE



- 2 L EB 19TH S
- 2 L WB 19TH T
- SELECTIVE CL
LOCAL ACCES

A Professional Corporation

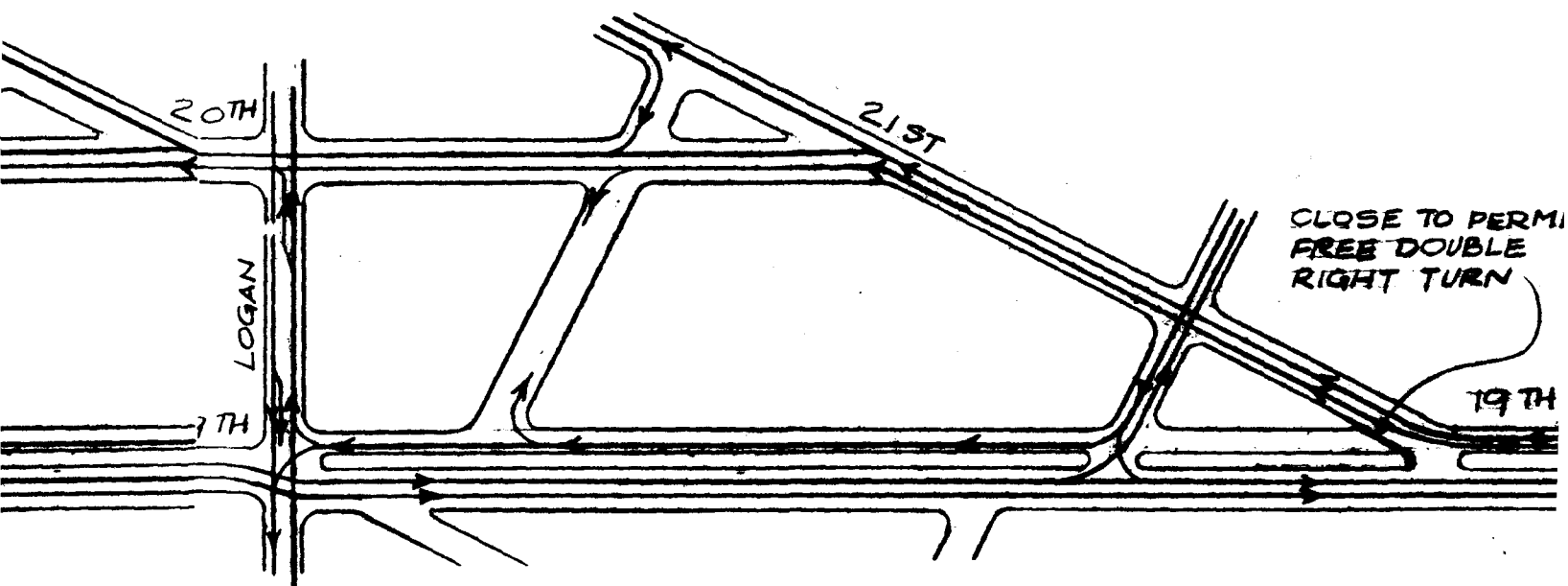
ARIX

Engineers Architects Planners

Greeley, Colorado
 Grand Junction, Colorado

MOVEMENT RECOMMEND. IMPROVING WB MOVEMENT, CONVERSE TO LOGAN, TO
 DEMAND 1/4 TRUCK CAPACITY EB, REDUCE DEMAND ON PERSHING

ADT { ← 4,800 W
 E 4,200 →



LOCAL ACCE
 1ST TO 20
 RE OF PAR

- 2 L EB 19TH ST, LOCAL ACCESS ON NORTH SIDE OF PARKWAY
- 2 L WB 19TH TO 21ST TO 20TH
- SELECTIVE CLOSURE OF PARKWAY MEDIAN TO PERMIT LOCAL ACCESS

CHEYENNE

CORR

HAPPY JACK

1" = 200'

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
 Grand Junction, Colorado
 Riverton, Wyoming
 Ogden, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 4 - 19TH/20TH STREETS

HAPPY JACK/MISSILE DRIVE TO CONVERSE

1" = 200'

4 B

DECEMBER, 1984

2.5 MISSILE DRIVE/LINCOLNWAY/DEMING/9TH - Happy Jack to Duff

2.5.1 Existing Conditions

Missile Drive from Happy Jack Road (WYO 4006) to Lincolnway, approximately 0.25 mile, is classified as a minor arterial. Adjacent land use is a mixture of open space, low density residential and some commercial areas, and does not contribute significantly to traffic on Missile Drive. The speed limit is 40 mph and on street parking is not permitted. Missile Drive is a four lane divided highway with a wide concrete median separating two 36 foot wide traveled ways. Left turn lanes are provided at Happy Jack Road in northbound and southbound directions. Happy Jack Road/19th Street intersects Missile Drive at about a 30 degree angle. The Lincolnway intersection is a tee with a two phase traffic actuated signal. Reported accidents at Missile Drive and Happy Jack Road include 1981 - 2 or less; 1982 - 7; 1983 - 3.

The Lincolnway portion of this corridor is described in Section 2.3.

Deming Drive from Lincolnway to 9th Street, approximately 1.0 miles, is classified as a minor arterial. Adjacent land use is primarily residential with some commercial. Crow Creek parallels the east edge of this section for most of its length and restricts access. There are two railroad underpasses and a bridge over Crow Creek between Lincolnway and Parsley Boulevard which restrict widening of Deming Drive. The roadway section is approximately 30 ft. wide. Between Lincolnway and the first underpass, an access road connects to Lincolnway at Dey Avenue. Between Lincolnway and 9th Street the speed limit is 30 mph and on-street parking is not permitted. However, because of poor access control, vehicles park adjacent to the roadway. Between Parsley Boulevard and 9th Street the street is 30 ft. wide in an 80 ft. right-of-way. There is a designated school crossing across Deming Boulevard at 9th Street with advance warning and crossing location signs. There is a two phase, pre-timed traffic signal at Parsley Boulevard. Reported accidents at the major locations are:

- Parsley Boulevard - (1981 - 3; 1982 - 2 or less; 1983 - 2 or less)
- 9th Street - (1981 - 2 or less; 1982 - 3; 1983 - 4)

9th Street between Deming Boulevard and Duff Avenue, approximately 0.9 mile, is classified as a minor arterial. Adjacent land use is residential with some minor commercial areas and generates significant traffic volume. The speed limit is 30 mph and on-street parking is permitted on both sides of 9th Street. Right-of-way is 80 ft. for the entire section and the street is 44 ft. wide except between Carey Avenue and Deming Boulevard where the street narrows to 33 ft. wide. There is also a bridge across Crow Creek at this location. This section has one lane in each direction except at I-180 where both approaches have additional left turn lanes. There is a two phase, traffic actuated signal at I-180. Reported accidents are:

- ° Central Avenue - (1981 - 4; 1982 - 2 or less; 1983 - 2 or less)
- ° I-180 - (1981 - 8; 1982 - 7; 1983 - 9)
- ° Warren Avenue - (1981 - 2 or less; 1982 - 3; 1983 - 2 or less)

2.5.2 Traffic Operations Problems

The Missile Drive/19th Street/Happy Jack Road intersection is addressed in Section 2.4.2; generally the problems relate to awkward skews between intersecting streets, and difficult turn maneuvers.

North-south traffic between Missile Drive and Deming Drive must negotiate a dog-leg maneuver over a short section of Lincolnway, where frequent driveways present conflicts to through traffic.

South of Lincolnway, Deming Drive passes through two railroad underpasses which restrict lateral clearance and sight distance. Just south of the larger underpass Deming intersects with Parsley Boulevard in the middle of a curve. Approach geometrics are tight and the awkward turn movements result in lane encroachment.

Along Deming south to 9th Street there are several intersecting streets and driveways which present conflicts with through traffic. Parking adjacent to the roadway is uncontrolled, and parked vehicles often encroach the traveled way.

The intersection of Deming and 9th Street does not provide for separate turn lanes for either south to east or west to north movements, which are the major movements along the arterial. The bridge over Crow Creek is narrow, with only one lane in each direction.

Central and Warren Avenues are both located close to I-180, which often causes turn lane blockage and delay for local traffic at this signalized intersection.

Roadway surface, especially valley gutters, on 9th Street is inadequate for large volumes of traffic and will require upgrading when the viaduct connection to Logan is implemented.

2.5.3 Planned/Programmed Improvements

Reconstruction of Ames Avenue from Lincolnway south to the first underpass is planned as a City 1 percent optional sales tax project for 1985-86. This will facilitate movement in the north-south direction between South Cheyenne and the area west of downtown, including connections to Warren AFB via Missile Drive.

A longer range project (1988 or beyond) being considered is extension of Missile Drive South from Lincolnway over the railroad tracks to connect with Deming Drive. Such link would provide good direct connections between South Cheyenne and Warren AFB, I-25 north and the northwest part of the City. However, it could require both substantial new development in South Cheyenne and major upgrading of connecting arterial streets (Deming Drive, Parsley Blvd., Fox Farm Road) to be effective.

2.5.4 Alternative Improvement Actions

The long range concept of extending Missile Drive south requires substantial detailed study to determine both the constructability of such a roadway and its relative cost-effectiveness. Substantial new development in South Cheyenne would be required to warrant such a project.

The 1982 South Cheyenne Traffic and Inner Drive Feasibility Study (Noblitt and Associates) recommended upgrading of this corridor to a level consistent with its designation as a minor arterial. In addition to roadway widening of Deming and 9th, major project elements include the viaduct connection between Logan and 9th, and widening the Crow Creek bridge -- this should also include realignment of the Deming/9th connection to eliminate the right angle turn.

2.5.5 Recommended Improvements Plan

Short term improvements which are consistent with the long range plan include intersection upgrading and minor street widening. To take advantage of the signal upgrade at Ames, consideration should be given to closing Ames north of Lincolnway, and closure of the local street which runs south from Lincolnway just east of Crow Creek. This street can remain open at Deming to provide access. Lincolnway and Deming should have curb and gutter in this area.

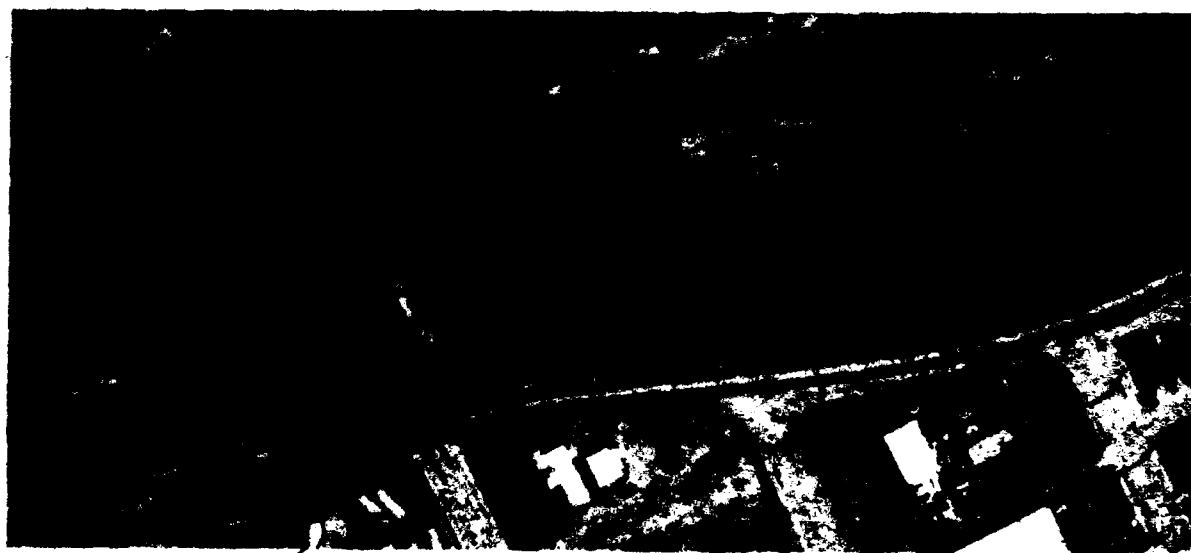
The Deming/Parsley intersection should be upgraded in stages, beginning with approach widening and improved channelization to better control the now awkward turning movements. Eventually the approaches should provide two through lanes plus separate turn lanes.

Selective street closures along Deming should be considered, beginning with Thomes which intersects Deming in the middle of a curve. Satisfactory local access can be provided from 10th and 11th Streets.

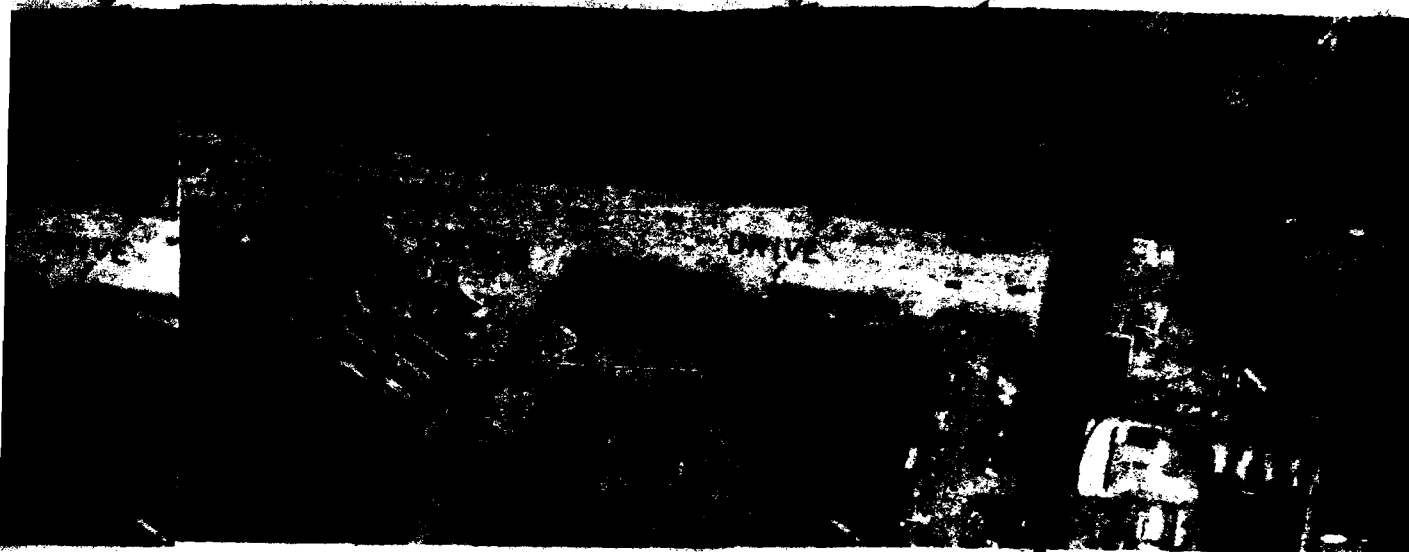
①



ADT { ← 2,700 N
S 2,200 →



CL
EL
M



AMES



LINCOLN { ← 2,700 N
S 2,200 →

LINCOLNWAY

SIG
TO H
CON
LIN
CON
ST
OPE
CUR
IN

AMES



SIGNAL AT AMES BEING UPGRADED
TO IMPROVE FLOW ON LINCOLNWAY.
CONSIDER CLOSURE OF AMES AT
LINCOLNWAY, VACATION OF STREET.
CONSIDER CLOSURE OF ACCESS
STREET AT LINCOLNWAY, LEAVE
OPEN AT DEMING.
CURB & GUTTER, CONTROLLED ACCESS
IN LINCOLNWAY AND DEMING

ADT 9,100

IMPROVE APPROACH
PARSLEY INTERSEC

- WB DEMING: LANE TO COME IN CURVE.
- EVALUATE CROWN RECONSTRUCTION
- LONG RANGE, MISSILE DRIVE STUDY POTENTIAL TO SOUTH, ELIMINATE CROW CREEK C



LONG RANGE, WIDEN BRIDGE
OVER CROW CREEK FOR
DEMING/9TH CONNECTION

9TH STREET

A Professional Corporation

ARIX

Engineers Architects Planners

Greely, Colorado
Grand Junction, Colorado
Silverton, Wyoming
Orem, Utah

CHEYENNE

CORRIDOR 5

1" = 200'

ADT 9,100

PARSLEY BLVD.

ING UPGRADED
LINCOLNWAY,
OF AMES AT
ON OF STREET.
E OF ACCESS
GER, WIDWAY, LEAVE
ISATE FOR
ROLLED ACCESS
DEMING
CREEK B
AND WID
SIDER N-
PARSLEY
FOR MA
ATION OF
BBINGS

IMPROVE APPROACH GEOMETRICS ON DEMING AT
PARSLEY INTERSECTION.

- WB DEMING: LONGER, WIDER LEFT TURN
LANE TO COMPENSATE FOR INTERSECTION
IN CURVE.
- EVALUATE CROW CREEK BRIDGES FOR
RECONSTRUCTION AND WIDENING.
- LONG RANGE, CONSIDER N-S VIADUCT FROM
MISSILE DRIVE TO PARSELEY BLVD. OVER TRACKS.
STUDY POTENTIAL FOR MAJOR ACCESS ROUTE
TO SOUTH, ELIMINATION OF CONFLICTS WITH
CROW CREEK CROSSINGS.

LONG RANGE, WIDEN BRIDGE
OVER CROW CREEK FOR
DEMING/9TH CONNECTION

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

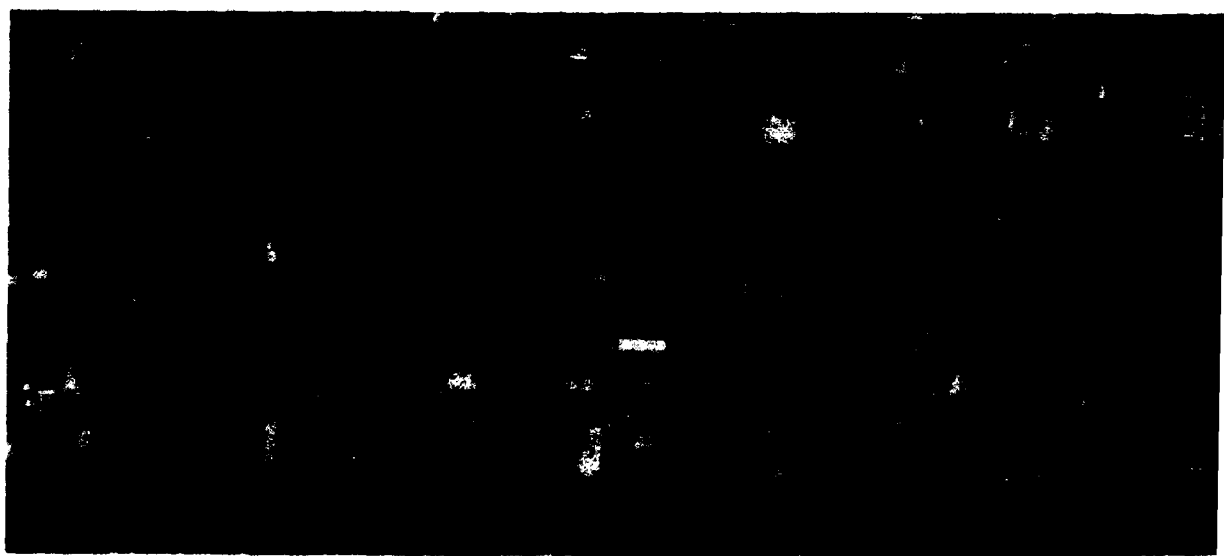
CORRIDOR 5 - MISSILE DRIVE/LINCOLNWAY/
DEMING/9TH STREET

HAPPY JACK TO DUFF

1"=200'

5A

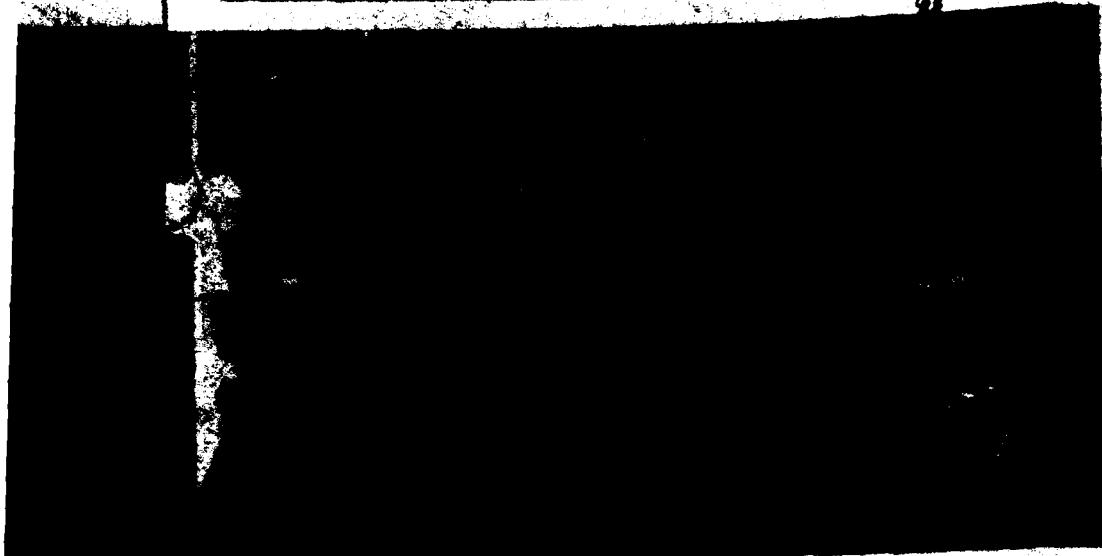
DECEMBER, 1984



POSSIBLE FUTURE WIDENING OF 9TH S
FROM I 180 TO NEW VIADUCT TO M
TRAFFIC DEMANDS ON MINOR ARTERIAL



PROXIMITY OF CENTRAL &
WARREN AVENUES TO I-180
CAUSES INTERSECTION BLOCKAGE



CENTRAL &
IES TO I-180
ECTION BLOCKAGE



PLANNED UPGRADE C
VIADUCT AND CONNEC
BETWEEN LOGAN & 9

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Greeley Junction, Colorado
Riverston, Wyoming
Orem, Utah

CHEY

CORRI

1" = 200'



PLANNED UPGRADE OF
VIADUCT AND CONNECTION
BETWEEN LOGAN & 9TH



(4)

A Professional Corporation

ARIX

Engineers Architects Planners

Greely, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Ogden, Utah

CHEYENNE IMPACT CORRIDOR STUDY

**CORRIDOR 5 - MISSILE DRIVE/LINCOLNWAY/
DEMING/9TH STREET**

HAPPY JACK TO DUFF

1" = 200'

5 B

DECEMBER, 1984

NE IMP

5- MISS
DEM

HAPPY

2.6 LOGAN AVENUE - Pershing to 5th/Duff

2.6.1 Existing Conditions

Logan Avenue is a two lane, two way street classified as a collector between Pershing and Lincolnway, and as a minor arterial between Lincolnway and the north end of the railroad viaduct, near 8th Street. The section between the viaduct and 5th Street, on the extension of Duff Avenue, is unclassified.

Signalized intersections include Pershing, 20th and 19th Streets, Lincolnway and Nationway. Adjacent land uses range from low density residential, at the north end, to strip commercial and industrial south of the 19th/20th Street intersection.

Most intersection approaches are one lane, to handle all movements. Between 19th and 20th Streets there are short back-to-back left turn lanes to facilitate turns to the one-way pair. The northbound approach to Pershing has two lanes, marked for exclusive left turn and left plus right turns at the tee intersection. Left turn lanes are provided at Lincolnway, but are poorly marked.

Some sections have irregular or deteriorated curb and gutter at varying distances from centerline. Parking is generally provided between Nationway and Pershing, except at intersection approaches.

Reported accidents at key intersections are:

- Lincolnway - (1981 - 17; 1982 - 14; 1983 - 10)
- 19th Street - (1981 - 11; 1982 - 8; 1983 - 9)
- 20th Street - (1981 - 8; 1982 - 3; 1983 - 2 or less)
- Nationway - (1981 - 7; 1982 - 6; 1983 - 7)
- Pershing Boulevard - (1981 - 6; 1982 - 7; 1983 - 2 or less)
- 11th Street - (1981 - 2 or less; 1982 - 2 or less; 1983 - 4)

2.6.2 Traffic Operations Problems

The northbound approach to Pershing is the stem of a tee intersection, and all movements are either right or left turns, which reduces capacity. The right turn is approximately 120 degrees through a small radius curve, further reducing capacity. Because of the schools located in the north side of Pershing, an exclusive pedestrian phase (north-south across Pershing and east-west across Logan) is provided, which diminishes capacity even further during periods of high pedestrian traffic. The signal displays north bound are red/yellow/green balls, and a ground mount lane control sign is located on the north side of Pershing opposite Logan.

The back-to-back left turn lanes between 19th and 20th Streets are short, affording only four or five vehicles worth of storage capac-

ity, and the north to west left turn lane is on a grade, which causes problems in inclement weather. Because 19th Street east of Logan is a median divided parkway, the south to east left turn movement is awkward, with drivers having to enter the intersection and wait for a gap.

Left turns are restricted at the Lincolnway approaches due to the narrow roadway width, and maneuvers are not precise because pavement markings are obscure.

The left turn movements at Nationway must cross behind each other due to the separation caused by the median on Nationway, and the narrow space provided for through/left movements from Logan. Right turns are relatively easy from the north, since an exclusive lane is provided, but right turns from the south must be made from the through lane.

The "Logan" and 10th Street openings on the east side of Logan just north of Nationway permit awkward left turns northbound, across north bound traffic at skewed angles.

2.6.3 Planned/Programmed Improvements

A project is being considered to increase the capacity of 19th Street eastbound from Logan to Converse (see Section 2.4.3). Improvements to 20th Street westbound are also recommended (see Section 2.4.5). These might reduce the 19th/20th Street left turn demand by a small amount.

Longer range, the "Logan" viaduct is planned to be upgraded and connected to 9th Street as part of the south side minor arterial peripheral route. These improvements could make Logan a more attractive route to bypass the CBD; upgrading of some critical intersections would then be warranted even more strongly.

2.6.4 Alternative Improvement Actions

Logan generally functions satisfactorily except at key intersections; the through capacity of the street, even with one lane in each direction is adequate to handle 10,000 - 12,000 ADT. However, intersection capacity is now inadequate and will be a more serious problem as traffic increases. Street widening to accommodate four lanes plus parking (nominally 64 ft. pavement width) should be considered as the next step following viaduct reconstruction. This would alleviate the problem of irregular curb and gutter and provide better control of the on-street parking. The alternatives considered for the near term focus on intersection treatments.

2.6.5 Recommended Improvement Plan

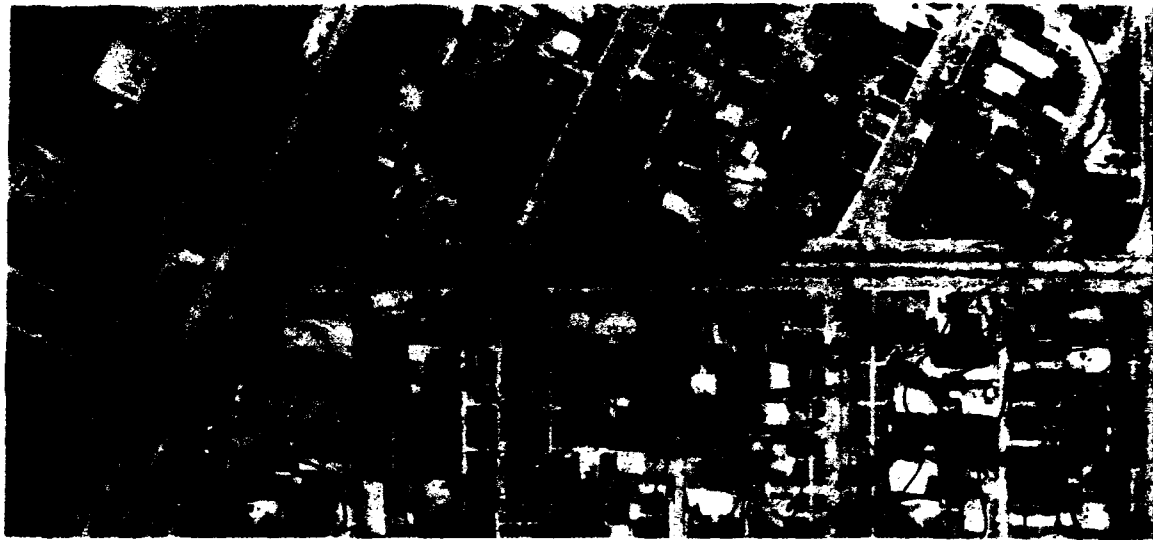
The exclusive pedestrian phase at Pershing should be maintained to provide protection for school children crossing these busy streets. Since the pedestrian phase is activated, capacity loss is somewhat limited. To facilitate traffic flow northbound, and alert drivers to the available movements, the green balls should be replaced with

green arrows (two left, one right). Overhead lane use control signs should be installed on the mast arms to replace the ground mount sign which is not easily perceived by approaching traffic.

The intersection approaches with Lincolnway should be widened as part of the Lincolnway improvements (see Section 2.3.5). In anticipation of future Logan widening to four lanes, the approaches should be widened to this ultimate section, and marked for left turn, through only and right only. The right turn lane eventually would function as a right plus through lane. Also, the Albany Avenue curb cut should be closed at Logan, although local access from 15th Street would remain.

The access points at "Logan" and 10th Street, on the east side just north of Nationway, should be closed, with local access in 11th Street.

The Nationway intersection should be reconstructed to permit left turns, exclusive right turns, and two through lanes. Raised channelization on Nationway and the Logan islands should be provided. Even if the viaduct is only one lane in each direction, the Logan approaches should provide two through lanes to increase capacity. Considering the relative cost of structures compared to surface roadways, a two lane, two-way viaduct with four lanes at each end is a feasible option to consider. One free flowing lane of traffic with minimal side friction, such as a viaduct lane, can deliver all the volume a signalized intersection can comfortably handle, even with four movements permitted (left, two through, right) on the exit approach from the viaduct.



MAINTAIN ALL PEDESTRIAN CROSSING PHASE NS
& E-W AT PERSHING. REPLACE GREEN ● IN NB MAST
ARM WITH GREEN ← LT ARROW; REPLACE GREEN ●
ON NB POLE WITH GREEN → RT ARROW. REPLACE
GROUND MOUNT NB LANE USE CONTROL SIGN WITH
MAST ARM LANE USE CONTROL SIGNS



PLANNED UPGRADE OF VIADUCT AND CONNECTION
TO 9TH STREET TO COMPLETE SOUTH SIDE MINOR
ARTERIAL CONNECTION FROM WEST SIDE TO EAST
SIDE OF CBD, PER FUNCTIONAL CLASSIFICATION
PLAN

RE
INT
ME
LOA
SB
LT



5,200

ADT 5,200

ADT 9,400

PHASE NS
EN • IN NB MAST
REPLACE GREEN •
ROW. REPLACE
POL SIGN WITH

UPGRADE CURB
AS PART OF LOG
IMPROVEMENTS





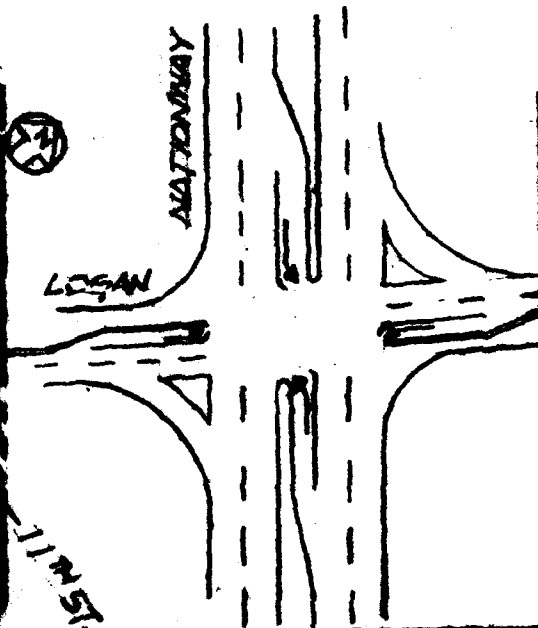
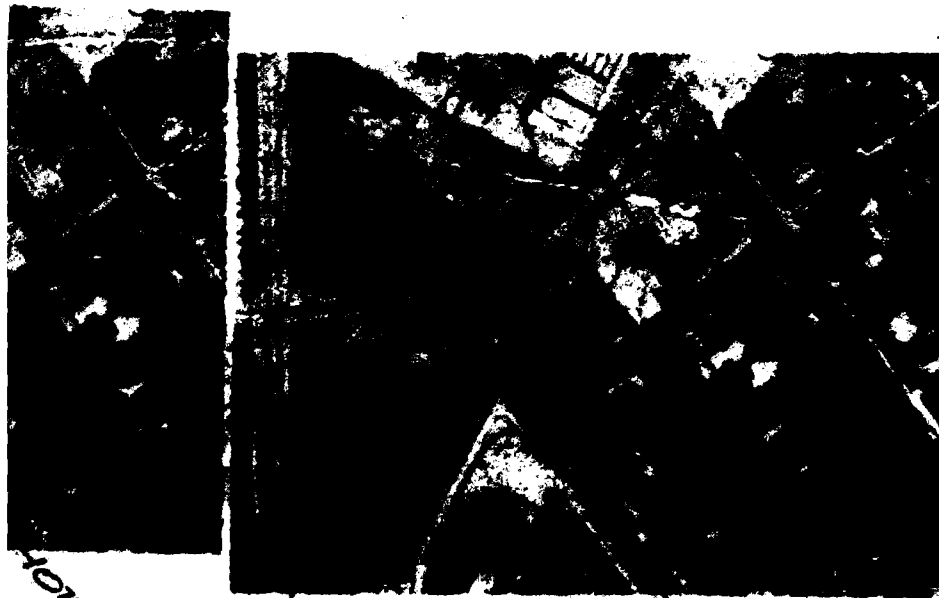
ADT 9,400

GUTTER ON
LINCOLNWAY
SEE CORRIDOR

UPGRADE CURB AND GUTTER ON LOGAN
AS PART OF LOGAN/LINCOLNWAY INTERSECTION
IMPROVEMENTS (SEE CORRIDOR 3, FIGURE 3B)

CLOSE
CURB

SEE F
5TH ST,



CLOSE ACCESS TO LOGAN SOUTH
OF 11TH ST. TO NATIONWAY, AS
PART OF INTERSECTION WIDENING
AT NATIONWAY

A Professional Corporation

ARIX

Engineers Architects Planners

Boulder, Colorado
Grand Junction, Colorado
Nederland, Wyoming
Orem, Utah

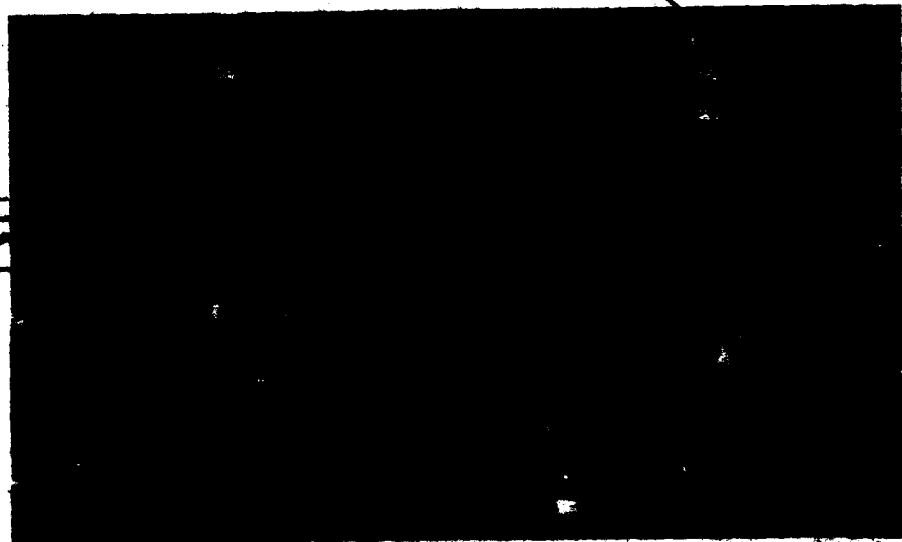
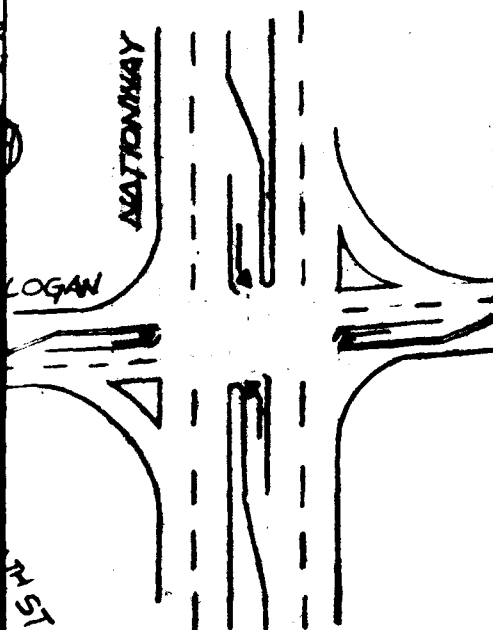
CHEY

1" = 200'

CONSIDER WIDENING LOGAN
 APPROACHES TO 4 LANE PLUS LT,
 MARKED AS L ONLY, THROUGH ONLY,
 R ONLY FOR THE INTERIM

CLOSE ALBANY AVE.
 CURB CUT

SEE FIGURE 9 B FOR
 5TH ST/DUFF IMPROVEMENTS



CHEYENNE IMPACT

CORRIDOR 6

PERSHING TO

A Professional Corporation

ARIX

Engineers Architects Planners

Greely, Colorado
 Grand Junction, Colorado
 Riverton, Wyoming
 Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 6 - LOGAN AVENUE

PERSHING TO 5TH/DUFF

1" = 200'

6

DECEMBER, 1987

2.7 RANDALL/PIONEER-CAREY - Pershing to Lincolnway

2.7.1 Existing Conditions

Randall Avenue from Pershing Boulevard to Pioneer Avenue/Carey Avenue is a two lane, two-way minor arterial. This roadway is approximately 0.9 mile long with adjacent land use being primarily established residential. There is some commercial activity, and both land uses contribute to traffic on Randall Avenue. Speed limit is 30 mph. There is a designated school crossing with 20 mph from 8:00 a.m. to 4:30 p.m. at O'Neil Avenue. On-street parking is allowed on both sides of Randall Avenue. Because Randall Avenue cuts across the original city blocks at a 45° angle there are several complicated intersections (six approaches at some locations) with awkward geometrics.

Randall Avenue is 45 ft. wide in an 80 ft. right-of-way. There are two traffic signals with two phase operations, one at Pershing Boulevard (traffic actuated), and one at Snyder Avenue (pre-timed)

Reported accidents at major locations are:

- ° Pershing Boulevard - (1981 - 2 or less; 1982 - 2 or less; 1983 - 2 or less)
- ° Snyder Avenue - (1981 - 2 or less; 1982 - 2 or less; 1983 - 4)

The Carey Avenue/Pioneer Avenue corridor continues south from Randall Avenue to Lincolnway as a minor arterial one-way pair for approximately 0.7 mile. This section is located in the Central Business District which includes State, Federal, and City offices as well as commercial land use. Adjacent land use generates significant volumes of traffic on this corridor. Speed limit is 20 mph and right-of-way is 80 ft. with street widths of:

Carey Avenue:

Randall Avenue to Alley south of 22nd Street	- 45 ft.
Alley south of 22nd Street to 20th Street	- 51 ft.
20th Street to Lincolnway	- 53 ft.

Pioneer Avenue:

Randall Avenue to 20th Street	- 45 ft.
20th Street to Lincolnway	- 51 ft.

Both streets carry three traffic lanes through the CBD, with two traffic lanes on Pioneer Avenue from Randall Avenue south to the transition between 19th/20th Streets. On-street parking is generally permitted on both sides of both streets but is restricted by either meters or signs. There are several signals located in this corridor:

- ° On Carey Avenue at 25th Street (proposed), 24th Street, 20th Street, 19th Street, 18th Street, 17th Street, and at Lincolnway
- ° On Pioneer Avenue at 24th Street, 20th Street, 19th Street, 18th Street, 17th Street and at Lincolnway.

Reported accidents at major locations are:

- ° Carey Avenue at 22nd Street - (1981 - 2 or less; 1982 - 4; 1983 - 3)
- ° Carey Avenue at 21st Street - (1981 - 4; 1982 - 2 or less; 1983 - 3)
- ° Carey Avenue at 20th Street - (1981 - 2 or less; 1982 - 3; 1983 - 2 or less)
- ° Carey Avenue at 19th Street - (1981 - 2 or less; 1982 - 5; 1983 - 4)
- ° Carey Avenue at 18th Street - (1981 - 4; 1982 - 2 or less; 1983 - 2 or less)
- ° Carey Avenue at 17th Street - (1981 - 6; 1982 - 8; 1983 - 15)
- ° Pioneer Avenue at Randall Avenue - (1981 - 2 or less; 1982 - 3; 1983 - 2 or less)
- ° Pioneer Avenue at 24th Street - (1981 - 4; 1982 - 3; 1983 - 2 or less)
- ° Pioneer Avenue at 19th Street - (1981 - 2 or less; 1982 - 8; 1983 - 10)
- ° Pioneer Avenue at 17th Street - (1981 - 2 or less; 1982 - 2 or less; 1983 - 5)

2.7.2 Traffic Operations Problems

At Snyder Avenue there are no separate left turn lanes in any direction. As a result, left turners block the through lanes and cause delays. The valley pan on the north side of the intersection reduces capacity because vehicles have to slow down to proceed northbound in a safe manner.

The intersection of Randall Avenue and Pioneer Avenue at 27th Street has six approaches and Randall Avenue intersects Pioneer Avenue at a 45° angle. There are confusing movements, numerous conflicts and short storage areas forcing drivers to stop twice while crossing the intersection. Left turns are a problem because there are no separate left turn lanes. Some movements have restricted sight distances and very short storage areas. Lack of access control causes problems because driveways are too close to the intersection.

The intersection with Carey Avenue and 26th Street has five legs and poor geometrics. Motorists northbound to westbound Randall Avenue are unsure whether this is a dual left turn or a single left turn. Northbound vehicles from 24th Street and the Herschler Building try to weave over to turn left onto Randall Avenue creating weaving conflict with northbound through traffic.

Carey Avenue from Pershing Boulevard to Lincolnway has two problem locations. One is at the intersection of 24th Street, which during the evening peak hour is congested by heavy traffic from state office buildings. Heavy pedestrian movements during this period create conflicts between vehicles and pedestrians.

The second location is the intersection of 17th Street. There is a high accident rate here resulting from the dual right turn movement for westbound traffic to northbound Carey Avenue. Accidents often occur when vehicles in the outside lane do not make a right turn but proceed straight through the intersection, conflicting with vehicles making a right turn from the inside lane.

The intersection of Pioneer Avenue and 19th Street has a relatively high accident rate. The primary problem appears to be caused by vehicles southbound on Pioneer maneuvering left to turn east on 19th Street. At the intersection of Pioneer and Lincolnway some southbound drivers are not sure whether left turns can be made from only one lane or from two lanes. Pavement markings indicate that left turns can only be made from one lane. The three phase signal causes some confusion as to when a right turn on red should be made northbound. The pedestrian indicator for pedestrians crossing Lincolnway is not standard. There is also an offset in lane lines for southbound traffic that causes weaving conflict.

2.7.3 Planned/Programmed Improvements

As noted in section 2.1.3, the reconstruction of the Randall/Pershing/I-25 interchange will improve traffic operations at the north end of this corridor. The City has plans to reconstruct the Pioneer/Randall intersection in 1985 or 1986, to improve traffic flow through the intersection and reduce turning/weaving/merging conflicts.

2.7.4 Alternative Improvement Actions

Portions of the traffic demand on Randall Avenue are related to travel to and from F.E. Warren AFB. Alternatives to address this situation are presented in Section 2.1 which discusses the Pershing Boulevard corridor. The remaining traffic operations problems on the Randall/Pioneer-Carey corridor involve congested intersections, where capacity is lost to turn conflicts and weaving movements. One option for relieving these is to change travel patterns, to divert certain trips to alternate routes. However, the level of effort required, especially in an area where trips are relatively short and there is very little control of driver behavior, is probably not worth the minor benefits which could be realized. A more cost-effective approach is to focus on a few critical bottlenecks, to relieve operating problems there.

2.7.5 Recommended Improvement Plan

The signalized intersection with Snyder Avenue should be considered for adding left turn lanes on all four approaches. These can be accomplished by remarking the pavement, and prohibiting parking for a

short distance back from the intersection. Providing space to store one or two turning vehicles on each approach would greatly improve overall level of service at relatively low cost.

Movements through the Pioneer/Carey/Randall - 26th/27th Street area should be prioritized to favor major travel demands and restrict or eliminate minor movements which serve little demand but create conflicts. The major movements which merit priority are:

- Randall southeast to Pioneer southbound
- Carey northbound past Randall
- Carey north to Randall, then northwest on Randall
- Pioneer south past Randall

Closure of 26th Street between Carey and Randall and 27th Street between Pioneer and Randall would eliminate several conflicts, and would not significantly affect local access and circulation.

Other skewed intersections along Randall should be reviewed for similar closures or turn restrictions. Local access can be preserved with only one or two additional blocks of travel distance added to trips. Bent and 30th Street, and Dillon and 31st Street are candidates for such treatment.

On Pioneer southbound and Carey northbound, at the approaches to cross-streets from 20th to Lincolnway, overhead lane use control signs should be installed to supplement pavement markings. Intersections of one-way/one-way streets should permit only one turning lane, to eliminate the sideswipe conflict which results from double turn lanes, especially when the inside turn lane is an optional turn/through movement.

The exclusive pedestrian phases in the CBD should be eliminated, since they consume a great deal of vehicle capacity and do not provide a proportional benefit to pedestrian movement. Also, pedestrian signals should be upgraded and standardized. The non-standard pedestrian signal across Lincolnway at Pioneer should be replaced.



31

REVIEW ALL SKEWED AND/OR
MULTILEGGED INTERSECTIONS FOR
POSSIBLE STREET CLOSURE OR
TURN PROHIBITION ALONG RANDALL

IMPLEMENT PLANNED IMPROVEMENT
TO I-25 INTERCHANGE



27TH ST.

26TH ST

PIONEER

PLANNED IMPROVEMENTS TO RANDALL/
PIONEER SHOULD BE IMPLEMENTED.
CONSIDER CLOSURE OF 27TH STREET
AT PIONEER/RANDALL

ST.

31ST ST.

ADT 4,900 - ADT 5.

ALL SKEWED AND/OR
GGED INTERSECTIONS FOR
E STREET CLOSURE OR
ROHIBITION ALONG RANDALL

ENT PLANNED IMPROVEMENTS
S INTERCHANGE

DI
LA
AT

CLOSE 26TH
CAREY & RA
26TH AT RAN



26TH ST

PIONEER

CAREY

MENTS TO RANDALL/
E IMPLEMENTED.
S OF 27TH STREET
ALL

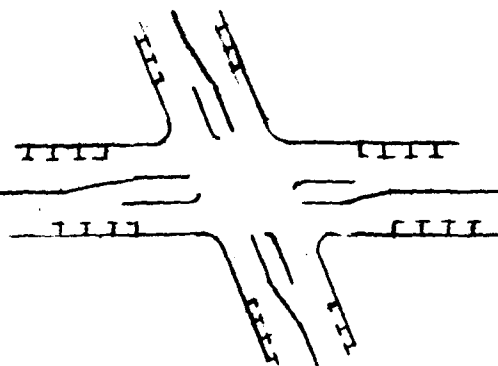
S ADT 4,900 — ADT 5,600

SNYDER

30TH ST.

DEVELOP SHORT
TURN LANES
AT SNYDER

DEVELOP SHORT
LEFT TURN LANES
AT SNYDER



STREET BET.
CAREY & RANDALL, CLOSE
26TH AT RANDALL

CLOSE 26TH STREET BETWEEN
CAREY & RANDALL, CLOSE
26TH AT RANDALL



A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHE

CO

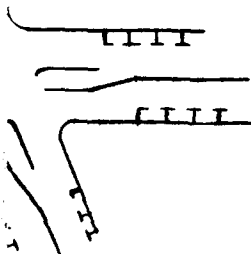
1" = 20'



30TH ST. ↗

BENT ↗

O'NEIL ↗



Professional Corporation

ARIX

Engineers Architects Planners

Fort Collins, Colorado
and Junction, Colorado
Garden, Wyoming
Boulder, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 7 - RANDALL/PIONEER-CAREY

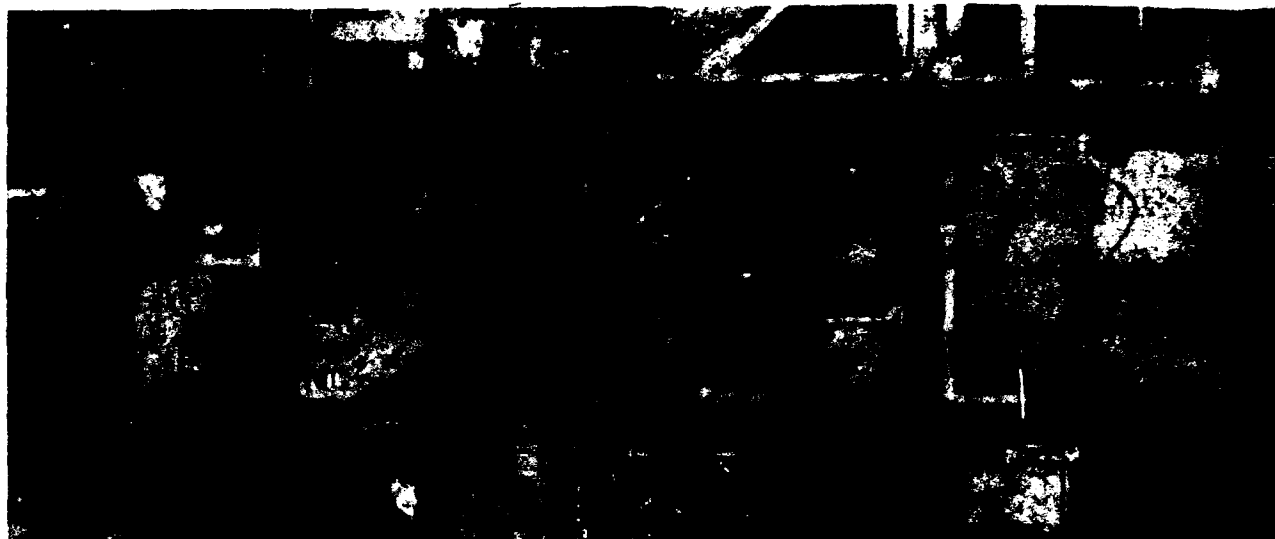
PERSHING TO LINCOLNWAY

1" = 200'

7 A

DECEMBER 1984

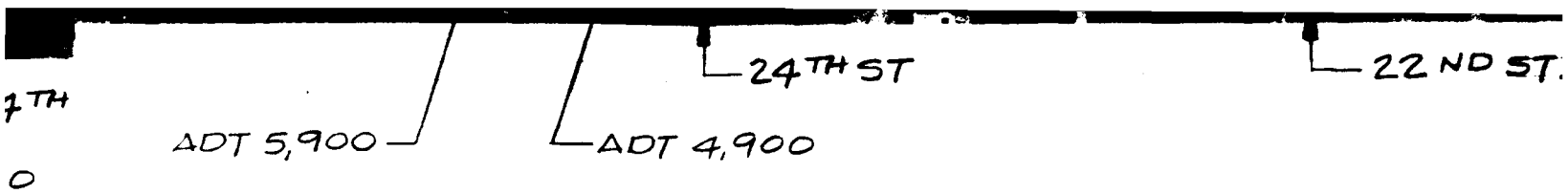
①



— RANDALL AVE.

ADT 5,900 —

— ADT 4,



- UPGRADE AND TRAFFIC SIG
- INSTALL OVER ON MAST ARM INTERSECTIO CAREY/ 20TH

EXAMPLES

22ND ST.

20TH ST.

19TH ST.

ADT 6,100

ADT 6,000

- UPGRADE AND STANDARDIZE PEDESTRIAN TRAFFIC SIGNALS
- INSTALL OVERHEAD LANE USE CONTROL SIGNS ON MAJOR ARMS, ESPECIALLY AT 1-WAY INTERSECTIONS (PIONEER/20TH, 19TH, 17TH; CAREY/20TH, 19TH, 17TH)

- REMOVE EXCESSIVE CBD SIGNALS
- ELIMINATE THROUGH TRAFFIC SIGNALS PLUS THROUGH SIDESWIPES 17TH TO PIONEER

EXAMPLES:



1-WAY TO 2-WAY



1-WAY TO 1-WAY



A Professional Corporation

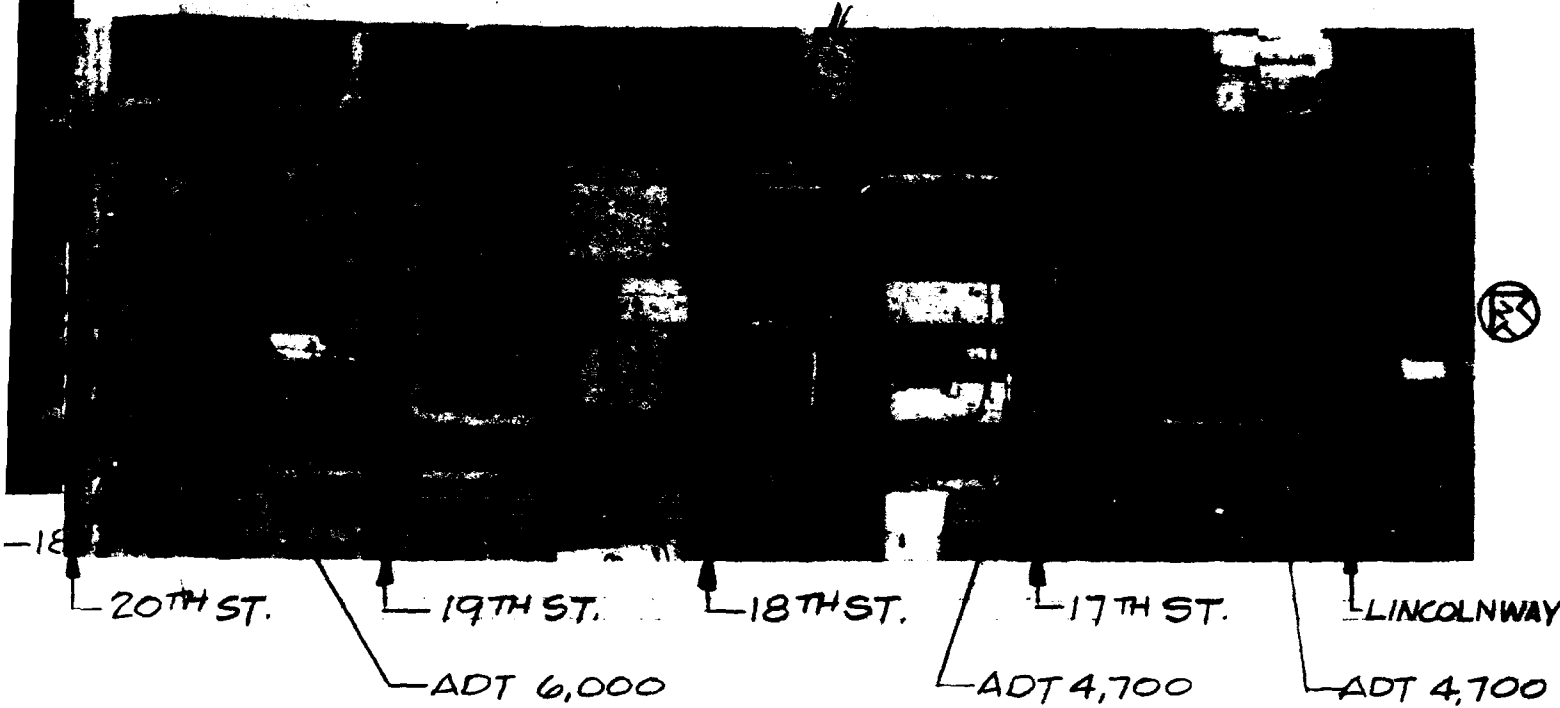
ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

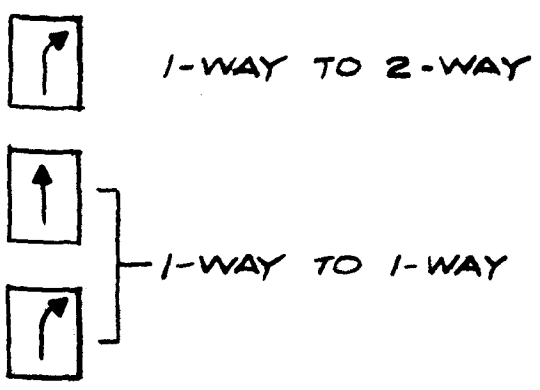
CH

100



IVE
CR
PEDESTRIAN
ION
TO CONTROL SIGNS
SPLIT-WAY
(19TH, 17TH;

- REMOVE EXCLUSIVE PEDESTRIAN PHASES ON CBD SIGNALS; CROSS PEDESTRIANS WITH TRAFFIC MOVEMENT
- ELIMINATE OPTIONAL CENTER LANE TURN PLUS THROUGH TO REDUCE DOUBLE TURN SIDESWIBE CONFLICT AT 17TH TO CAREY (RT), 17TH TO PIONEER (LT), PIONEER TO 19TH (LT)



A Professional Corporation ARIX Engineers Architects Planners Greeley, Colorado Grand Junction, Colorado Riverton, Wyoming Orem, Utah	CHEYENNE IMPACT CORRIDOR STUDY		
	CORRIDOR 7 - RANDALL/PIONEER-CAREY		
	PERSHING TO LINCOLNWAY		
	1" = 200'	7 B	DECEMBER, 1994

2.8 FOX FARM ROAD - Walterscheid to Avenue C

2.8.1 Existing Conditions

Fox Farm Road is a collector throughout the study corridor. It has a two lane, two way paved surface with adequate shoulders. Principal intersections are a four way stop at Walterscheid, a signal controlled intersection with U.S. 85 (South Greeley Highway) and a four way stop at Avenue C. Adjacent land use is either residential or vacant land, except for the Holiday Inn, which is a significant traffic generator located north of Fox Farm just west of U.S. 85. At the U.S. 85 intersection three of the four quadrants have commercial use; the southwest quadrant is occupied by a residence, and is considerably elevated over the adjacent road grade.

The west leg of Fox Farm, approaching U.S. 85 drops steeply, at an approximately 8 percent grade, with a sharp vertical curve close to the intersection. The east leg has a fairly flat approach, less than 3 percent, and good visibility.

The intersection at U.S. 85 has separate right turn lanes on all four approaches, with triangular medians. U.S. 85 has two through lanes in each direction, and marked separate left turn lanes, with raised median channelization. The actuated signal provides two phases, with no separate turn phase. Left turn storage on U.S. 85 appears adequate on both approaches.

Reported accidents at key intersections are:

- ° Fox Farm and U.S. 85 (1981 - 10, 1982 - 15, 1983 - 14)
- ° Fox Farm and Avenue C (1981 - 4, 1982 - 2, 1983 - 3)

2.8.2 Traffic Operations Problems

Operations along the mainline of Fox Farm Road are satisfactory since there are relatively few intersecting streets or driveways on the west end, and the wide shoulders east of U.S. 85 facilitate turning movements without undue delay. Intersection operations at the two stop sign controlled intersections are relatively smooth, although left turning vehicles occasionally delay through traffic. The Fox Farm/Walterscheid intersection is offset somewhat in the east-west direction.

The principal problem location is the U.S. 85 intersection. Since both east and west approaches have only one lane to accommodate through and left turning traffic, the east/west flow of traffic is quite inefficient. False starts in the turn, waiting for the other vehicle to commit, and crowding to the right to move through the intersection were observed. The southbound to eastbound right turn from U.S. 85 to Fox Farm is awkward because the turn angle is about 120 degrees, the exit grade is steep uphill, and there is virtually no room to merge with westbound traffic coming through the intersection.

The eastbound approach on Fox Farm Road faces a very steep grade coming into the intersection, which makes stopping difficult under wet/icy conditions. Sight distance is poor, especially to the right, due to the small hill and approximately 20 percent slope immediately to the right of the roadway approach.

East to north left turns are made difficult by the combination of having to turn about 120 degrees, and having to turn past the north leg median nose, which extends into the left turn path.

2.8.3 Planned/Programmed Improvements

No major improvement projects are being presently considered for this corridor.

2.8.4 Alternative Improvement Actions

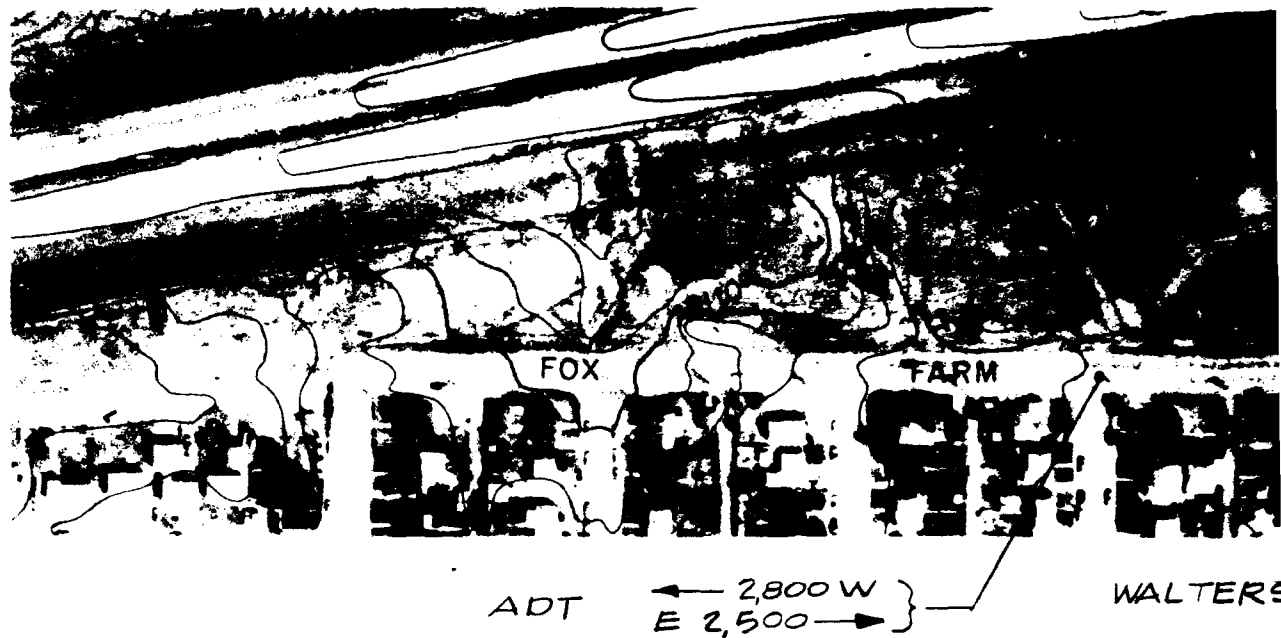
Current and likely future traffic volumes on Fox Farm Road will not warrant more than one lane in each direction for adequate mainline capacity. Emphasis should be on spot improvements at selected locations.

2.8.5 Recommended Improvement Plan

Level of service at the stop sign controlled intersection can be significantly improved by widening the approaches and marking short separate left turn lanes. Considerations should be given to making the intersections two way stops (Walterscheid, Avenue C). An improved right turn lane southbound on Walterscheid should be considered.

Higher priority should be given to the U.S. 85 intersection. Major improvements in level of service could be realized with some relatively modest reconstruction, elements of which include:

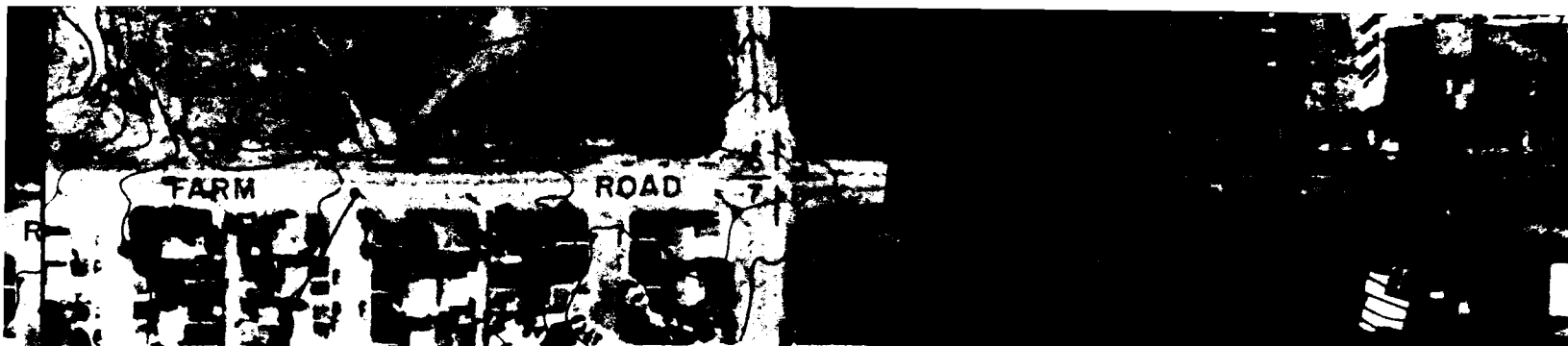
- ° Widen the east and west approaches to permit marking of a separate left turn lane on Fox Farm Road each way. Consideration could be given to removing the right turn channelizing islands in the northeast and southwest quadrants. The right turns are easy 60 degree movements and do not require as large an effective radius as do the 120 degree right turns in the other quadrants.
- ° Reduce the approach grade on the west leg to 6 percent. This will require cutting down the roadway for some distance. The east driveway at the residence in the southwest quadrant is not absolutely necessary and could be rerouted to the west or closed. Curb and gutter is recommended for a short distance back from the intersection so positive drainage can be obtained.
- ° Increase the effective radius of the south to west right turn from U.S. 85 to Fox Farm, and provide a longer merging taper westbound.
- ° Relocate the median nose on the north leg to ease the east to north left turn path.



CONFIRM WARRANT FOR 4-1
STOP AT WALTERSCHEID; REM
IF FEASIBLE. PROVIDE 2-W
STOP ON WALTERSCHEID,
E-W LEFT TURN LANES ON FO
S.T.O W. RT LANE ON WALTER



ESTABLISH AND MAINTAIN ACCESS CONTROL
ON RURAL COLLECTOR ROADS, CONSOLIDATE
DRIVEWAYS AND LOCAL ACCESS INTERSECTIONS

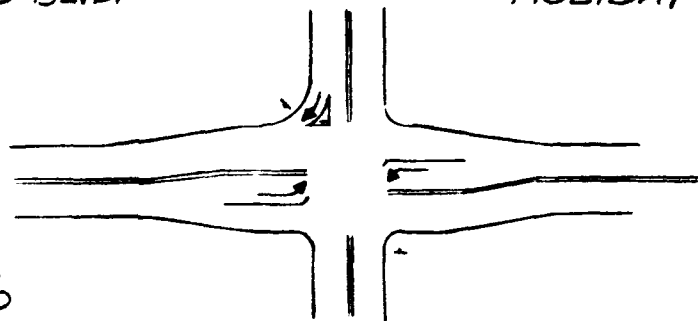


100 W
HEO →

WALTERSCHEID BLVD.

HOLIDAY INN

CONFIRM WARRANT FOR 4-WAY
STOP AT WALTERSCHEID; REMOVE
IF FEASIBLE. PROVIDE 2-WAY
STOP ON WALTERSCHEID,
E-W LEFT TURN LANES ON FOX FARM,
E-W TO W. RT LANE ON WALTERSCHEID



61

611

60



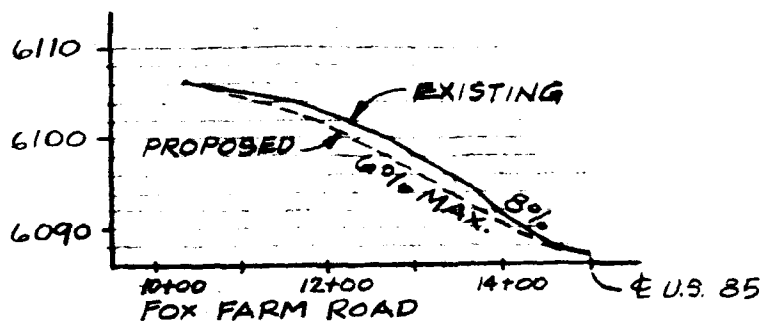
ROAD



HOLIDAY INN

U.S. 85
SOUTH GREELEY HIGHWAY

ADT
{ N }



RECOMMENDED LAY
FOX FARM/U.S. 85



3,800

AVENUE C

A Professional Corporation

ARIX

Engineers Architects Planners

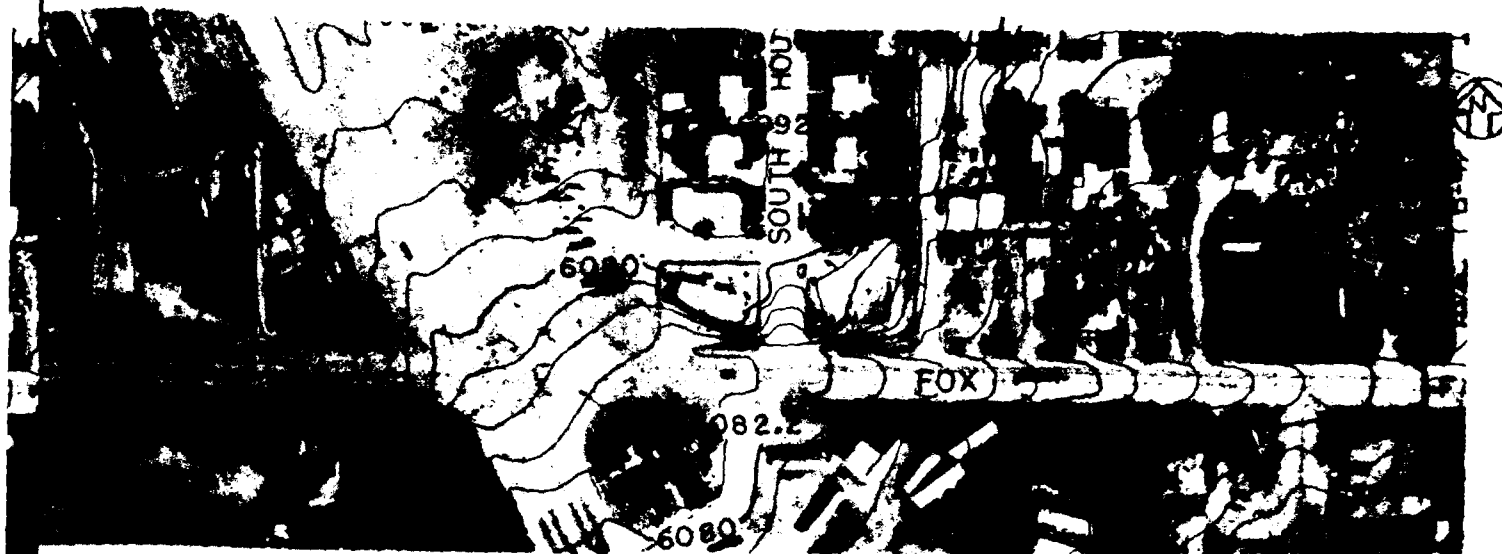
Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMP

CORRIDOR

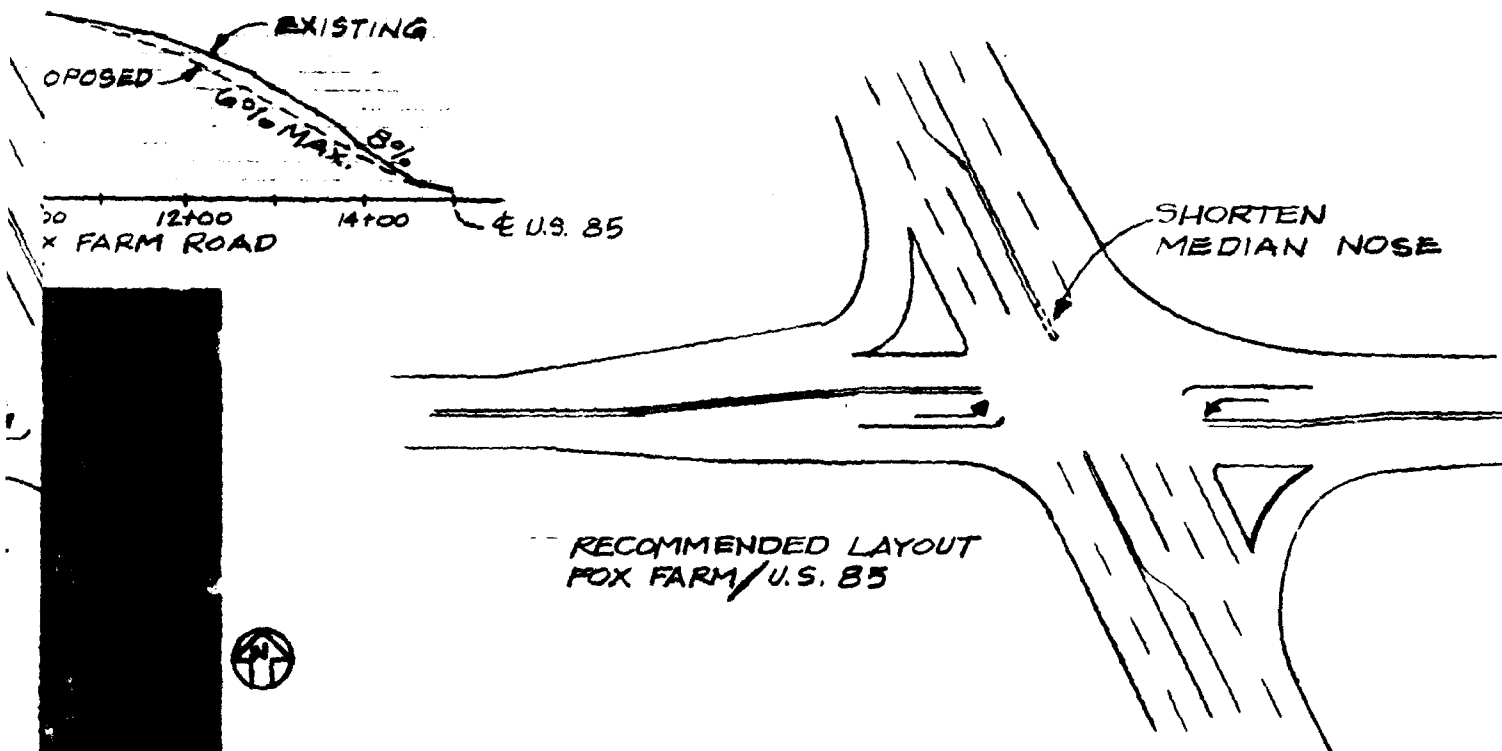
WALTERSCH

1" = 200'



U.S. 85
SOUTH GREELEY HIGHWAY

ADT { 6,000 S
 (N 7,600



A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 8 - FOX FARM ROAD

WALTERSCHEID TO AVENUE C

1" = 200'

8

DECEMBER, 1984

2.9 AVENUE C/MORRIE AVENUE - College Drive to 5th and Duff

2.9.1 Existing Conditions

The Avenue C/5th Street Corridor is classified as a collector route. The south 1 mile of Avenue C from College Drive to Fox Farm Road is a two lane, two way street. There is curb and gutter on the west side with a gravel walking path behind the curb. There is unimproved shoulder on the east side. On-street parking is not allowed. There are two school crossings, at Jefferson Road and Reiner Court which serve children walking to/from Arp Elementary School. Road width is approximately 32 ft. in an 80 ft. right-of-way. Land use is primarily residential. Speed limit is 30 mph. There are no traffic signals and intersections are controlled by stop signs. Reported accidents at major locations are:

- ° College Drive (1981 - 4, 1982 - 3, 1983 - 5)
- ° Fox Farm (1981 - 4, 1982 - 2, 1983 - 3)

Avenue C between Fox Farm Road and First Street is a two lane, two way street approximately 0.6 mile long with no on-street parking allowed on either side. Road width is approximately 36 ft. in an 80 ft. right-of-way. There is no posted speed limit on this section and adjacent land is vacant. There are no traffic signals in this section and right-of-way is controlled by stop signs. Accidents reported at 1st Street are, 1981 - 3, 1982 - 2 or less, 1983 - 2 or less.

Morrie Avenue north and east of 1st Street to Duff Avenue/5th Street is a two lane, two way street approximately 0.4 mile long. Land use is residential with some on-street parking allowed. Street width varies from 26 feet (1st Street to 5th Street on Morrie Avenue) to 37 feet (Morrie Avenue to Duff Avenue on 5th Street) in an 80 ft. right-of-way. Speed limit is 30 mph. Through traffic must make two right angle turns at Morrie Avenue and 5th Street, and at 5th Street and Duff Avenue. Stop signs are placed to allow through traffic free flow. There are no traffic signals and right-of-way is controlled by stop signs. Reported accidents at major locations are:

- ° 5th and Morrie - (1981 - 6, 1982 - 6, 1983 - 2 or less)
- ° 5th and Duff - (1981 - 5, 1982 - 2 or less, 1983 - 2 or less)

2.9.2 Traffic Operations Problems

Avenue C between College Drive and Fox Farm Road has numerous closely spaced driveways and intersecting cross-streets, and no separate lane for left turns. The two school crossing locations (Jefferson Road and Reiner Court) both delay traffic when pedestrians are crossing. Speed limit signs along this route are missing.

North of Fox Farm Road, speed limit signs are also absent. The intersection with 1st Street has a large paved area with islands and lanes designated with painted lines. When these markings are covered with dirt or snow, or become faded, it is difficult for drivers to see the proper channelization paths.

The intersection of 5th Street and Morrie Avenue is awkward because the main flow of traffic follows either a right turn, northbound to eastbound, or a left turn, westbound to southbound. Traffic approaching eastbound on 5th Street or southbound on Morrie must yield to the turning through traffic, and northbound to westbound left turns are awkward because westbound approaching traffic has the right-of-way. The relatively large paved intersection area and lack of good channelization further compounds the turn conflict problem.

A similar situation exists at 5th Street and Duff Avenue, with the main flow of traffic moving through a turn. However, since the intersection is a tee, and the east leg handles relatively low volumes by stop sign control, the incidence of conflict is not as great.

2.9.3 Planned/Programmed Improvements

A project is being considered for inclusion in the long range improvement program to modify the south end of the Logan Avenue/Duff Avenue viaduct to connect with 9th Street. This would provide continuity to the Deming Drive/9th Street corridor and a better connection between South Cheyenne and the area east of the CBD.

Associated with this is the planned reconstruction of the 5th Street/Duff Avenue intersection to provide a better turning path for through traffic. This project, scheduled by the City for 1985-1986, will improve one of the significant bottlenecks along the corridor.

2.9.4 Alternative Improvement Actions

The relatively modest volumes in this corridor -- substantially less than 8,000 ADT -- require only two lanes for adequate through capacity. The Wyoming Highway Department has investigated the need for intersection illumination at Fox Farm Road and Avenue C, and concluded this was not warranted, although lighting could be installed at local cost. For the near term emphasis should be on spot improvements as noted below.

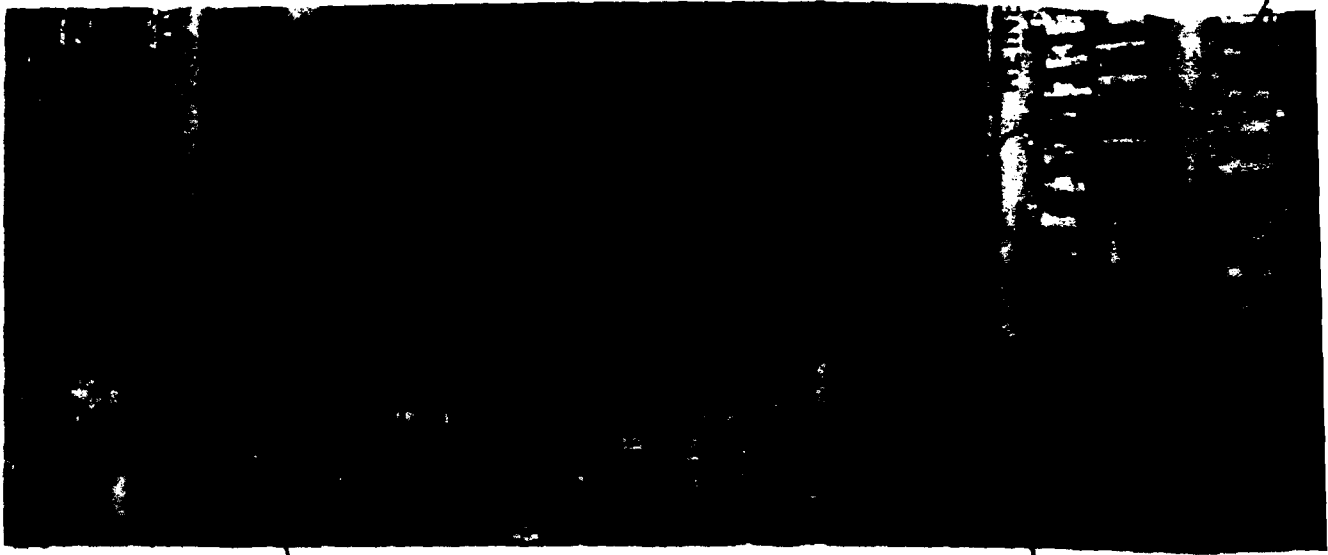
2.9.5 Recommended Improvement Plan

The two school crossings shall be consolidated into one location, preferably at Reiner Court. Upgrading of warning signs and markings should be included. The Avenue C corridor was identified in the South Cheyenne Bikeway Plan as a priority location for bikeway improvement. These could be combined with the school crossing project and related intersection improvements (see below).

Intersection approach widening at Avenue C and College Drive is recommended in Section 2.11.5. A similar treatment is recommended for the intersection of Fox Farm Road and Avenue C, with installation of short left turn storage lanes and approach tapers on all four approaches.

The 1st Street/Morrie Avenue intersection should be considered for raised channelization at some future date. Providing triangular islands to separate turning movements would control traffic flow, provide guidance to drivers under conditions of poor visibility, and separate conflicting movements. In particular, it permits better control of eastbound traffic by delineating the stop location more clearly.

Operations at the Morrie and Duff intersection could be improved with the addition of separate right turn lanes, channelized by raised islands, and separate left turn lanes, back to back on 5th Street between Morrie and Duff. At Morrie, the southbound, eastbound and northbound through/left movements would be stop-sign controlled; northbound to eastbound right, and westbound (all movements) would be free. At Duff, the westbound (all) and southbound left turn movements would be stop sign controlled; southbound right turn and eastbound (all) would be free. Alternatively, Morrie could be closed at 5th, to permit better flow through the intersection for the major movements. Local access would be adequate, and commercial traffic could be kept on appropriate collector/arterial streets out of residential areas.

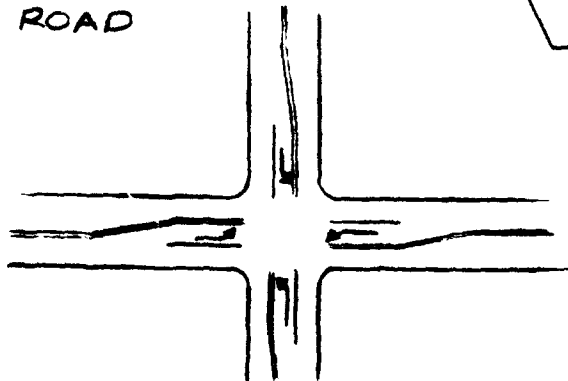


SCHOOL CROSSINGS TO SERVE
ARP SCHOOL AT JEFFERSON ROAD
& REINER COURT



FOX FARM ROAD

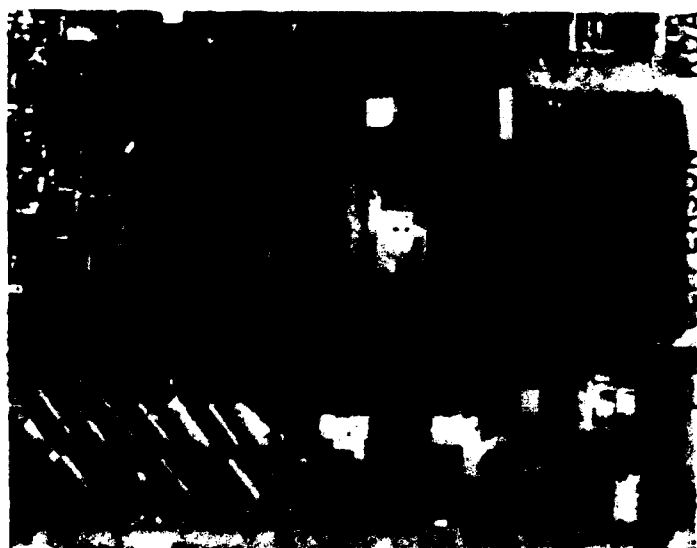
ADT 1,500



ADD LEFT
FOX FARM 1
EVALUATE N
BASED ON W
IF 2-WAY W
PERMIT FREE

CON
ALOI
WES. TO SERVE
JEFFERSON ROAD

CONSIDER EARLY ACTION ON SEPARATE BIK
ALONG AVENUE C, FOX FARM TO COLLEGE,
WEST SIDE. TIE TO IMPROVED SCHOOL CROS



ADT 1,500

N LA
E AVE
FOR
ANTS
ANTE
VEME

ADD LEFT TURN LANE AT
FOX FARM RD & AVENUE C

EVALUATE NEED FOR 4-WAY STOP,
BASED ON WARRANTS OF MUTCD 2.B-6;
IF 2-WAY WARRANTED, STOP AVENUE C,
PERMIT FREE MOVEMENT ON FOX FARM RD.

AY
JGS
ACTION ON SEPARATE BIKEWAY
FOX FARM TO COLLEGE,
TO IMPROVED SCHOOL CROSSINGS

.B-6;
E C
RM RD.

A Professional Corporation ARIX Engineers Architects Planners Greeley, Colorado Grand Junction, Colorado Riverton, Wyoming Orem, Utah	CHEYENNE
	CORRIDOR
	COLLEGE
	1"=200'



COLLEGE DRIVE—

OLLE

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 9 - AVENUE C/MORRIE AVENUE

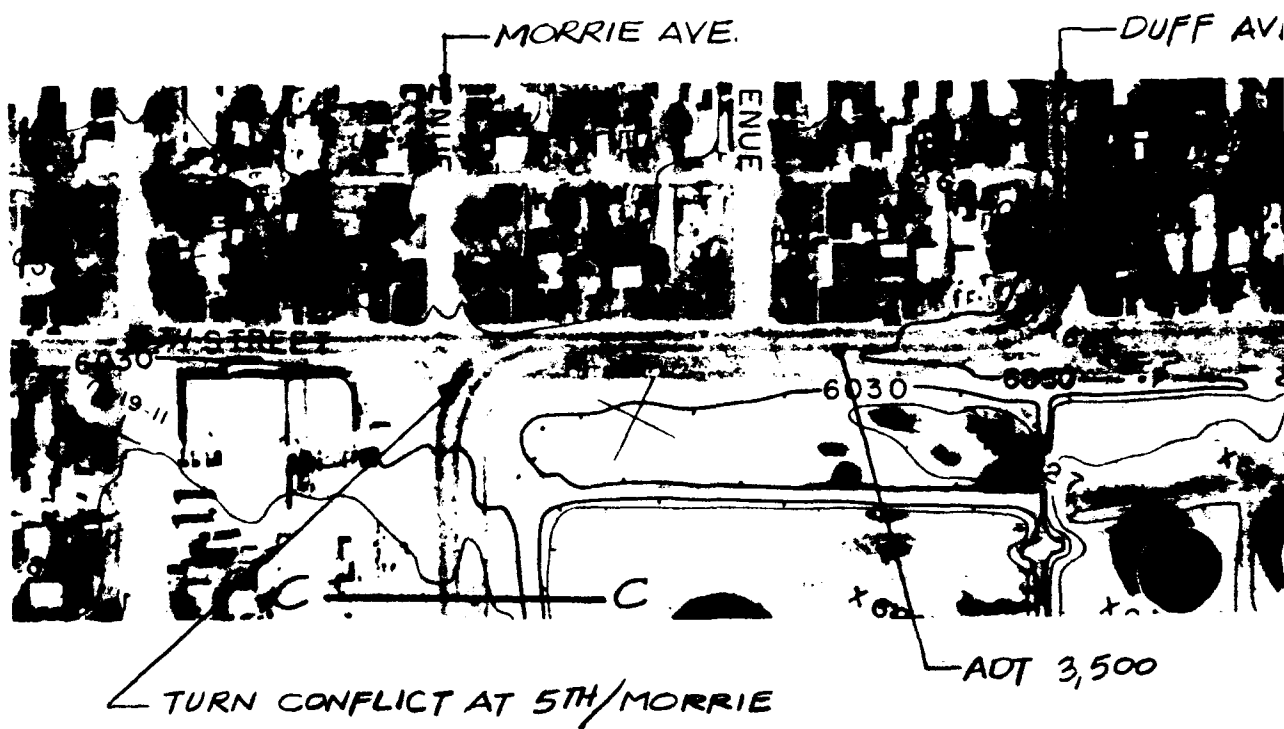
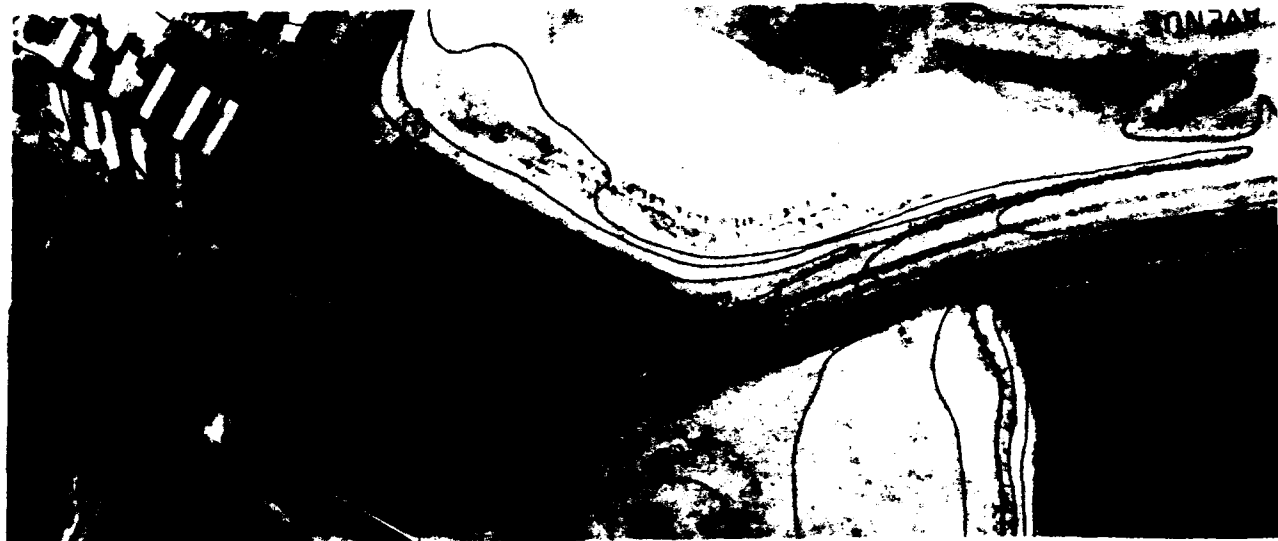
COLLEGE DRIVE TO 5TH/DUFF

1"=200'

9 A

DECEMBER, 1984

①



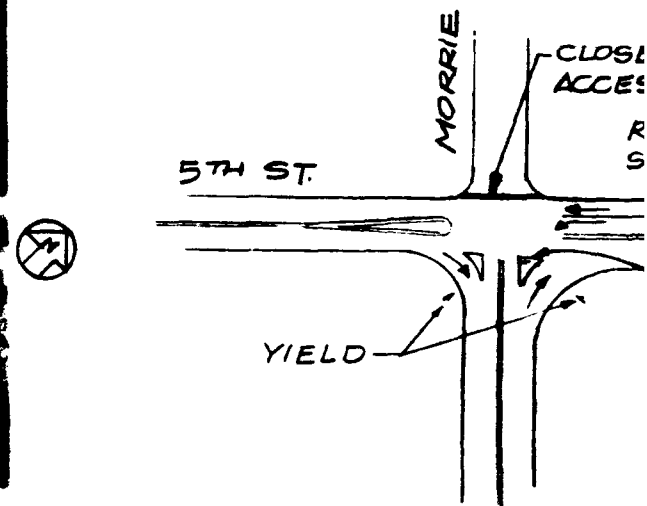
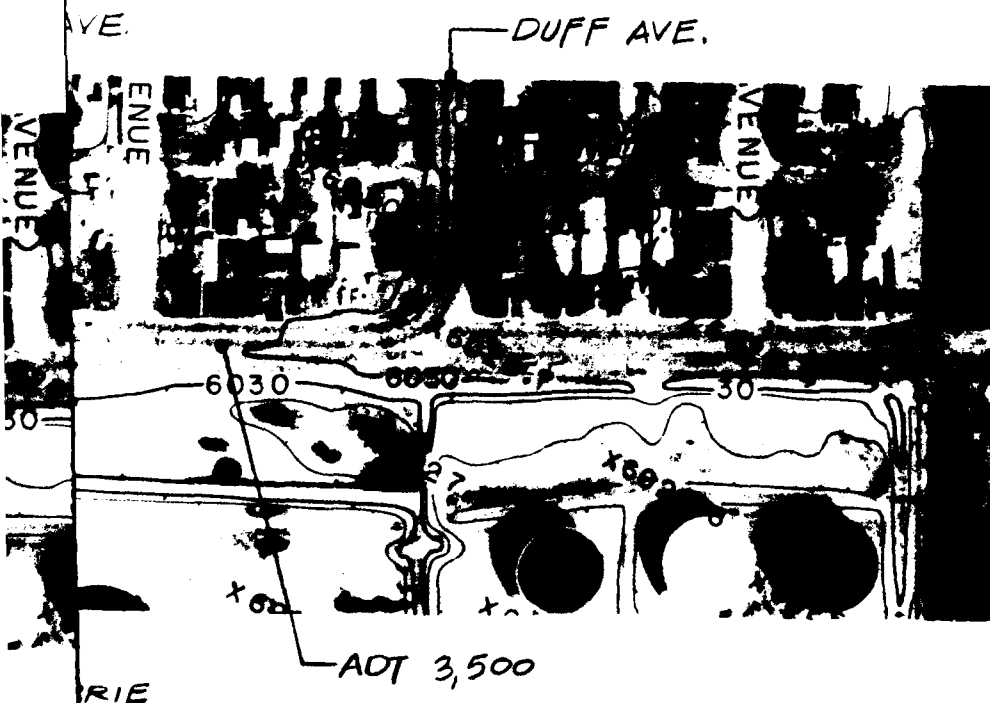
PRIMARY
MOVEMENT



N.B. LT.
CONFLICT



E.B. THRU
CONFLICT

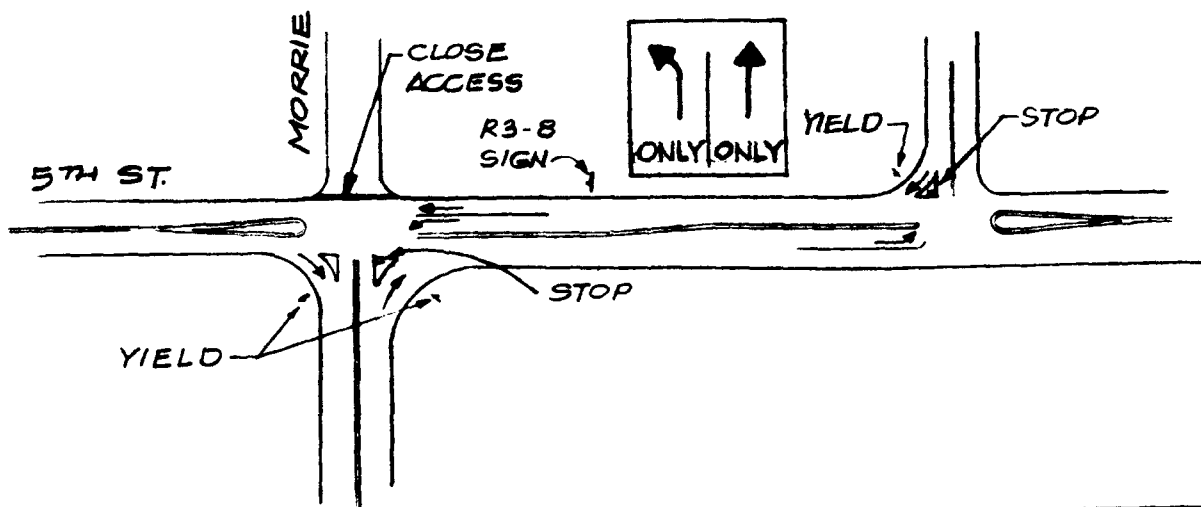
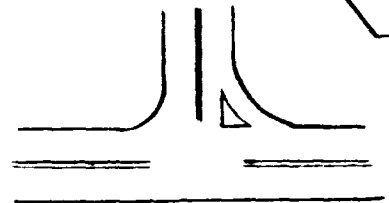


E.B. THRU
CONFLICT



ADT ← 2,900S }
N 3,000 → }

AD



CLOSE MO
PROVIDE CI
AND N. TO
PERMIT FR
& W.B. TH
RIGHT OF
TO MORRI
PROVIDE
STOP 5TH
TO E.B. L

A Professional Corporation

ARIX

Engineers Architects Planners

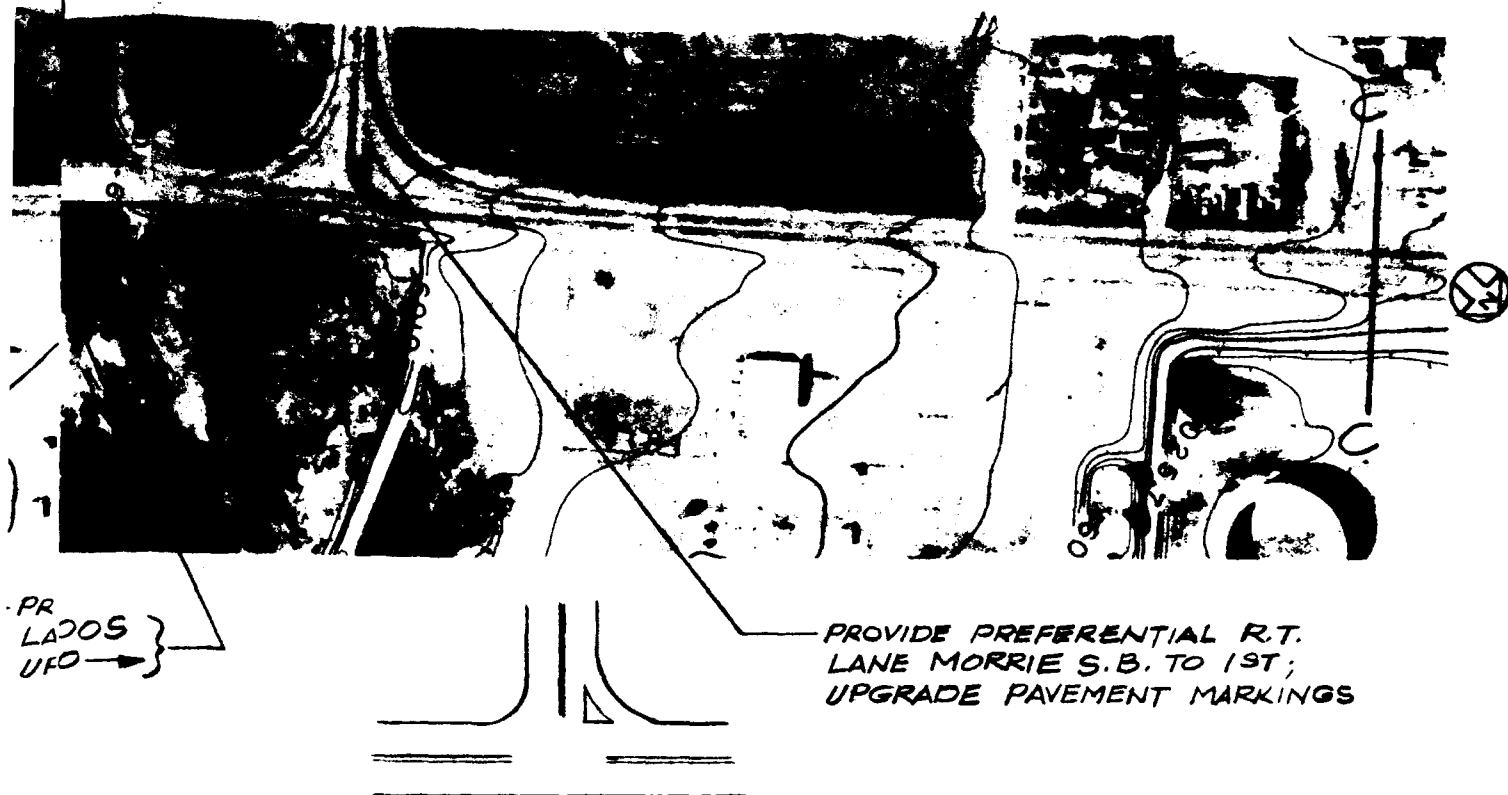
Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYEN

CORR

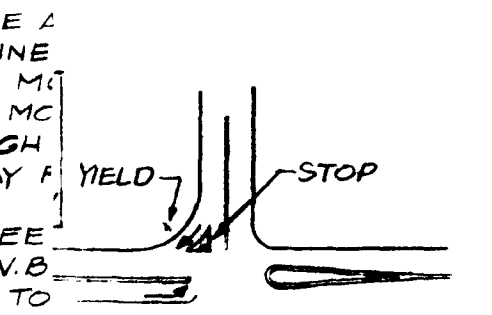
C

1" = 200'



PR
LADOS
UFO →

PROVIDE PREFERENTIAL R.T.
LANE MORRIE S.B. TO 1ST;
UPGRADE PAVEMENT MARKINGS



CLOSE MORRIE AT 5TH ST.
PROVIDE CHANNELIZED R.T. E.B. TO S.B. 5TH ST.
AND N. TO E. MORRIE WITH "YIELD" CONTROL,
PERMIT FREE MOVEMENT ON 5TH ST. FOR E.B.
& W.B. THROUGH TRAFFIC. NORMAL YIELD OF
RIGHT OF WAY FOR W.B. TO S.B. L.T. 5TH
TO MORRIE.
PROVIDE FREE R.T. DUFF TO 5TH S.B. TO W.B.,
STOP 5TH W.B. AT DUFF, AND DUFF S.B.
TO E.B. L.T. TO 5TH

A Professional Corporation ARIX Engineers Architects Planners Greeley, Colorado Grand Junction, Colorado Riverton, Wyoming Orem, Utah	CHEYENNE IMPACT CORRIDOR STUDY CORRIDOR 9 - AVENUE C/MORRIE AVENUE COLLEGE DRIVE TO 5TH/DUFF 1" = 200' 98 DECEMBER, 1994
--	---

2.10 PRAIRIE/DELL RANGE - Yellowstone to Windmill

2.10.1 Existing Conditions

The Prairie Avenue/Dell Range Boulevard corridor is a principal arterial from Yellowstone Road east to the eastern edge of the Cheyenne Urban Boundary. Within the corridor area this facility is a four lane arterial street with left turn lanes and selected right turn deceleration lanes serving major generators. Located immediately north of the airport, the Prairie/Dell Range corridor is the primary east-west arterial link serving the developing north side of Cheyenne. It provides direct access to several major commercial centers including Frontier Mall and Frontier Square, and provides easy access to north-south streets which connect to the downtown, east Cheyenne and the south side of the metropolitan area -- Yellowstone and Central to the west of the airport and Converse Avenue and Windmill Road to the east of the airport.

There is considerable vacant land along the corridor, making possible substantial future growth in commercial traffic generators. The arterial network north of the airport is quite coarse -- Powderhouse Road towards the west end of the corridor, then College Drive some two and one-half miles east, are the connecting north-south arterials, and Converse Avenue extends south to Pershing from Dell Range about midway between these two. It is important that the arterial street capacity be preserved through aggressive control of direct access.

2.10.2 Traffic Operations Problems

Generally traffic flow along the corridor is smooth and efficient. Recent traffic counts (1982) indicate average daily volumes in the 8,000 - 13,000 range, well within the capacity of a four lane arterial at level of service "C". This corridor should accommodate traffic volumes averaging 20,000 - 25,000 daily at level of service "C" -- if arterial capacity is protected. In particular, direct access to the corridor should be restricted to high type intersections at intervals no closer than one-quarter mile. Traffic signal spacing should be kept uniform to the extent possible, to permit reasonably good progression. Simply from observing the current pattern of land use, then comparing this road to sections of Yellowstone Road or Lincolnway, it is easy to anticipate that poor access control could reduce arterial capacity on Dell Range to 16,000 ADT at level of service "C-D". Driveways every few hundred feet, with full turning movements permitted, with inadequate storage lanes into parking lots, serving high turnover uses (fast foods, convenience grocery, gas stations, auto accessory shops, etc.), would effectively remove the outside two lanes from through traffic use.

A specific problem raised during the study is the apparent difficulty of exiting Mountain Road to the east. The alleged problem is that insufficient gaps are available in east-west traffic to permit a safe left turn south to east.

Converse Avenue and Windmill Road intersections with Dell Range Boulevard are both signalized, and spaced about 1,550 ft. apart. Mountain Road is about 650 ft. east of the Converse intersection; about 900 ft. west of Windmill. Traffic from the residential area north of Dell Range can exit from either Mountain Road or Windmill (Converse tees with Dell Range at the present time, although a collector extension north is shown on the classification plan). Immediately north of Dell Range is a frontage road, Sheridan, which directly links Mountain and Windmill.

Since Converse and Windmill link to Pershing to the south, traffic on Dell Range includes both east-west through traffic and a significant portion of turning traffic from the south. Thus the section of Dell Range between the two signals is occupied for most of the time -- with east-west traffic or with north-to-east and north-to-west turning traffic. Field observations during both peak (mid-day and evening) and off-peak periods confirmed the difficulty of turning left from Mountain. However, the left turn at Windmill is relatively easy, through the signal.

2.10.3 Planned/Programmed Improvements

No major improvement projects are scheduled for this corridor.

2.10.4 Alternative Improvement Actions

Mention has been made of installing a signal at Mountain Road to facilitate left turns and provide gaps for turning traffic. An isolated signal could be very disruptive to through traffic flow, so any signal should be interconnected with adjacent signals at Converse and Windmill. Good two-way progression can be obtained on Dell Range between Converse and Windmill by providing cycle lengths equal to two times the travel time. At 35 mph, cycle lengths of about 60 seconds provide good two-way progression ($35 \text{ mph} \times 1.47 = 51.33 \text{ ft./sec.}$; $1600/51.33 = 30.25$).

Inserting another signal midway between these two would require halving either the progression speed on the cycle length, neither of which is reasonable. One-eight mile signal spacing on a designated principal arterial is inconsistent.

2.10.5 Recommended Improvement Plan

The Mountain Road situation represents an excellent opportunity to set a precedent for access control of arterial streets. That is, utilize frontage roads or parallel collector streets to route traffic to designated, widely spaced, signalized intersections. Windmill Road can provide ample left turning capacity for traffic destined to the east on Dell Range, and Sheridan provides a direct link -- in the desired direction -- from Mountain. Right turning traffic can use either Windmill or Mountain equally well. The southbound approach to Windmill should be upgraded to provide a wider approach, exclusive turn lanes, and traffic responsive left turn phases to accommodate peak demand.

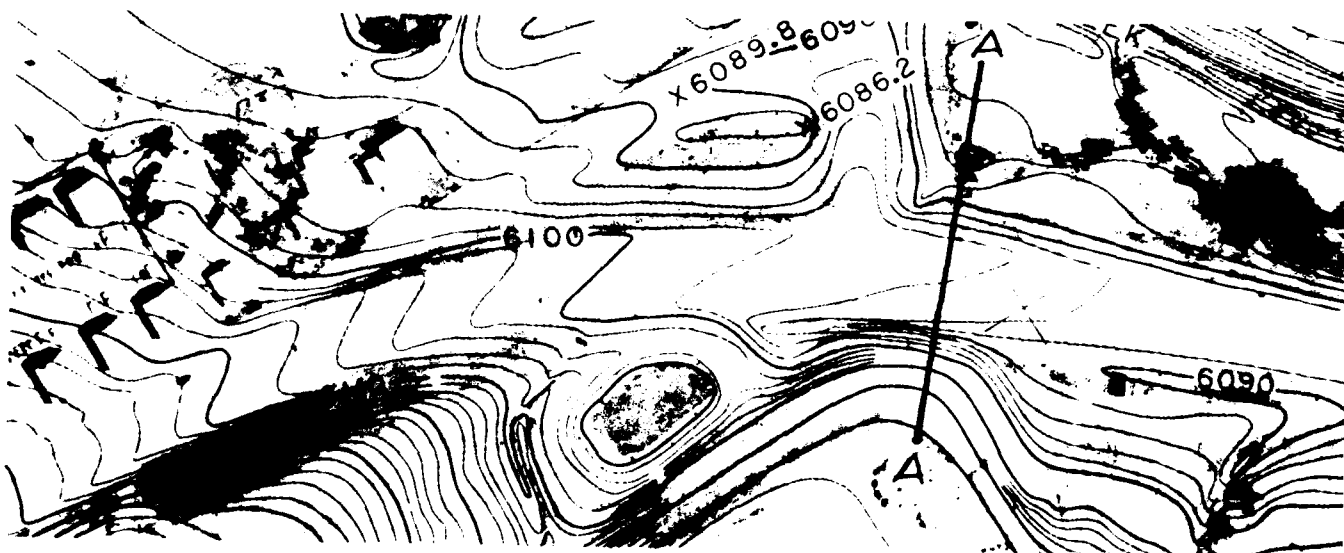
This specific recommendation is consistent with, and illustrative of, a general recommendation for the Prairie/Dell Range Corridor. Driveway and side road access directly to the arterial should be provided from parallel collector streets and/or frontage roads, with connection to the arterial limited to a few high-type channelized, signalized intersections. A specific access control plan should be prepared for this corridor so that developers and property owners are aware of the limitations. Further, construction of necessary collectors and/or frontage roads should be evaluated to determine the feasibility of private funding, as part of the plan approved process.

The extension of Converse north of Dell Range as a collector, as indicated on the functional classification plan, would also provide access from the areas now using Mountain. This improvement should be considered as part of the forthcoming transportation plan update project.

1



ADT 10,300



AD



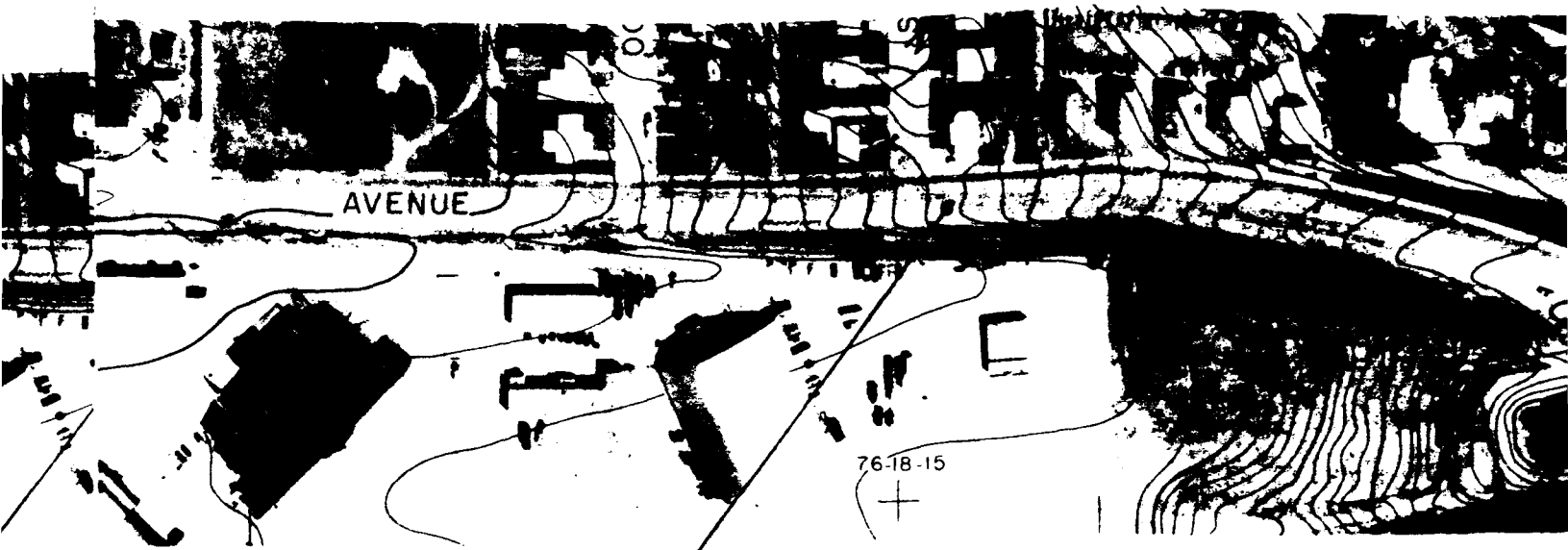
ADT 10,300

RECENTLY CONSTRUCTED ARTERIAL STREET
TWO LANES EACH DIRECTION, CENTER
TURNING LANE WITH SEPARATE TURN
LANES AT INTERSECTIONS

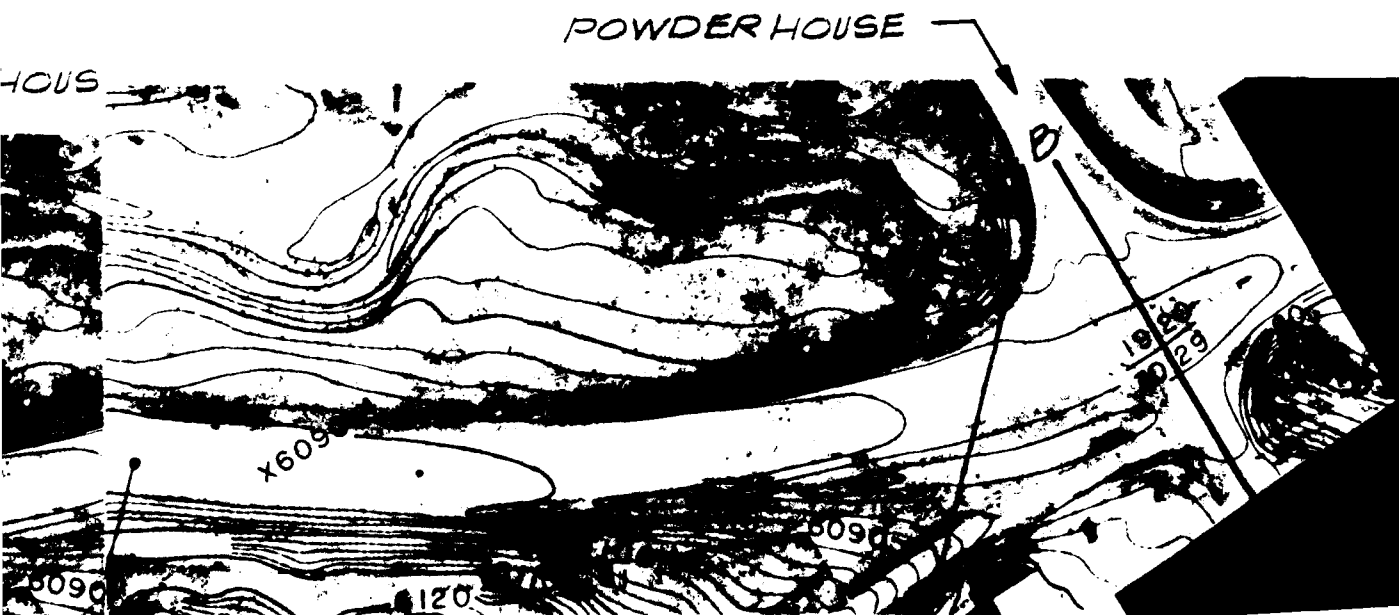


ADT 8,100

DEVELOP W.B. RIGHT
ACCELERATION TAPER
POWDERHOUSE S.B. TO
DELL RANGE W.B. —



INSTRUCTED ARTERIAL STREET
 EACH DIRECTION, CENTER
 LINE WITH SEPARATE TURN
 INTERSECTIONS



DEVELOP W.B. RIGHT TURN
 ACCELERATION TAPER FROM
 POWDERHOUSE S.B. TO
 DELL RANGE W.B.

A Professional Corporation

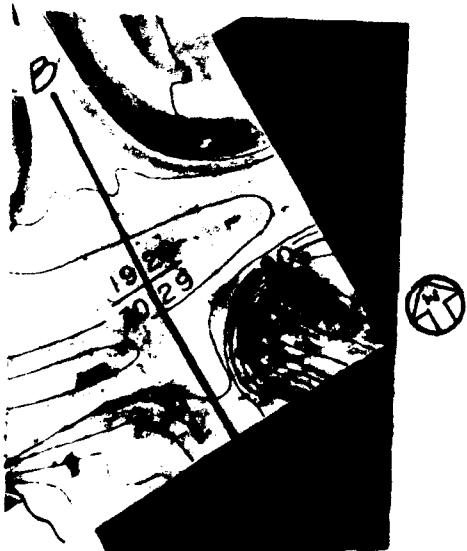
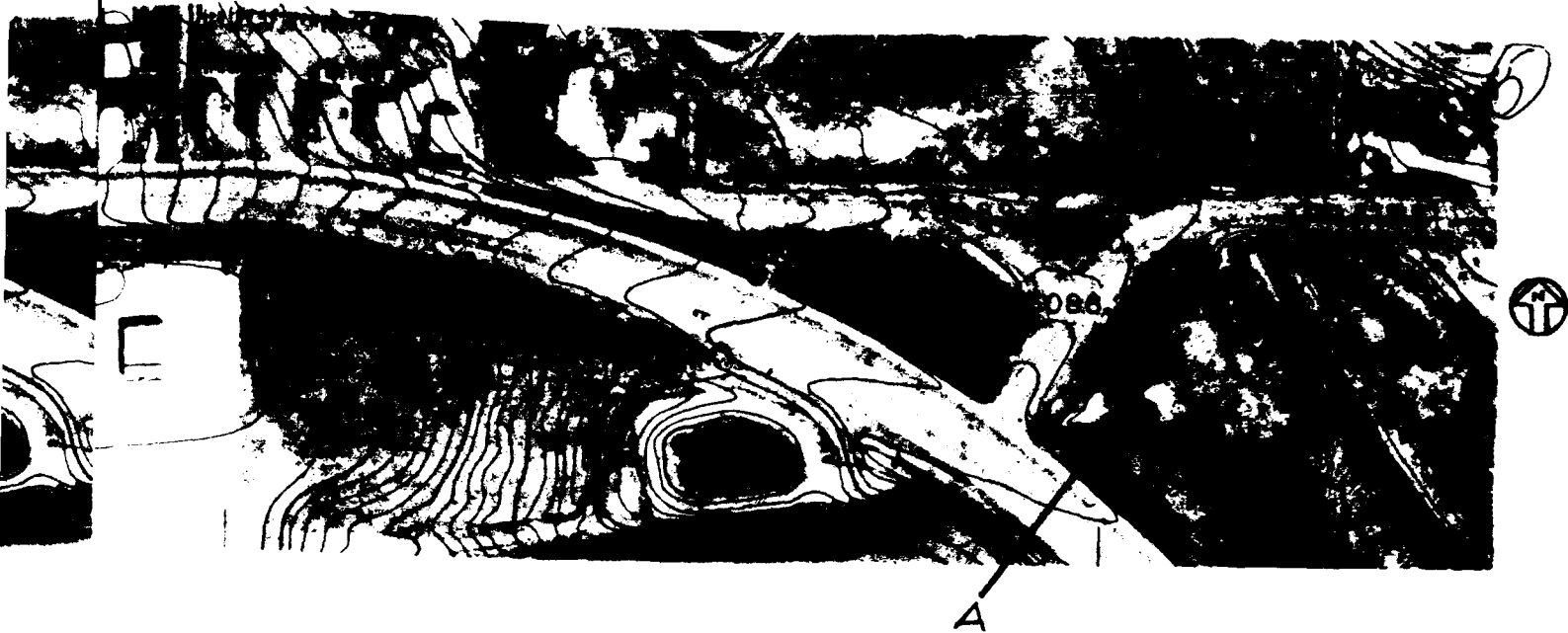
ARIX

Engineers Architects Planners

Greeley, Colorado
 Grand Junction, Colorado
 Riverton, Wyoming
 Orem, Utah

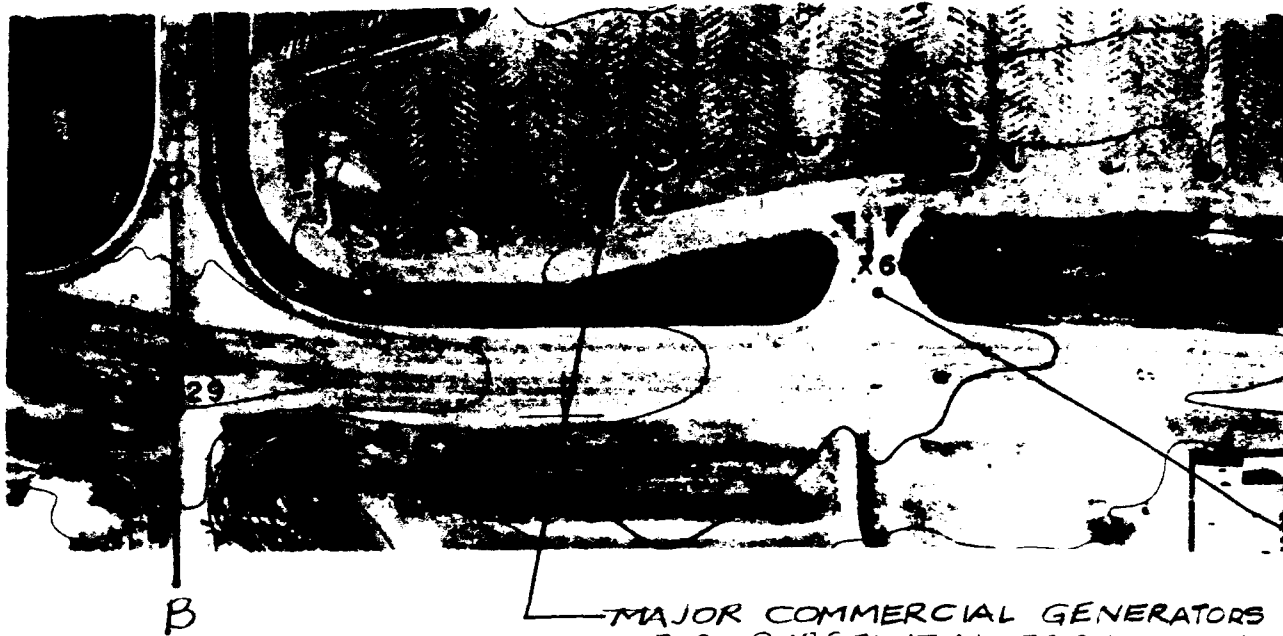
CHE

1" = 20'

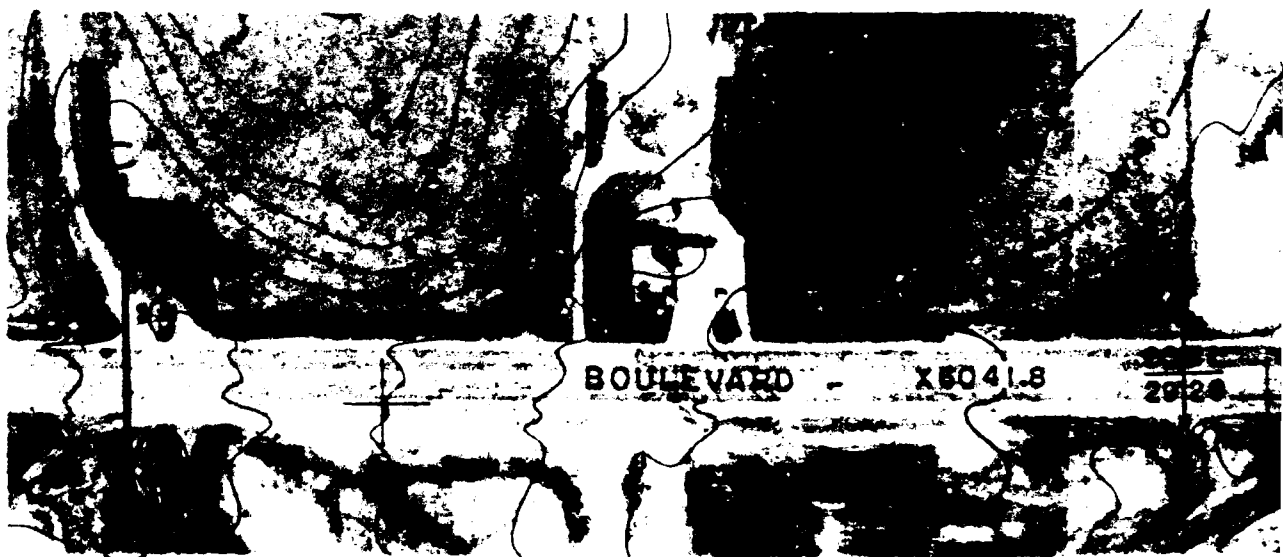


CHEYENNE
CORRIDOR
YELLOWSTONE

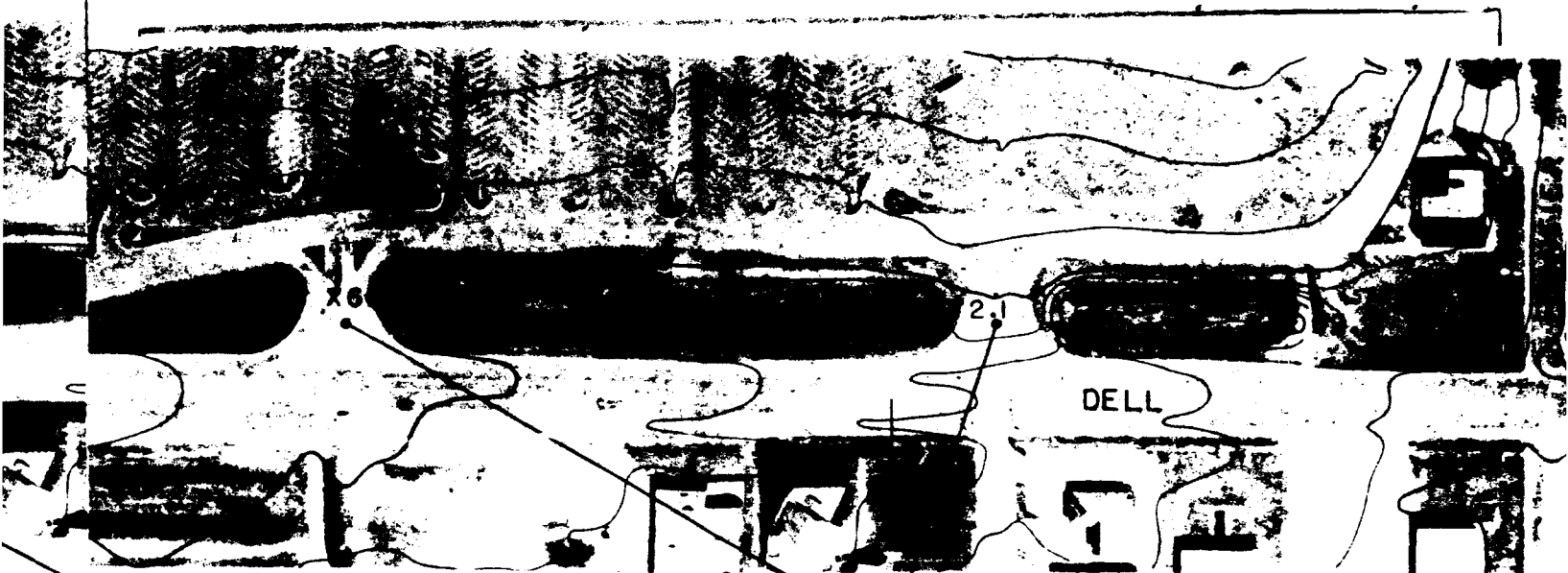
A Professional Corporation ARIX Engineers Architects Planners Gregory, Colorado Grand Junction, Colorado Riverton, Wyoming Orem, Utah	CHEYENNE IMPACT CORRIDOR STUDY		
	CORRIDOR 10 - PRAIRIE/DELL RANGE		
	YELLOWSTONE TO WINDMILL		
	1" = 200'	10 A	DECEMBER, 1984



MAJOR COMMERCIAL GENERATORS
SIDES. SUBSTANTIAL ROOM FOR GROW
MAINTENANCE OF ACCESS CONTROL
ESSENTIAL TO PRESERVE CAPACITY



STRONG ACCESS CONTROL POLICY NEEDED
TO PRESERVE CAPACITY AS VACANT LAND
DEVELOPS WITH MAJOR TRAFFIC GENERATORS



MAJOR COMMERCIAL GENERATORS BOTH SIDES. SUBSTANTIAL ROOM FOR GROWTH. MAINTENANCE OF ACCESS CONTROL IS ESSENTIAL TO PRESERVE CAPACITY

UPDATE FRONTIER MALL ACCESS POINTS TO INCREASE EXIT & ENTRY STORAGE CAPACITY. CONSIDER CONSOLIDATION OF DELL RANGE AC TO ONE MID-BLOCK SIGNALIZED LANE WITH ACCELERATION, DECELERATION & LEFT TURN STORAGE LANES

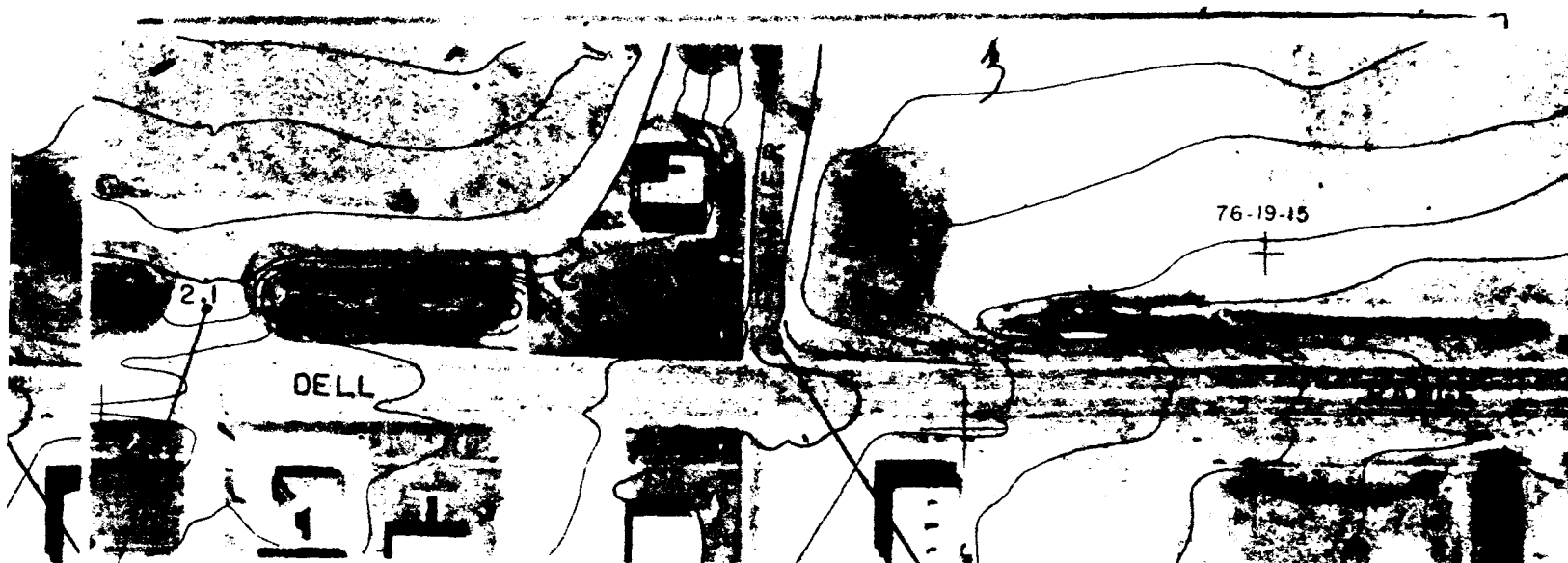


CONTROL POLICY NEEDED CITY AS VACANT LAND FOR TRAFFIC GENERATORS

ADT 12,800

CONVERSE (SIGNALIZED)

EXTEND CONVERSE TO FUNCTIONAL CLASSIFICATION AS COLLECTOR TO S RESIDENTIAL ACCESS MOUNTAIN RD.



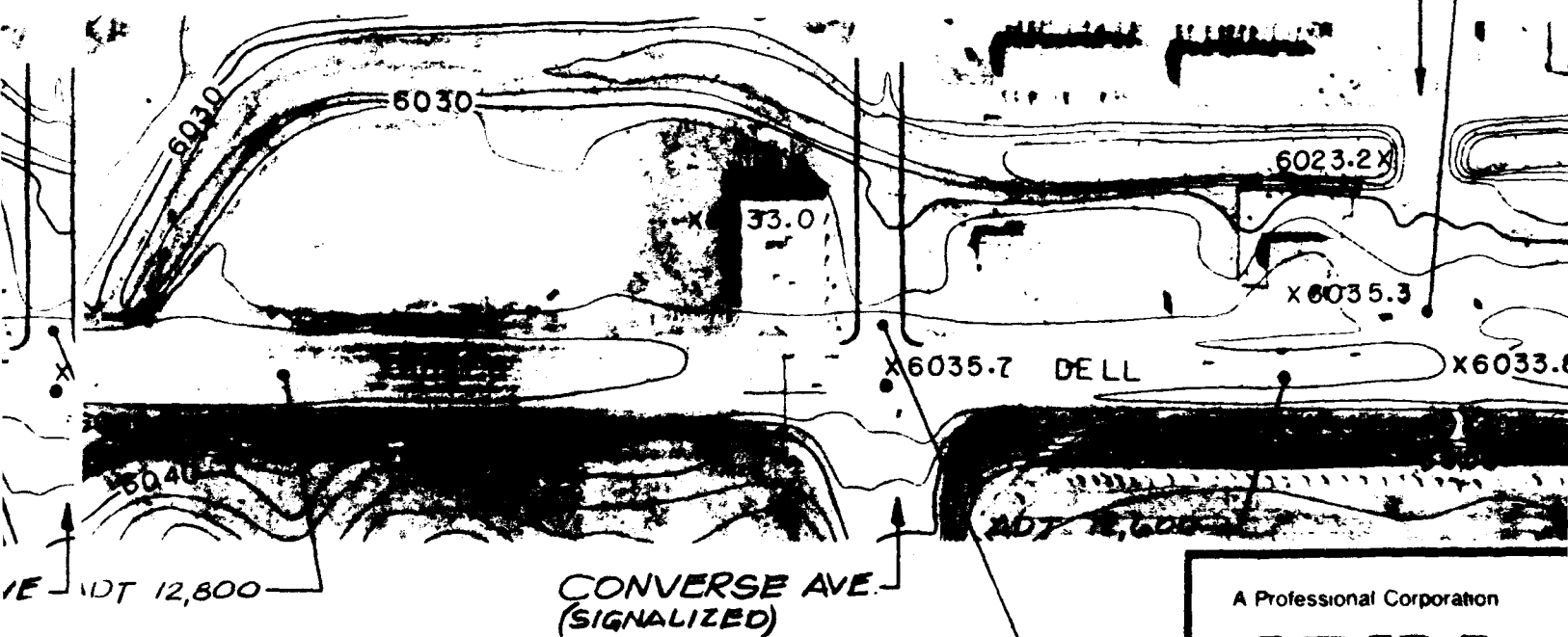
SS
TION

- UPDATE FRONTIER MALL ACCESS POINTS TO INCREASE EXIT & ENTRY STORAGE CAPACITY. CONSIDER CONSOLIDATION OF DELL RANGE ACCESS TO ONE MID-BLOCK SIGNALIZED LOCATION WITH ACCELERATION, DECELERATION & LEFT TURN STORAGE LANES

- PROVIDE ACCELERATION AND DECELERATION LANES ON DELL RANGE AT FRONTIER INTERSECTION

RIGHT TURN EXIT PRIORITY

MOUNTAIN RD.



TH F
TION
E
REL

EXTEND CONVERSE NORTH PER
FUNCTIONAL CLASSIFICATION PLAN
AS COLLECTOR TO SERVE
RESIDENTIAL ACCESS & RELIEVE
MOUNTAIN RD. _____

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

76-19-15

ACCELERATION AND
RATION LANES ON
RANGE AT FRONTIER
SECTION

LEFT TURN EXIT PRIORITY
POTENTIAL FUTURE UPGRADING OF
APPROACH WITH EXCLUSIVE TURN LANES

EXIT PRIORITY

RD.

WINDMILL RD.
(SIGNALIZED)

ADT 4000

SHERIDAN

6017.7

6020

6023.2

DRY 6020

6030

X 6035.3

X 6033.8

RANGE

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 10 - PRAIRIE/DELL RANGE

YELLOWSTONE TO WINDMILL

1" = 200'

10 B

DECEMBER, 1984

2.11 COLLEGE DRIVE - Parsley Boulevard to Avenue C

2.11.1 Existing Conditions

College Drive from Parsley Boulevard to U.S. 85 is classified as a minor arterial and is approximately 1.5 miles long. Adjacent land use is primarily open space and residential with some commercial areas which contribute to the traffic on College Drive. Speed limit is 50 mph from Parsley Boulevard to just east of York Avenue where it drops to 40 mph to U.S. 85. The street is two lane, two way and on-street parking is not provided at any location. To the east, there is very little access control. The street is approximately 35 ft. wide in an 80 ft. right-of-way. There are two traffic signals: a pedestrian actuated school crossing signal at Rossman School, and a two phase traffic actuated signal at U.S. 85. Reported accidents at major locations are:

- * Parsley Boulevard - 1981 - 2, 1982 - 4, 1983 - 2)
- * U.S. 85 - (1981 - 7, 1982 - 11, 1983 - 2)

College Drive between U.S. 85 and Avenue C is also classified as a minor arterial and is approximately .55 mile long. Adjacent land use is primarily low density residential with some commercial land use near U.S. 85 which contributes to traffic volume on College Drive. Speed limit is 40 mph. The street is two lane, two way and on-street parking is not provided at any location. The street is approximately 30ft. wide in an 80 ft. right-of-way. There are no traffic signals on this section of College Drive. Reported accidents at major locations are:

- * Avenue C - (1981 - 4, 1982 - 3, 1983 - 5)

2.11.2 Traffic Operations Problems

At the rural tee intersection of Parsley Boulevard, there is no street lighting, and the horizontal and vertical alignment together with the 50 MPH speed limit on College Drive creates a potentially unsafe condition. There are no separate left turn lanes and it was noted during field observations that there are skid marks on College Drive eastbound where vehicles turn left onto Parsley Boulevard. These are likely caused by vehicles braking suddenly to avoid left turning vehicles.

Between the Orchard Valley main entrance and U.S. 85, there is very little access control with numerous driveways and minor streets intersecting College Drive. These foster confusing and conflicting movements on both sides of College Drive. It was noted during field observations that vehicles travelled short distances in the wrong direction on the edges of College Drive. Left turning vehicles on College Drive do not have separate turn lanes and so delay through traffic.

At the intersection of College Drive and U.S. 85, there are no separate left turn lanes, causing left turners block through traffic while waiting for a gap in opposing traffic. This reduces capacity

and increases accident exposure. In addition, the two valley pans on College Drive cause traffic to slow down further reducing capacity. There are no designated walks along College Drive for pedestrian traffic.

At the intersection of College Drive and Avenue C there are no separate left turn lanes. This is especially hazardous with the 40 mph speed limit. Left turners stop in the through lane and the eastbound left turn movement is fairly heavy. Vehicles turning left have to wait for gaps in opposing traffic from Laramie County Community College.

2.11.3 Planned/Programmed Improvements

There are no projects currently planned in this corridor.

2.11.4 Alternative Improvement Actions

The Wyoming Highway Department monitors critical locations, such as the Rossman School crossing, on a periodic basis. No action is indicated at this time, although the monitoring process should be continued. WHD also evaluated the need for illumination at the Avenue C intersection and concluded that it was not sufficiently warranted to merit installation at State expense. The option was left open to install lighting at local agency cost.

Depending upon the pace of development in the future, College Drive traffic will reach a threshold of about 7,000 - 8,000 ADT at which point two lanes through capacity will be inadequate. The extensive incidence of turning traffic degrades capacity. A relatively low cost option to improve the situation would be to widen the road to a three lane section with two through lanes and a center turn lane. This separates opposing traffic, provides between-intersection storage capacity for turning vehicles, facilitates through traffic flow, and avoids the higher cost of full four lane widening.

2.11.5 Recommended Improvement Plan

Stop sign controlled locations in rural areas, where posted speed limits are 40 mph or greater should be evaluated to determine if advance warning W3-1a STOP AHEAD signs are warranted and would likely be effective.

Since no major widening on College Drive is programmed for the near future, strong consideration should be given to localized intersection approach widening at selected sites. Even if minimum geometric standards of storage length, approach tapers and shoulder widths are met, this economical spot improvement can reduce accident exposure and increase level of service. Candidate locations are Parsley Boulevard, Walterscheid Boulevard and Avenue C.

The signalized intersection with U.S. 85 experiences relatively large left turn volumes, especially in the east-west direction. Since the intersection is signalized, and College Drive approaches have only one lane, overall intersection is severely diminished. As

noted in the volume count schematic (Figure 11.B), turning movement volumes are comparable to through movements in the east-west direction; left turn volume makes up 37 percent of east-west approach traffic. Separate left turn lanes with at least two vehicle lengths (50 ft.) of storage should be provided here. Such improvements would improve level of service and should measurably reduce the accident experience at this location.

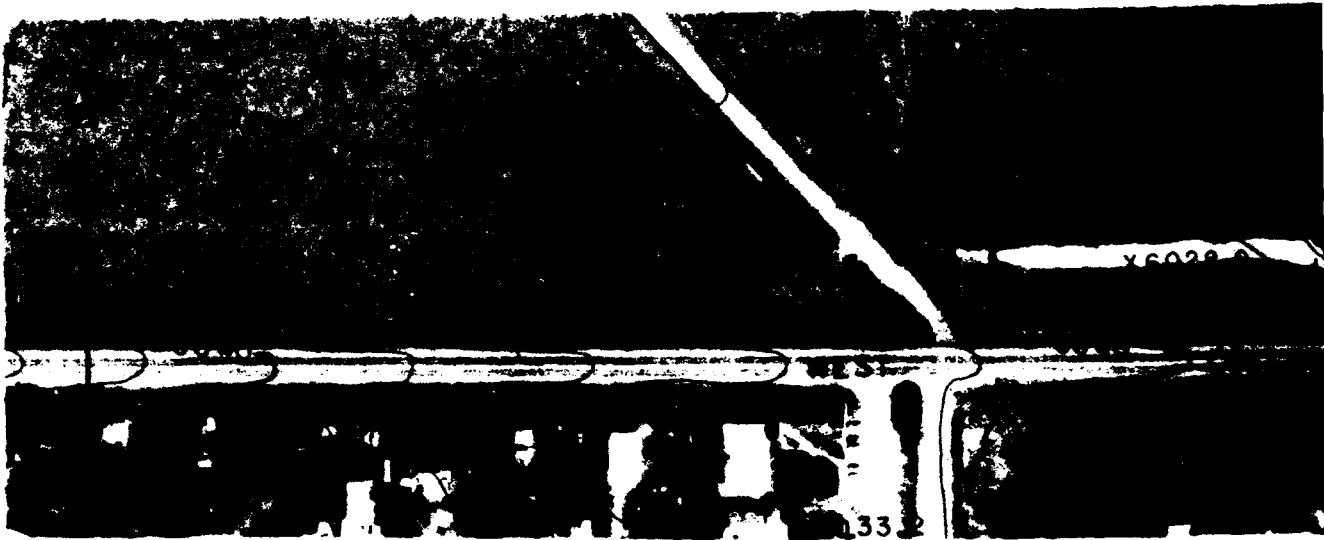
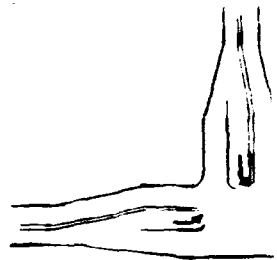
①



ADT 3200—

INTERSECTION NOT
ILLUMINATED, ONLY SINGLE
LANE EACH DIRECTION.
APPROACH SPEEDS HIGH
FROM EAST AND WEST —

— PARSELY BOULEVAD



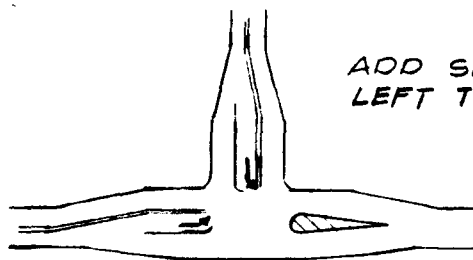
ROSSMAN SCH

ADD SEPARATE
LEFT TURN LANE

IN NOT
ONLY SINGLE
DIRECTION.
SPEEDS HIGH
AL AND WEST
LE

PARSLEY BOULEVARD

ADT 4000



ADD SEPARATE
LEFT TURN LANES





DT 4000

PARATE
RN LANES

MAINTAIN ACCESS CONTROL ON
NORTH SIDE; IMPROVE ACCESS
CONTROL ON SOUTH SIDE



60



MAINTAIN ACCESS CONTROL ON
NORTH SIDE; IMPROVE ACCESS
CONTROL ON SOUTH SIDE



A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

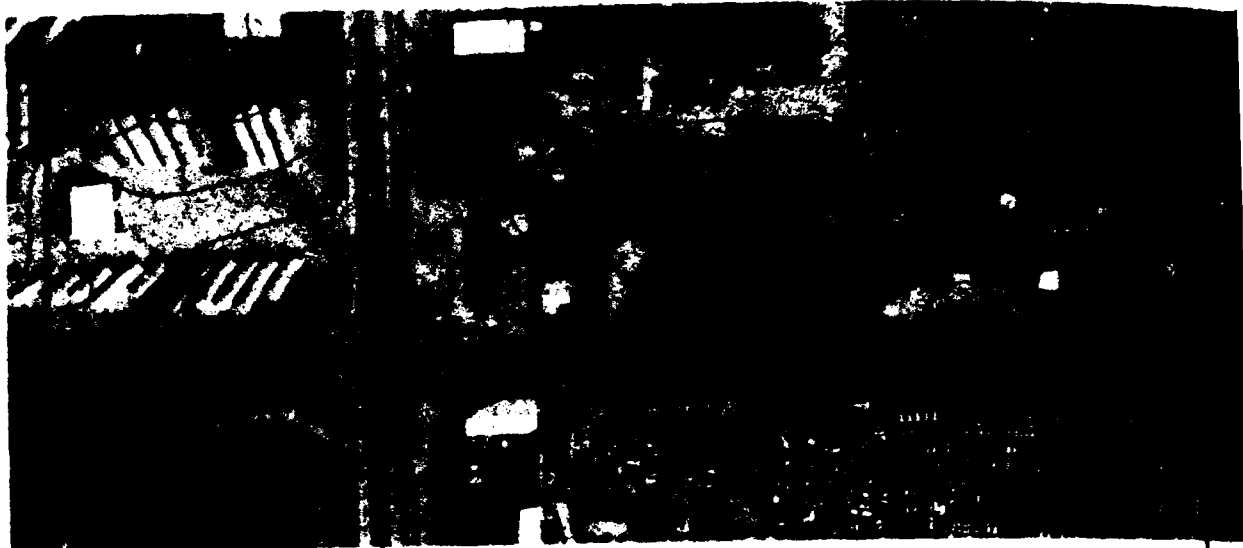
CORRIDOR II - COLLEGE DRIVE

PARSLEY BOULEVARD TO AVENUE C

1" = 200'

II A

DECEMBER, 1984

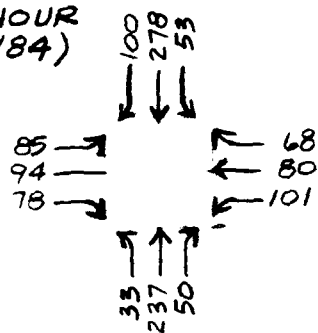


ADT 6100

ADT 5800

U.S. 85 - SOUTH GREELEY HWY.

P.M. PEAK HOUR
VOLUMES (12/84)

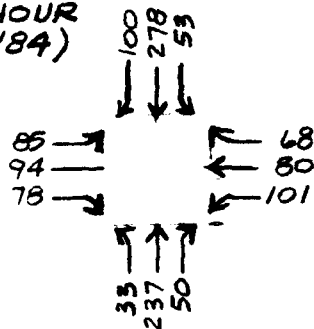


INSTALL LEFT TURN
LANES ON EAST & WEST
APPROACHES

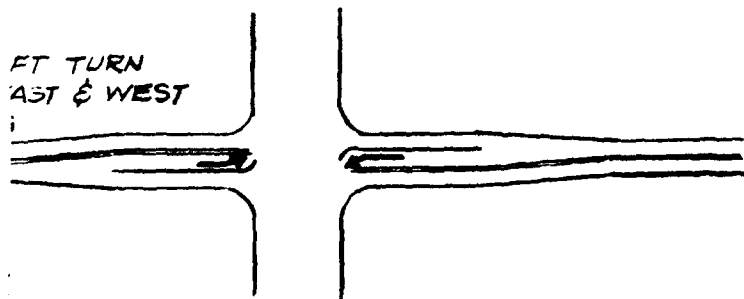
ADT 3800

35- SOUTH GREELEY HWY.

PEAK HOUR
MES (12/84)

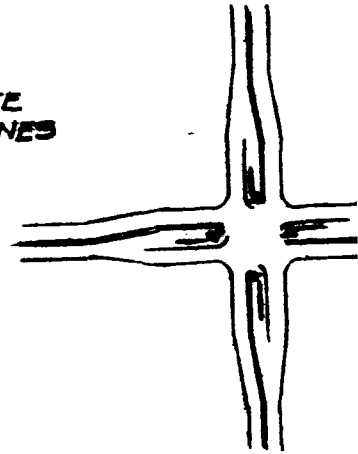


FT TURN
AST & WEST



AVENUE C

ADD SEPARATE
LEFT TURN LANES



A Professional Corporation

ARIX

Engineers Architects Planners

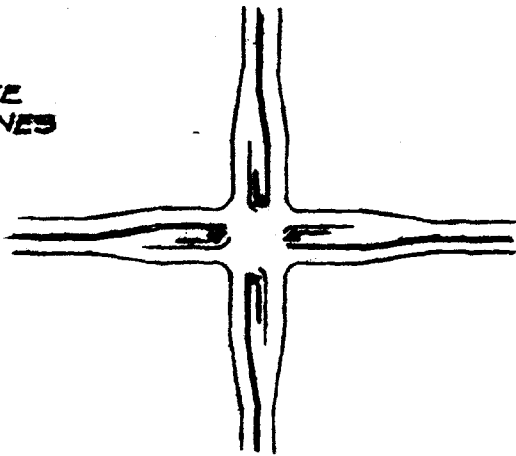
Denver, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Salt Lake City, Utah

AVENUE C

← 2300 W
E 2000 →

E 2

PARATE
N LANES



A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 11 - COLLEGE DRIVE

PARSLEY BOULEVARD TO AVENUE C

1" = 200'

118

DECEMBER, 1984

2.12 CONVERSE - Dell Range to Lincolnway

2.12.1 Existing Conditions

Converse Avenue from Dell Range Boulevard to Pershing Boulevard is classified as a minor arterial. This section of road is approximately 1.2 miles long. Adjacent land use is vacant land belonging to either the Recreation Department, Airport or VA Hospital. The west side of the south 0.4 mile near Pershing Boulevard is residential area. The street is two lane, two way with a speed limit of 30 mph. On-street parking is not provided. The street is 35 ft. wide in an 80 ft. right-of-way. The north approach has three lanes at the tee intersection with Dell Range: northbound left and right turn lanes, and a southbound lane. The Pershing Boulevard approach has two through lanes and one left turn lane southbound, and two through lanes northbound. There are two sharp turns posted 20 mph in this section. There are two traffic signals: a three phase actuated signal at Dell Range Boulevard and a two phase pre-time signal at Pershing Boulevard. There is a heavy west to south left turn movement from Dell Range to Converse Avenue and a "protected/permissive" left turn phasing scheme is provided. Reported accidents at major locations are:

- * Dell Range Boulevard - (1981 - 5; 1982 - 9; 1983 - 8)
- * Pershing Boulevard - (1981 - 18; 1982 - 23; 1983 - 7)

Between 1982 and 1983 the Pershing Boulevard/Converse Avenue intersection was re-constructed, resulting in significant reduction in accidents.

Converse Avenue between Pershing Boulevard and Lincolnway is classified as a minor arterial. This section is 0.5 mile long. Adjacent land use is primarily residential. However, on the north end, there is a neighborhood shopping center that contributes substantially to traffic on Converse Avenue. On the south end there is also mixed commercial land use on Lincolnway. The speed limit is 30 mph and on-street parking is permitted south of 19th Street on both sides of Converse Avenue. The street is 60 ft. wide in an 80 ft. right-of-way. There are two traffic lanes in each direction south of 19th Street. Between 19th Street and Pershing Boulevard there is a center left turn lane. At Lincolnway the inside southbound lane is for left turns and the outside lane is for through and right turning traffic. There is a pedestrian crossing at the intersection of East 16th Street with advance and crossing location warning signs for both approaches of Converse Avenue. There are two traffic signals: a two phase pre-timed signal at 19th Street, and a two phase pre-timed signal at Lincolnway. Reported accidents at major locations are:

- * 19th Street - (1981 - 12; 1982 - 2 or less; 1983 - 10)
- * Lincolnway - (1981 - 12; 1982 - 2 or less; 1983 - 10)

2.12.2 Traffic Operations Problems

On the narrow two lane, two way section of Converse between Dell Range Boulevard and Pershing Boulevard, there are two severe turns both of which restrict through traffic capacity. This entire section is not illuminated and there are no edge lines or delineators for most of this section.

During the summer there are significant numbers of pedestrians and bicyclists who use this road. However, there are no bikeways or sidewalks to serve pedestrians and bicyclists. The pedestrians and bicyclists are accessing recreational facilities where a significant amount of vehicular traffic is also generated. However there are no special turn lanes on Converse Avenue for either right turns or left turns. At peak periods, where there are heavy turning movements, through traffic is delayed because of left turns waiting for opposing traffic to clear.

At the intersection of Converse Avenue/Pershing Boulevard/19th Street the left turning movements northbound causes some confusion because two left turns are close to each other. There are no special signs or pavement markings to distinguish and separate the left turns to 19th Street and to Pershing.

At the intersection of Lincolnway and Converse Avenue, there are some operational problems with lanes in the north and south direction.

2.12.3 Planned/Programmed Improvements

A project had been considered earlier to reconstruct Converse Avenue between Dell Range Boulevard and Pershing Boulevard. The initial proposal was not feasible to implement, and the project is being redesigned. As the first north-south arterial east of the airport, Converse Avenue is an important link between north Cheyenne and the east side of Central Cheyenne.

2.12.4 Alternative Improvement Actions

Problems on Converse are focused in two locations -- the narrow roadway between Dell Range and Pershing, and the Pershing/19th Street intersection. The narrow section is clearly in need of improvement to a four lane section : widening, flattening of curves, and improvement of recreational access intersections. A determination should be quickly made as to whether the road realignment project can be implemented in the near future. If so, it should be pursued. If it appears that the project will be delayed beyond one or two years, then interim actions can be considered.

- * On the two 90 degree curves the roadway section could be widened to further separate opposing traffic, with a wide (6 - 8 ft.) painted center median of separate double yellow lines with cross-hatching (see Figure 3-13.a, Manual on Uniform Traffic Control Devices for example).

- At busy intersections such as park or stable access, the roadway could be widened and marked to develop a short (30 ft. storage, plus taper) left turn pocket.

At the 19th/Pershing intersection three options are possible to deal with the northbound left turn problem.

- Leave things as they are.
- Prohibit left turns at 19th Street, since reasonable alternate routes are available.
- Attempt to segregate the left turns to reduce the volume of "through-to-left" traffic from the 19th Street turn lane to the Pershing turn lane.

2.12.5 Recommended Improvement Plan

Reconstruction and widening of Converse to four lanes between Dell Range and Pershing, including flattening of the two curves, is recommended. This project should include in its design separate pedestrian and bicycle facilities to enhance the attractiveness of the park areas, softball and baseball fields and the equestrian center. There are already bikeway facilities in the surrounding area: an excellent bike path along Dell Range, a marked bike route along Pershing, and a bikeway along Windmill.

Eventually it may be necessary to restrict turns at 19th Street. For the near term, however, it is recommended that lane use control signs be installed overhead to better guide traffic.

- At 19th Street on the northbound approach, install a modified R3-5 with the words "19th Street" added above the left turn arrow. This should be placed over the left turn lane. A modified R3-5 with the words "Pershing Boulevard" over a through arrow should be placed over the inside through lane. A standard R3-5 left only sign should be placed over the left turn lane at Pershing.
- The approach could be further improved by eliminating the few parking spaces on the east side. This would permit shifting the northbound lanes east a few feet, so the left turn lane at 19th Street faced a bulb, and the inside through width left, to turn left, or half a lane width right, to continue through.

At Converse and Lincolnway overhead lane use control signs should be installed on both north and south approaches to provide advance warning of intersection channelization.



ADT 7,800

DELL RANGE BLVD.

NARROW TWO LANE, TW
SHOULDERS; POSTED FOR
SPEEDS ARE HIGHER



SHARP TURN

WAY
M.P.

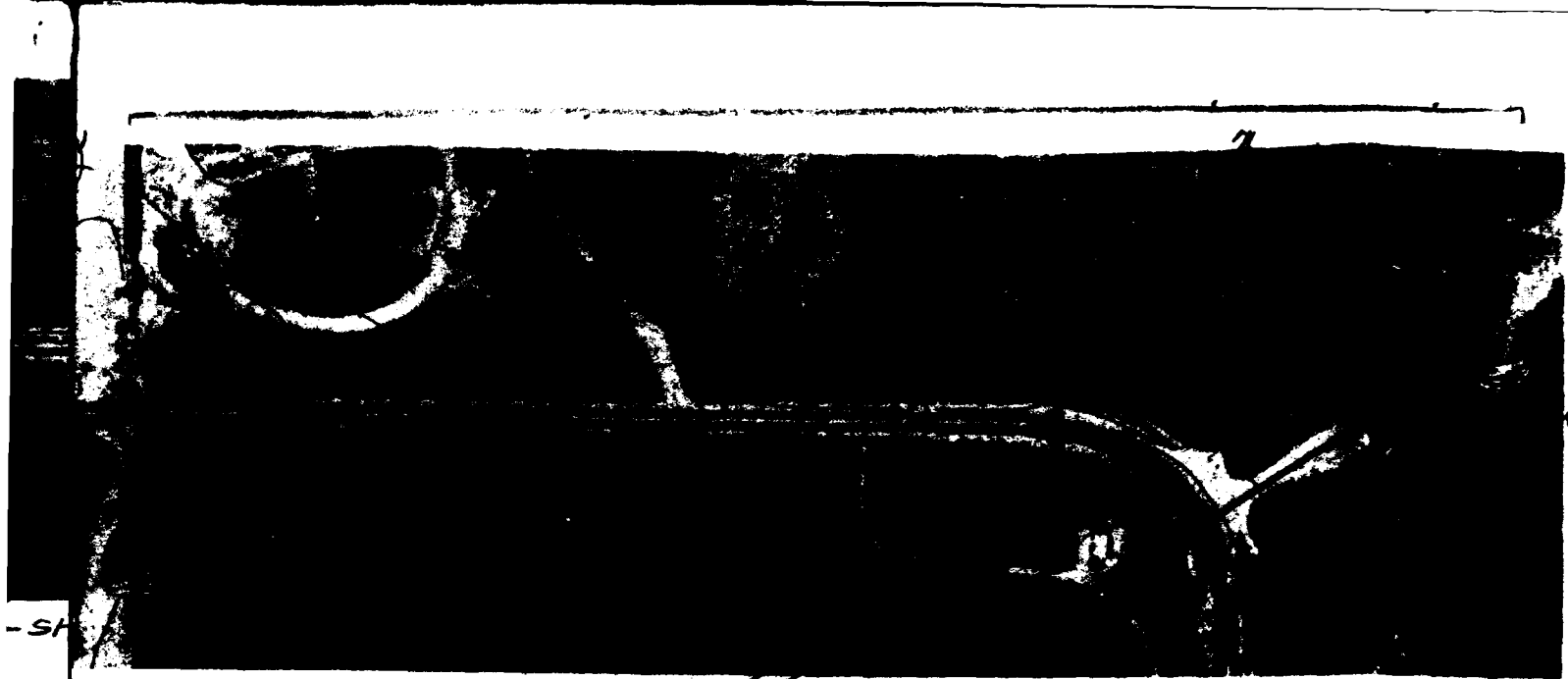
ADT 7,800 —

IGE BLVD.

NARROW TWO LANE, TWO WAY ROAD WITH POOR
SHOULDERS; POSTED FOR 30 M.P.H. BUT OPERATING
SPEEDS ARE HIGHER



RP TURN —



-SH

SHARP TURN

TWO WAY ROAD WITH POOR
FOR 30 M.P.H. BUT OPERATING
R



A Professional Corporation

ARIX

Engineers Architects P

Denver, Colorado
Gyrford Junction, Colorado
Newton, Wyoming
Orem, Utah



(4)

A Professional Corporation

ARIX

Engineers Architects Planners

Grasby, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Oram, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 12 - CONVERSE AVENUE

DELL RANGE TO LINCOLNWAY

1" = 200'

12 A

DECEMBER, 1994

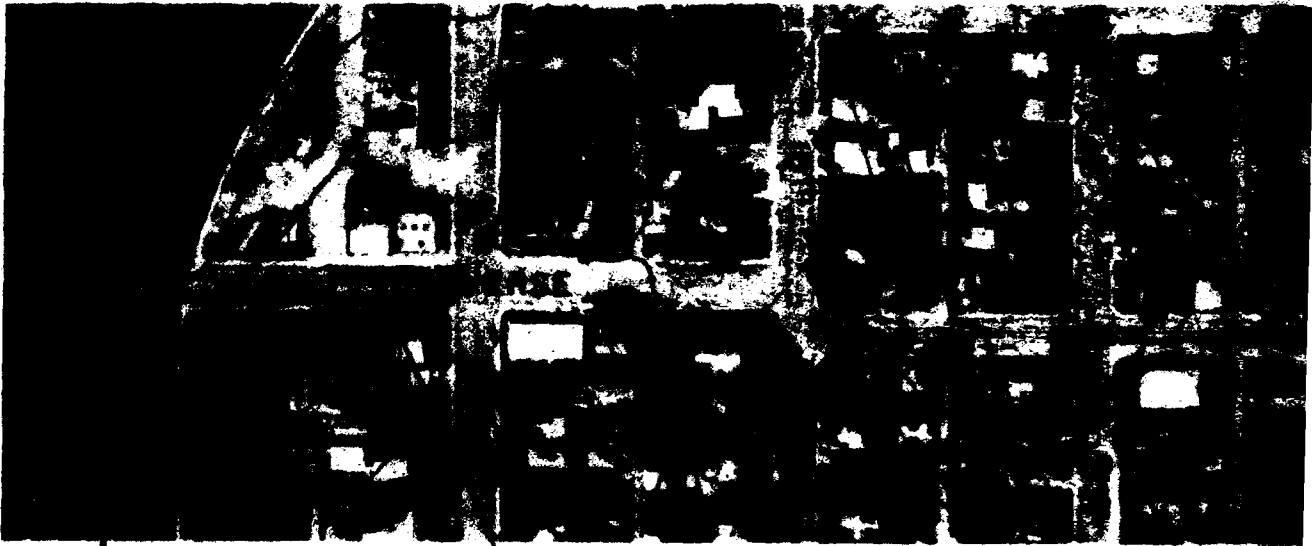
①



ADT ← 5100S
N 3800 →

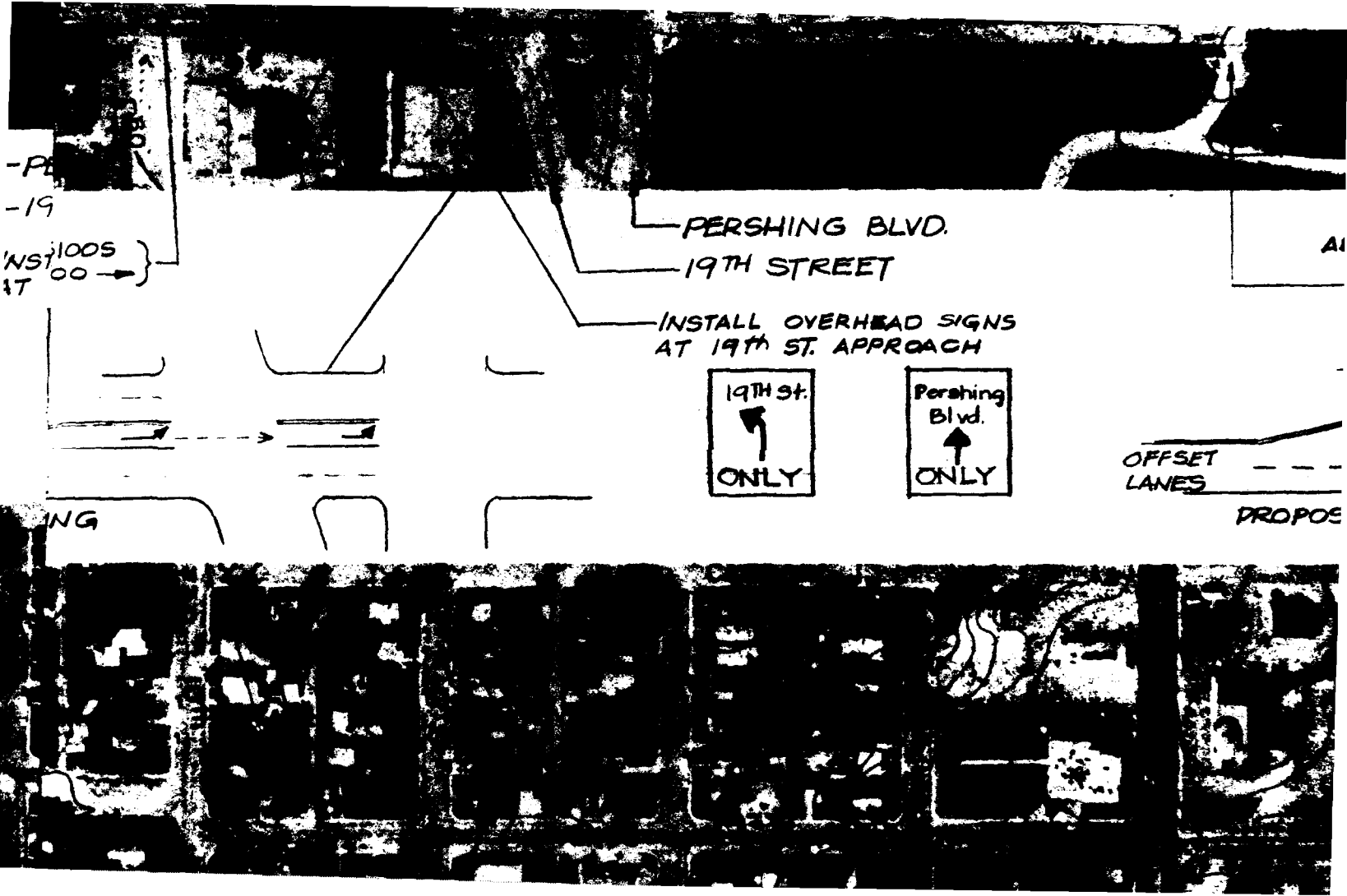
CONFUSING LEFT TURN
ARRANGEMENT AT
19TH & PERSHING

EXISTING



ADT 600

NATIONWAY



-PERSHING
-19TH
1005
100

PERSHING BLVD.
19TH STREET

INSTALL OVERHEAD SIGNS
AT 19TH ST. APPROACH

19TH St.
ONLY

Pershing
Blvd.
ONLY

OFFSET
LANES
PROPOSED

3,900

HING BLVD.
STREET

ADT 8,900

EXTEND COM
2 LANES TO
TAPER TO 1

OVERHEAD SIGNS
ST. APPROACH

1st.
LY

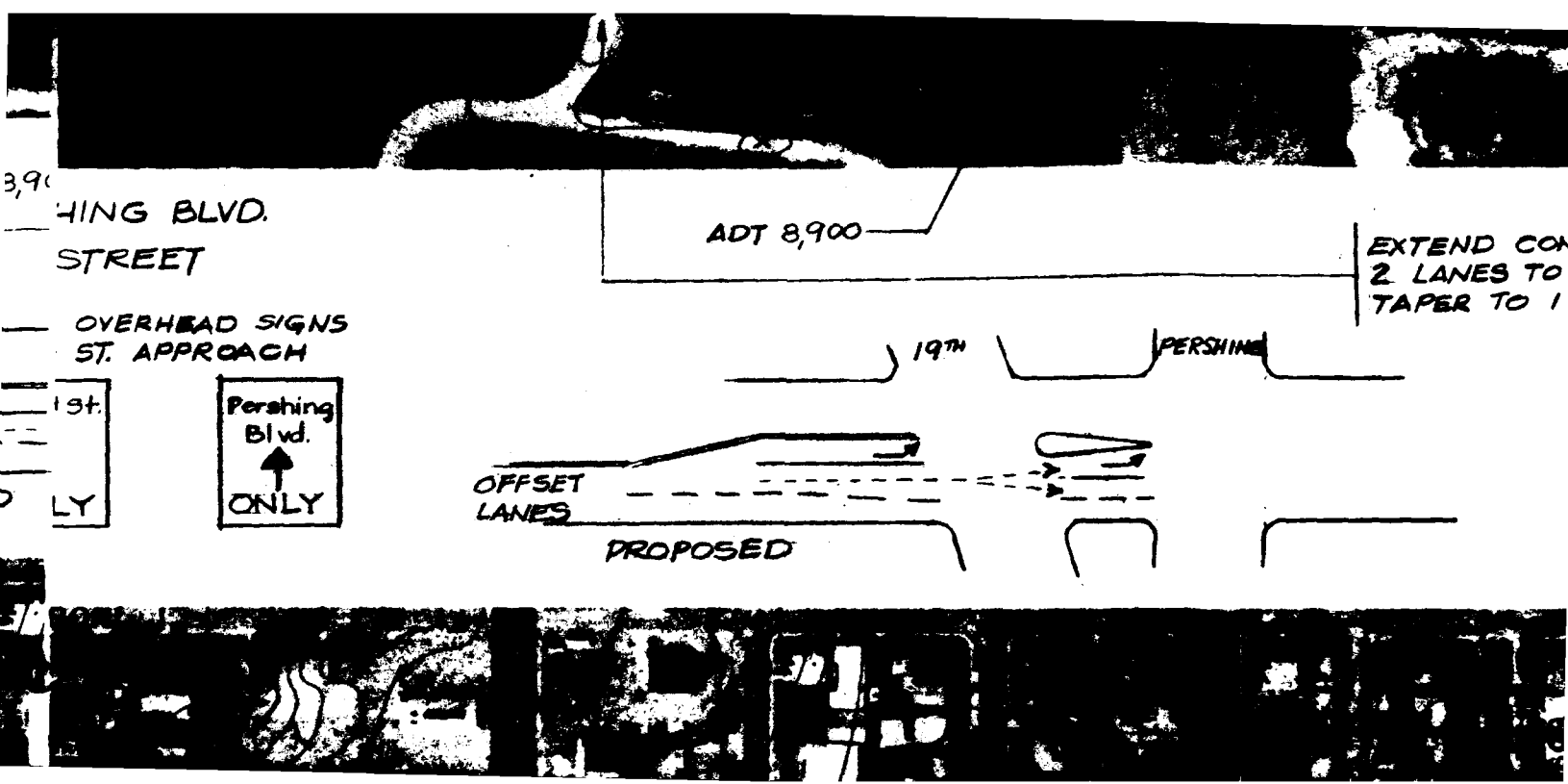
Pershing
Blvd.
↑
ONLY

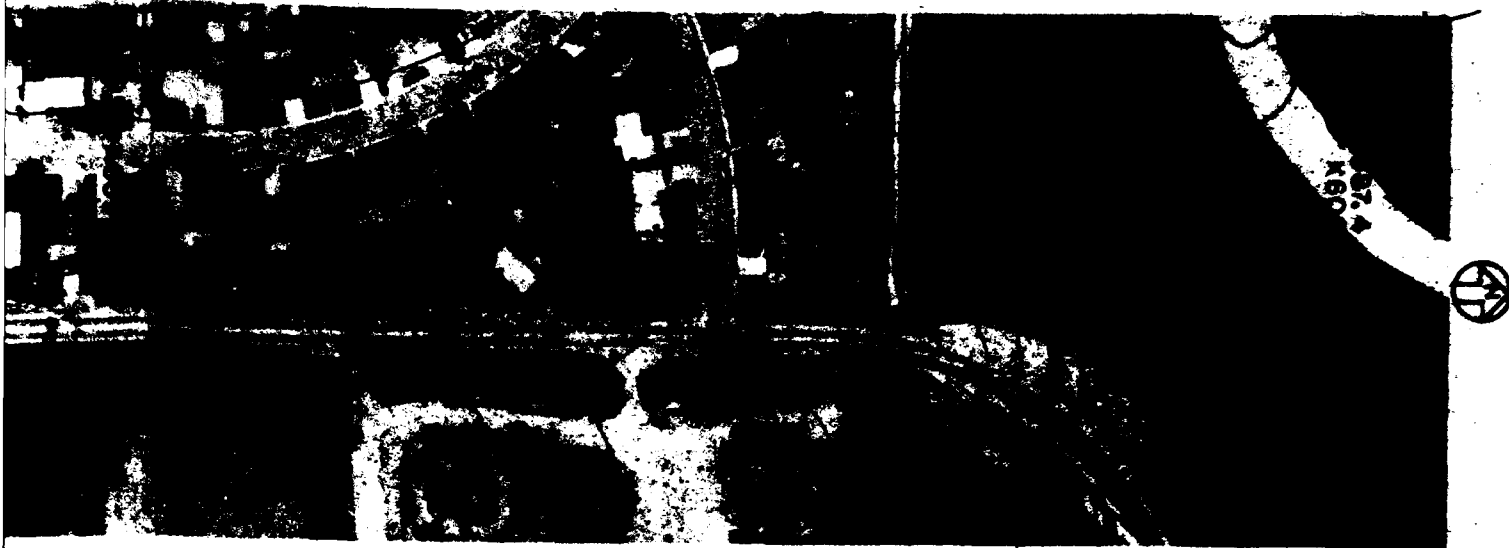
19TH

PERSHING

OFFSET
LANES

PROPOSED





EXTEND CONVERSE NB LANES WITH
2 LANES TO V.A. HOSPITAL ENTRANCE;
TAPER TO 1 LANE NORTH

PERSHING



A Professional Corporation

ARIX

Engineers Architects Planners

Greenwood, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orem, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 12 - CONVERSE AVENUE

DELL RANGE TO LINCOLNWAY

1" = 200'

12 B

DECEMBER, 1984

RM
UNT

2.13 EVANS AVENUE - 8th Avenue/Warren to Lincolnway

2.13.1 Existing Conditions

Evans Avenue, between the intersection with Central/Warren at 8th Avenue and the intersection with Lincolnway, is classified as a collector street. The 8th Avenue section near the Airport Post Office is a median divided street, which transitions through two 45 degree turns to Evans Avenue near 7th Avenue. Evans continues south past Miller School to Pershing Boulevard where it turns approximately 30 degrees and continues southeast to Lincolnway.

Throughout most of its length Evans carries one lane in each direction. On-street parking is provided except at selected locations where roadway geometrics or other restrictions make parking unsafe. No parking locations include the reverse curve in the vicinity of Miller School, and the approaches to the Pershing Boulevard intersection. From 7th Avenue south the right-of-way is 80 ft. Pavement width is approximately 44 ft. between 7th Avenue and Pershing, but south of Pershing to 24th Street the roadway width narrows to about 37 ft. From 24th Street to Lincolnway the street width is approximately 45 ft.

Critical intersections along Evans Avenue are Pershing Boulevard and Lincolnway. At the Pershing Boulevard intersection the southbound approach has a left turn only lane, and a through plus right turn lane. The northbound approach has a single lane to accommodate all movements. Both northbound and southbound approaches are forced to turn about 30 degrees through the intersection. Southbound approach to Pershing Boulevard has a ground mount lane use sign to indicate the left turn lane for Pershing Boulevard eastbound. The signal at Evans/Pershing is actuated and provides protected crossings for pedestrians when these are called.

The Evans/Lincolnway intersection really functions as a tee intersection since the south approach is a driveway from a fast food establishment. A left turn lane is marked on Lincolnway eastbound, but no separate left turn indication is provided. The north approach of Evans has a marked left turn lane, and through and right turn lanes.

Evans Avenue is one block east of the Central/Warren one-way pair. Given the preferential signal phasing from the Central/Warren pair north/south, and the 19th/20th Streets one-way pair east/ west, signal progression on Evans between Lincolnway and Pershing is poor. Both the one-way preferential timing and the short spacing between signalized intersections reduces the mainline capacity of Evans.

2.13.2 Traffic Operations Problems

Evans Avenue is a potentially attractive route past the east side of downtown Cheyenne, for traffic moving to and from north of Pershing Boulevard. In addition to poor signal progression, the

intersection approaches on Evans are one lane. This causes delay when a left turning vehicle has to wait for a gap, a problem common to intersections between Lincolnway and Pershing Boulevard.

The Pershing Boulevard intersection is awkward because of the narrow, skewed approach. Through movements are delayed northbound by left turning vehicles, and the right turn from Evans northbound to Pershing eastbound is awkward because of the 120 degree turn. A "no right turn on red" prohibition is posted because of the awkward maneuvers. Southbound a left turn lane is provided, but capacity is somewhat restricted due to the narrow approach and exit lanes.

The connection between Evans Avenue and 8th Avenue is somewhat confusing as the pavement widens considerably and there are several conflicting cross traffic movements in the northbound direction. Evans is an attractive alternate route to the north side of Cheyenne from downtown. However, the section from 7th Avenue to the Warren/8th Avenue intersection experiences substantial weaving conflict between through (westbound) and right turning (northbound) traffic, and this weaving conflict occurs in a section which has two half-turns. The two median breaks on 8th Avenue, just east of Warren, add to the confusion.

2.13.3 Planned/Programmed Improvements

No major improvement projects are scheduled for this corridor.

2.13.4 Alternative Improvement Actions

The Evans Corridor is of moderate significance for local traffic movement along the east edge of downtown Cheyenne as an alternate to the arterial corridors of Warren/Central and Pioneer/Carey. Recent traffic counts indicate volumes on the order of 5,000 - 7,000 average daily traffic, which are well within the capacity of a two lane, two way collector street. The primary problems are at a few intersections, and there is an inherent conflict in signal timing with the east-west arterials (16th/17th and 19th/20th). An alternative action which emphasizes Evans Avenue at the expense of the intersecting arterials is not considered warranted. Neither is any action which would substantially increase mainline capacity such as parking prohibition or street widening.

One option for the southbound approach to Pershing Boulevard would be to add an optional through plus left turn lane, providing a three lane approach (left, left-through, through-right). However, the exit lanes on Pershing Boulevard eastbound appear to be too narrow to comfortably allow double left turn movements. The three lane southbound approach plus the additional northbound lane would result in narrow lanes -- perhaps too narrow for safety. Further, operation of an optional left in the face of oncoming traffic is not good practice; a three phase signal would be required to permit exclusive southbound, exclusive northbound and east-west traffic movements; this reduces overall intersection capacity further.

2.13.5 Recommended Improvement Plan

Actions recommended for the Evans Avenue corridor consist of spot improvements at a few select locations, aimed at reducing weaving conflicts and increasing intersection capacity at certain critical points.

- Extend the median nose from 8th Avenue southeast with painted channelization to separate opposing traffic.
- Develop visible two lane northwest lane markings from Evans to 8th Avenue, with a ground mount sign reading "Warren Avenue North Traffic Keep Right."
- Remark the northbound approach of Evans Avenue to Pershing Boulevard to develop a separate left turn storage lane.
- Evaluate feasibility of acquiring right-of-way at the southeast corner of Evans/Pershing to permit widening of right turn lane.
- Provide more visible pedestrian crosswalk markings across all approaches.
- Preferential signal timing for Evans should favor northbound direction, since evening peak volumes are slightly higher than morning peak volumes, and northbound volumes are greater than southbound. However, priority should remain with east-west arterial traffic flow.

Consideration should be given to closing the access streets in the middle of the Evans-8th Avenue curve, and developing a parking lot in the triangular area remaining. House and 7th Avenue could continue to provide local access.

(1)



CENTRAL
AVENUE

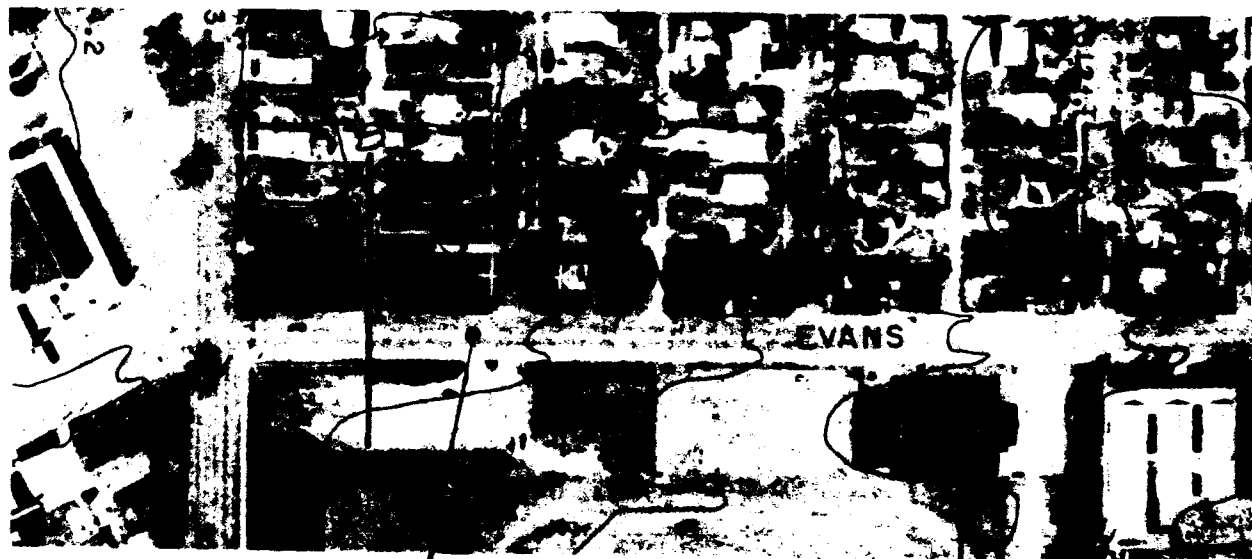
WARREN AVE.

POST OFFICE

ADD RT
LANE
WARREN N.B.

EXTEND MEDIAN
NOSE WITH PAINTED
CHANNELIZATION

CLOSE HOUSE AT 8TH,
CLOSE 7TH AT EVANS.
DEVELOP PUBLIC PARKING
AREA. IF DIRECT ACCESS
FROM EVANS IS PROVIDED
INCLUDE LT LANE



EVANS

ADT 6,500

MILLER SCHOOL

WARD LANE CONTROL NORTHBOUND
WEAVING CONFLICT BETWEEN
THROUGH (WESTBOUND) & RIGHT
(NORTHBOUND)

SK
CLOSE HOUSE AT 8TH,
CLOSE 7TH AT EVANS.
DEVELOP PUBLIC PARKING
AREA. IF DIRECT ACCESS
FROM EVANS IS PROVIDED,
INCLUDE LT LANE

SIGN: "WARREN AVENUE
NORTH TRAFFIC
KEEP RIGHT"

EVANS

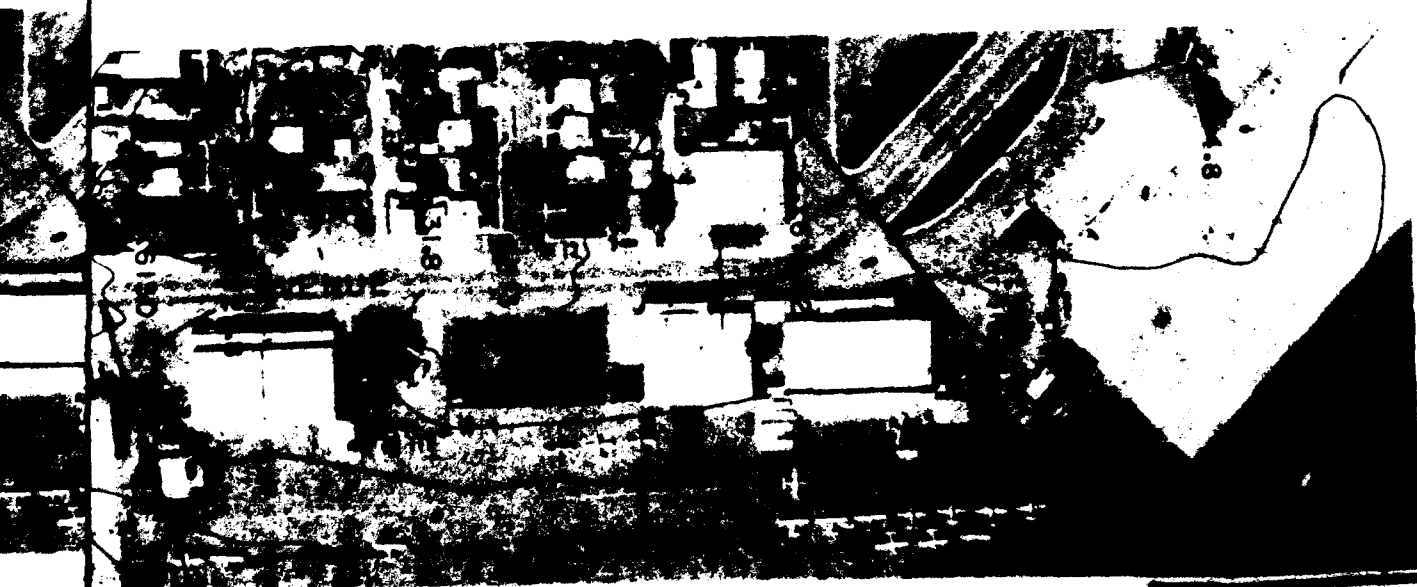
LLER SCHOOL

REVERSE CURVE
4TH TO 5TH AVE.

(3)

WARD LANE CONTROL NORTHBOUND,
WEAVING CONFLICT BETWEEN
UGH (WESTBOUND) & RIGHT
THBOUND)

RREN AVENUE
TH TRAFFIC
P RIGHT "



REVERSE CURVE
4TH TO 5TH AVE.

A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
 Grand Junction, Colorado
 Riverton, Wyoming
 Orem, Utah



A Professional Corporation

ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Orchard, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 13 - EVANS AVENUE

8TH AVENUE/WARREN TO LINCOLNWAY

1" = 200'

13 A

DECEMBER, 1984

EYEN

8TH

00'

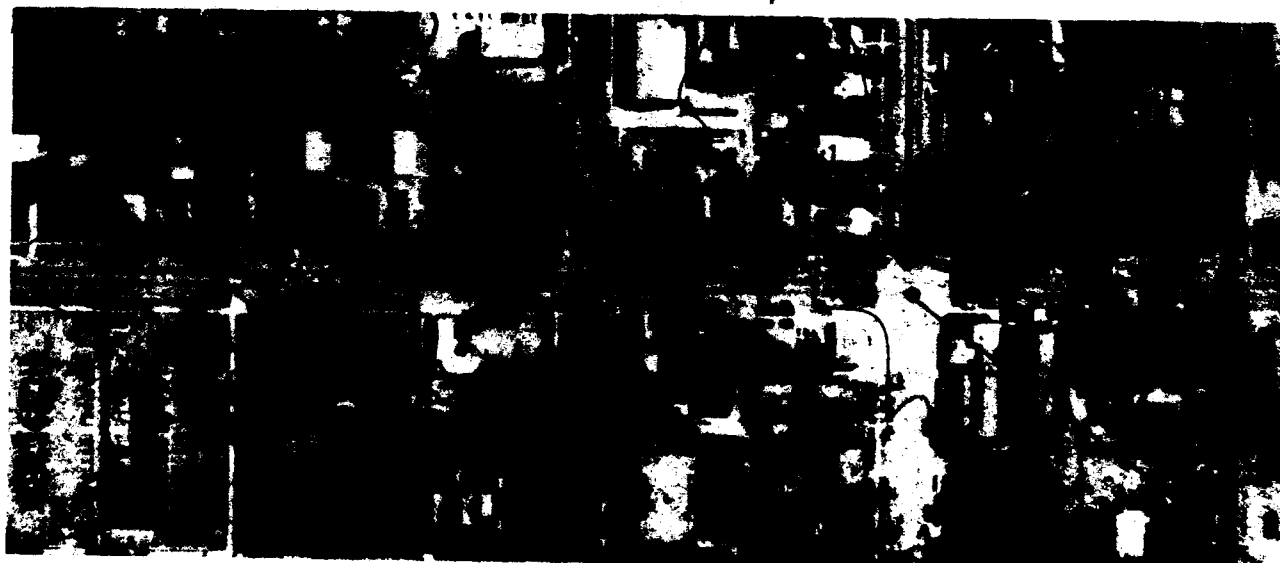
①
PERSHING
BLVD

IMPROVE RIGHT TURN
GEOMETRICS.
REQUIRES REMOVAL OF
LARGE TREE, S.E. CORNER

ADD SHORT LEFT TURN
STORAGE LANE AND WIDEN
RIGHT LANE NORTHBOUND
TO INCREASE CAPACITY

INITIAL OPTION

FUTURE OPTION



20TH

ADT 3,300
19TH

SIGNAL CONFLICT & ONE LANE APPROACH
CONSIDER SHORT LEFT TURN STORAGE LANE
AT 17TH & 20TH STREETS NORTHBOUND,
19TH STREET SOUTHBOUND

ADT 3,200—

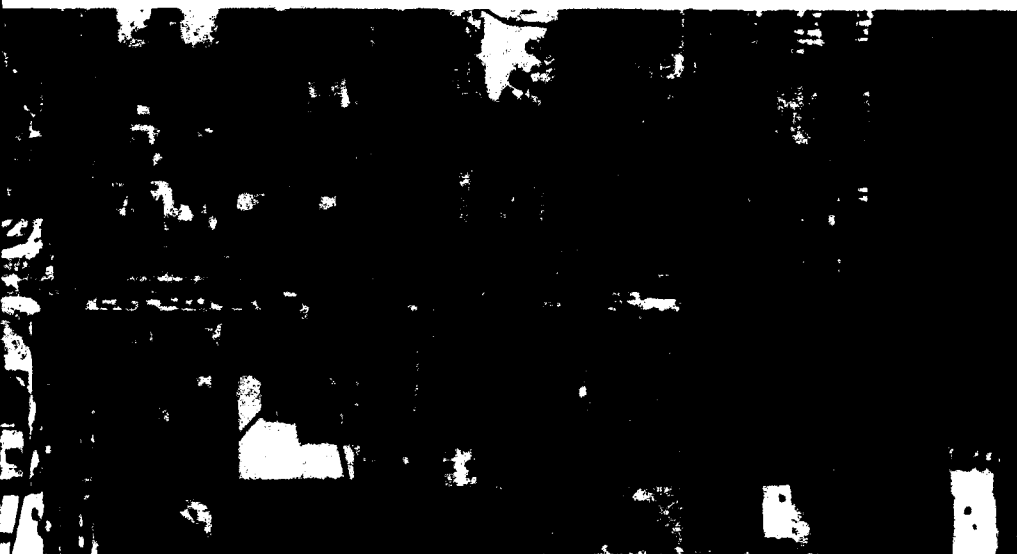
ADD SHORT LEFT TURN
STORAGE LANE AND WIDEN
RIGHT LANE NORTHBOUND
TO INCREASE CAPACITY



FUTURE OPTION



ADT 3,200



ADT 5,600

LINCOLNWAY

17TH

LINCOLNWAY

EVANS

A Professional Corporation

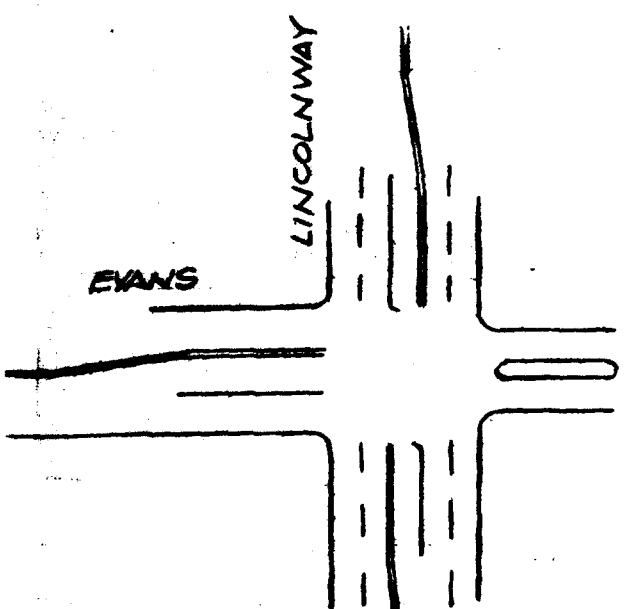
ARIX

Engineers Architects Planners

Greeley, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Oron, Utah



4



CONSOLIDATE ACCESS DRIVES TO
FAST FOOD OUTLETS ON SOUTH
SIDE OF LINCOLNWAY; SET
SIGNAL FOR ACTUATION BY
NB & SB EVANS TRAFFIC

A Professional Corporation

ARIX

Engineers Architects Planners

Griffin, Colorado
Grand Junction, Colorado
Riverton, Wyoming
Ogden, Utah

CHEYENNE IMPACT CORRIDOR STUDY

CORRIDOR 13 - EVANS AVENUE

8TH AVENUE/WARREN TO LINCOLNWAY

1" = 200'

13 B

DECEMBER, 1984

3. IMPACT CORRIDOR PLAN

3.1 General Improvement Actions

There are several traffic operations improvement actions which have been recommended for specific locations in the several impact corridors. These have general application throughout the study area as low cost, easily implemental techniques to achieve modest but real increases in level of service. Comments which supplement the recommendations in the individual corridor assessments are summarized below.

3.1.1 Pavement Marking

Pavement markings at signalized intersections throughout the study area were generally worn and not highly visible. Clear, visible lane lines, stop lines and cross-walks provide guidance to drivers, help them select and stay within the proper lane, and indicates where to stop at intersections. Special situations, such as school crossings, exclusive turn lanes or railroad crossings also benefit from clear, visible pavement markings.

Priority for marking locations can quickly be determined by examining intersection approach volumes and accident history. A primary objective should be to mark all signalized intersections, with second priority given to stop sign controlled locations. Wear resistant, reflective material should be used at intersection approaches, while paint is satisfactory for mid-block lane line and centerline marking. This combination of applications further emphasizes the intersection approach, where control is most needed.

3.1.2 Traffic Control Signs

The Manual on Uniform Traffic Control Devices, and State and local supplements to this, prescribe the guidelines and requirements for signing. During field observations a number of non-standard signs were observed, primarily no parking signs. These should be upgraded and standardized throughout the city, and one sign format should be selected and used in cases where optional formats are possible.

Mast arms at signalized intersections provide excellent locations for placement of overhead lane use control signs. This application places the signs directly in the driver's field of vision and provides advance warning of restrictions on lane usage.

3.1.3 Traffic Signals

Warrants specified in the Manual on Uniform Traffic Control Devices and State and local supplements, should be used as the basis for determining needs for traffic signals, and for guidance in developing specific designs for installations. Vehicle control signals (round lenses) should not be used to control only pedestrian crossing movements; if pedestrian signals are warranted the standard displays should be used. Existing pedestrian signal installations should be reviewed to insure they conform to standards (e.g. Pershing at Warren, north-south crossing on west side; Pioneer at Lincolnway,

north-south crossing on west side). Exclusive pedestrian phases should be used sparingly, when field studies verify high pedestrian demand and high incidence of pedestrian/vehicle conflicts; or when special classes of pedestrians frequently use a crossing (school children, handicapped persons).

Signals on arterial intersections outside the CBD (e.g. on Dell Range, Prairie, Yellowstone, Central, Pershing) should be connected to the new central computer control system to increase the flexibility of setting special timing and phasing plans to handle varying traffic demands.

Generally signal timing should give preference to progressive movement on the higher classifications of streets (e.g. favor minor arterials over collectors). Phasing should consider both traffic volume levels on each approach, and progressive movement in the major travel directions. As part of access control maintenance (see 3.1.4), requests for major site access points should be evaluated to determine their potential effects on progressive traffic movement. Applicants should be required to show that progressive movement will not be adversely affected (e.g. time-space diagram of existing conditions and proposed location) or that the proposed driveway will not generate sufficient traffic (considering proposed use and other potential use) to warrant signal control.

3.1.4 Access Control

Proposed development activities such as zoning change requests, subdivision filings and the like should be carefully reviewed to determine their potential effects on arterial and collector street capacity. Access control is equally important in newly developing areas, such as along Dell Range Boulevard and in established areas such as along Lincolnway, Pershing Boulevard or South Greeley Highway.

Specific techniques which should be considered include:

- ° Consolidation of driveways between two or three adjacent lane uses, especially when the parking areas which serve these activities are contiguous.
- ° Locating driveways on intersecting side streets so traffic moves to and from generators through controlled intersections.
- ° Construction of channelized right-in, right-out access points.
- ° Installation of barrier medians on arterial streets to prohibit cross-traffic left turns. Provisions for reasonably close U-turns or access via nearby side streets should be made.
- ° Turn prohibitions at selected intersections, especially where left turn demand can be served at an adjacent intersection.

To the extent possible applicants should be required to develop their own access control plan, negotiate with adjacent property owners if

necessary, and pay for any required reconstruction in the public right-of-way (e.g. new signals, acceleration/deceleration lanes, median breaks, curb relocation to develop additional lanes).

3.2 IMMEDIATE ACTION PLAN

The following projects are relatively simple, low cost and easily implemented actions which can be undertaken in the near future to alleviate specific problems. They are recommended for action as funding is available and as local staff can refine the conceptual plans to sufficient detail for implementation. Generally they would be accomplished by local agency staff. Planned projects which should be advanced to construction immediately are also included. Reference to the appropriate corridor study is shown and the projects are listed in suggested priority order.

1. Reconstruction the Pershing-Randall/I-25 Interchange (2.1.3, 2.7.3)
2. Reconstruct Ames/Deming south to underpass (2.5.3)
3. Improve eastbound flow on 19th, Logan to Converse (2.6.3)
4. Upgrade Logan/Pershing intersection (2.6.5)
5. Channelize Evans at Pershing (2.13.5)
6. Upgrade Randall/Snyder (2.7.5)
7. Close access drive from Carey JHS parking lot (2.1.5)
8. Upgrade Warren/8th Avenue approach (2.2.5)
9. Remove parking Lincolnway at Morrie, remark (2.3.5)
10. Sign and mark Converse at 19th Street (2.12.5)
11. Sign and mark Evans/8th Avenue (2.13.5)
12. Sign and mark Converse at Lincolnway (2.12.5)
13. Remove optional through/turn signs and markings on 17th/Pioneer-Carey and 19th/Pioneer
14. Consolidate school crossings on Avenue C (2.9.5)
15. Eliminate exclusive pedestrian phases in CBD (2.7.5)

3.3 SHORT RANGE PLAN

The following projects require detailed planning, design engineering, funding approval and public/agency review. Many are relatively low cost actions, and most should be possible to implement within a one to five year time period. The more capital intensive projects represent actions which address significant deficiencies in need of immediate correction. Reference to the appropriate corridor study is shown and the projects are listed in suggested priority order.

1. Realign and increase capacity of Yellowstone/Central intersection (2.2.5)
2. Reconstruct the Missile Drive - 19th/20th intersection (2.4.5)
3. Reconstruct the U.S. 85/Fox Farm Road intersection (2.8.5)
4. Improve westbound flow on 20th, east of Logan (2.4.5)
5. Widen Pershing Boulevard from west of Central to east of Warren to a five lane section with separate left turn lanes (2.1.5)
6. Upgrade Randall - Pioneer/Carey at 26th, 27th Streets (2.7.3, 2.7.5)
7. Channelize Morrie and Duff at 5th Street (2.9.5)
8. Widen College Drive/U.S. 85 intersection (2.11.5)
9. Widen Lincolnway/Logan approaches (2.3.5 and 2.5.5)
10. Widen and realign Converse, Pershing to Dell Range (2.12.5)
11. Improve Lincolnway, Missile Drive to Thomes (2.3.5 and 2.5.5)
12. Widen Pershing Boulevard approaches to Evans to include left turn lanes (2.1.5)
13. Widen Pershing Boulevard to five lanes from Evans east to the existing five lane section (2.1.5)
14. Reconstruct Logan/Nationway intersection (2.6.5)
15. Upgrade Lincolnway/Snyder signal (2.3.5)
16. Widen Evans at Pershing (2.13.5)
17. Signalize Snyder - 19th/20th (2.4.5)
18. Upgrade Deming/Parsley Boulevard intersection (2.5.5)
19. Upgrade Lincolnway/Evans intersection (2.3.5)
20. Upgrade College Drive/Parsley Boulevard intersection (2.11.5)

21. Channelize Morrie/1st Street (2.9.5)
22. Upgrade Walterscheid/Fox Farm Road intersection (2.8.5)
23. Upgrade Avenue C/Fox Farm Road (2.9.5)
24. Upgrade College Drive/Avenue C intersection (2.11.5)
25. Upgrade Walterscheid/College Drive intersection (2.11.5)

3.4 FUTURE IMPROVEMENT PROJECTS

The following projects should be considered for investigation and evaluation as part of the long range transportation planning process. They relate to possible future needs to serve regional travel demands, and may become warranted if the combination of Peacekeeper/Warren A.F.B. activity and regional growth results in increased traffic along certain corridors. Reference to the appropriate corridor study is shown but no priorities are assigned.

- ° Widen Pershing Boulevard to four lanes between Warren AFB/I-25 and Pioneer Boulevard (2.1.5)
- ° Realign and extend Morrie Avenue north of Pershing (2.1.5)
- ° Widen Deming and 9th Streets to new Norris viaduct (2.5.5, 2.9.3)
- ° Extend Converse north of Dell Range (2.10.5)

TRAFFIC IMPACT STUDY
(Warren Air Force Base Traffic)

Cheyenne, Wyoming

October 1984

Prepared For:

ARIX p.c.
800 Eighth Avenue
P. O. Box 2021
Greeley, CO 80632-2021

Prepared By:

William R. Cloyd, P.E.
515 E. Pershing Blvd. #260
Cheyenne, WY 82001

I. Introduction

During the months of September and October 1984, a Traffic Impact Study was undertaken in Cheyenne, Wyoming. This study was completed to determine what impacts the Warren Air Force Base traffic has upon the existing major street network in Cheyenne. This study was completed by Bill Cloyd, Engineer Consultant to ARIX p.c. as part of the Cheyenne-Laramie County Transportation Planning Study for the Peacekeeper project.

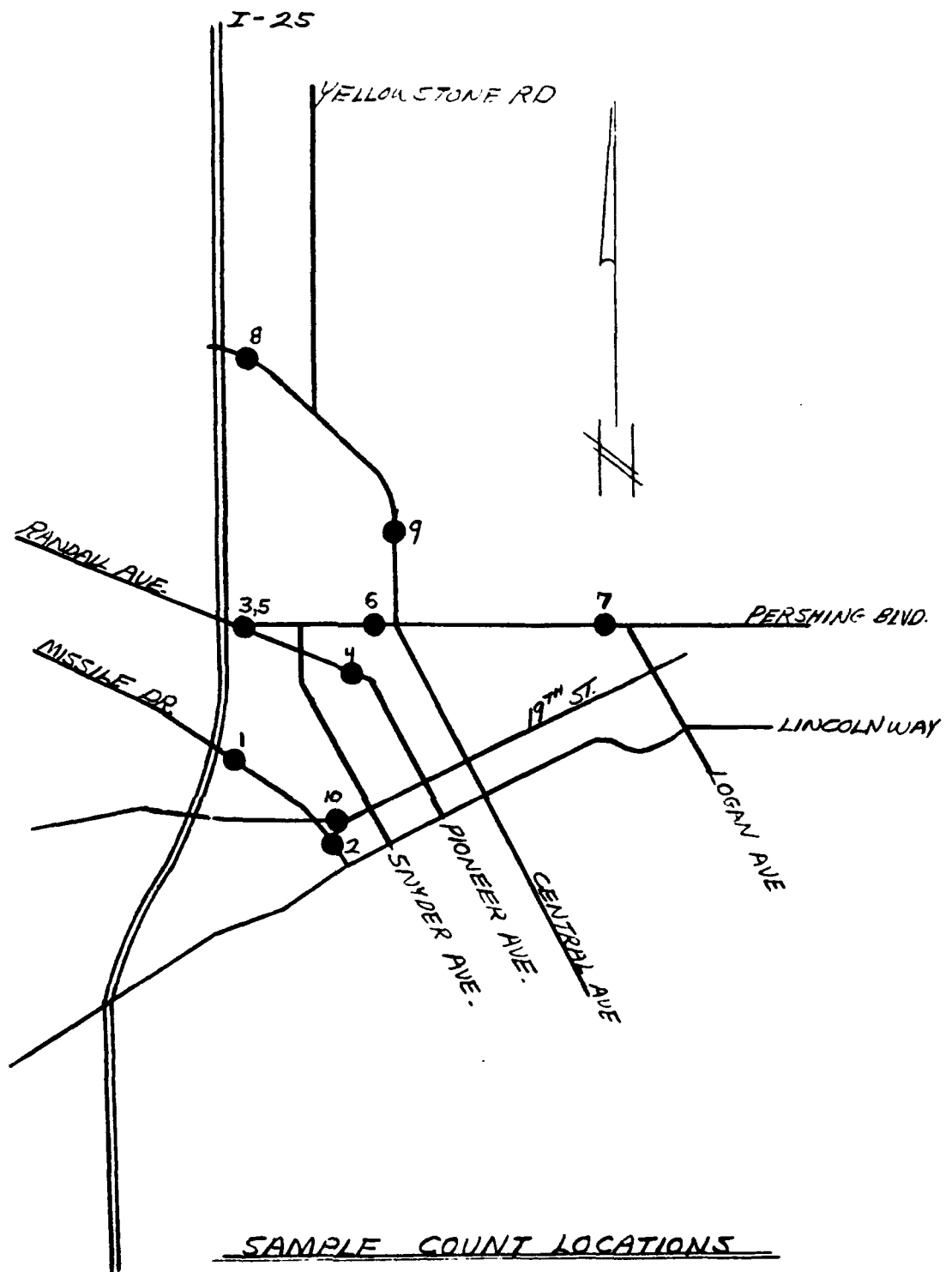
The following chapters discuss how this study was undertaken, with Chapter II describing in detail the data collection, analysis and results. Chapter III presents the conclusions.

II. Data Collection and Analysis

In order to determine the impacts, 21 sample peak hour traffic counts were collected at ten (10) locations. The locations are shown on Fig. I. These sample locations were selected on major routes where it was felt base traffic would have the largest impact. At each of these sample locations, vehicles were counted for $\frac{1}{2}$ hour during the morning and late after on peak hours.

Table I lists the station numbers, locations, dates, time and direction for each of these traffic counts. In order to collect data, vehicles were classified as "base" and "non base". The "base" vehicles were determined by the special bumper sticker required by motorists for entrance to the base. Therefore, it was assumed that if a base bumper sticker was visible on the vehicle, the trip was base related and impacted the location where the traffic count was taken. During traffic counts, it was noted that some vehicles were entering or leaving the base but did not have a bumper sticker. The exact percentage or number of vehicles without stickers entering or leaving the base is unknown. All vehicles, with or without stickers, were counted at stations adjacent to the base. At stations not adjacent to the base only vehicles with stickers were counted. It was also noted that during the counts adjacent to the base, nearly 100% of the vehicles with bumper stickers entered or left the base.

Following the data collection, the sample counts were analyzed and summarized. Table I also shows the summary of the traffic counts at each of the stations by total volume, "base" volume and "non base" volumes. The "base" and "non base" volumes are also summarized by percentages. From the 21 sample counts, there were a total of 4,040 vehicles observed. Of these 1,324 (33%) were observed to have a "base" sticker and were assumed as a "base" related trip. As part of this study, it was assumed that the percentage of "base" and "non base" trips would remain constant throughout the peak hour and that the sample $\frac{1}{2}$ hour counts could be expanded to hourly counts.



SAMPLE COUNT LOCATIONS

(FIGURE 1)

TABLE I
COUNT STATIONS

STA.	STREET	LOCATION	DIR.	DATE	TIME	TOTAL VOLUME	% BASE	% NON BASE
1	Missile Drive	E. of I-25	EB	10-02-84	4:45 pm-5:15 pm	110	35 (32%)	75 (68%)
1	Missile Drive	E. of I-25	WB	10-02-84	7:15 am-7:30 am			
1	Missile Drive	E. of I-25	WB	9-20-84	7:15 am-7:30 am	111	59 (53%)	52 (47%)
2	Missile Drive	N. of Lincolnway	NB	10-03-84	7:00 am-7:30 am	56	26 (46%)	30 (54%)
2	Missile Drive	N. of Lincolnway	SB	10-02-84	4:10 pm-4:30 pm	64	26 (41%)	38 (59%)
3	Randall Avenue	E. of I-25	EB	9-24-84	4:15 pm-4:30 pm			
3	Randall Avenue	E. of I-25	EB	9-24-84	5:15 pm-5:30 pm	126	115 (91%)	11 (9%)
3	Randall Avenue	E. of I-25	WB	9-24-84	7:45 am-8:15 am	79	45 (57%)	34 (43%)
3	Randall Avenue	E of I-25 (NB to I-25)	EB	9-24-84	5:00 pm-5:30 pm	80	78 (98%)	2 (2%)
4	Randall Avenue	W. of Pioneer Avenue	EB	9-24-84	4:55 pm-5:10 pm			
4	Randall Avenue	W. of Pioneer Avenue	EB	9-24-84	5:55 pm-6:10 pm	146	84 (58%)	62 (42%)
4	Randall Avenue	W. of Pioneer Avenue	WB	9-24-84	7:05 am-7:20 am			
4	Randall Avenue	W. of Pioneer Avenue	WB	9-24-84	8:40 am-8:55 am	84	52 (62%)	32 (38%)
5	Pershing Blvd.	E. of I-25	EB	9-24-84	4:15 pm-4:30 pm			
5	Pershing Blvd.	E. of I-25	EB	9-24-84	5:15 pm-5:30 pm	108	106 (98%)	2 (2%)
5	Pershing Blvd.	E. of I-25	WB	9-24-84	7:45 am-8:15 am	91	83 (91%)	8 (9%)
6	Pershing Blvd.	W. of Central Avenue	EB	9-24-84	4:35 pm-4:50 pm			
6	Pershing Blvd.	W. of Central Avenue	EB	9-24-84	5:35 pm-5:50 pm	259	153 (59%)	106 (41%)
6	Pershing Blvd.	W. of Central Avenue	WB	9-24-84	7:25 am-7:40 am			
6	Pershing Blvd.	W. of Central Avenue	WB	9-24-84	8:20 am-8:35 am	151	51 (34%)	100 (66%)
7	Pershing Blvd.	W. of Logan Avenue	EB	10-01-84	4:50 pm-5:20 pm	564	90 (16%)	474 (84%)
7	Pershing Blvd.	W. of Logan Avenue	WB	9-26-84	7:30 am-8:00 am	358	56 (16%)	302 (84%)
8	Central Avenue	*E. of I-25	EB	9-25-84	4:25 pm-4:55 pm	406	57 (14%)	349 (86%)
8	Central Avenue	*E. of I-25	WB	10-01-84	7:30 am-8:00 am	212	39 (18%)	173 (82%)
9	Central Avenue	*E. of Yellowstone Road	EB	10-01-84	4:10 pm-4:40 pm	479	65 (14%)	414 (86%)
9	Central Avenue	*E. of Yellowstone Road	WB	10-01-84	7:00 am-7:30 am	377	67 (18%)	310 (82%)
10	19th Street	E. of Missile Drive	EB	10-10-84	4:15 pm-4:45 pm	107	32 (30%)	75 (70%)
10	19th Street	E. of Missile Drive	WB	10-10-84	7:10 am-7:40 am	72	25 (35%)	47 (65%)
TOTAL						4,040	1,324	2,716

*It was observed that the Base gate was locked on the west side of Central Avenue interchange during these counts.

III. Conclusions

As a result of this Traffic Impact Study, it is concluded that the major routes in Cheyenne are impacted by Warren Air Force Base traffic during the A. M. and P. M. peak hours. An estimate of these traffic impacts to the city streets can be made by using the percentages of "base"/"non base" traffic contained in Table I during the peak hours.

APPENDIX B
TECHNICAL REFERENCES

1. Final Environmental Planning Technical Report - Transportation, Department of the Air Force, January 1984.
2. Urban System and Functional Classification (map), Cheyenne and Laramie County, Wyoming, 1983.
3. "Accident Data" - Reports by the City of Cheyenne, Public Works Department on accident statistics for 1981, 1982, 1983.
4. 16th/17th Streets Corridor Study, ARIX Engineers Architects Planners, September 1983.
5. South Cheyenne Traffic and Inner Drive Feasibility Study, Jack Noblitt and Associates, August 1982.
6. City of Cheyenne, Traffic Counts by Station and Date, Traffic Division, January 31, 1984.
7. Manual on Uniform Traffic Control Devices, National Advisory Committee on Uniform Traffic Control Devices, Federal Highway Administration, 1978 (revised).

PROJECT PARTICIPANTS

Wyoming Office of Industrial Siting Administration

Richard C. Moore, Director
Rebecca L. Mathisen, Staff Engineer

Wyoming Highway Department

Max Kaser, Urban Transportation Planning Engineer
Mike Gostovich, Staff Engineer, Operations
Timothy Carroll, Transportation Engineer

Laramie County

Robert Whitney, County Engineer (retired)
Pete Hutchison, County Engineer

City of Cheyenne

Brant Williams, Traffic Engineer

Cheyenne - Laramie County Planning Office

James T. Bonds, Director

Cheyenne Area Transportation Planning Process

Ralph J. Cipriani, Transportation Planner

Federal Highway Administration

Al Atkins, Engineering Coordinator and Safety Engineer

ARIX Engineers Architects Planners

Stephen M. Blue, P.E.
Edward C. Endicott, P.E.
James N. George, P.E.
Kerry C. Boekenkamp, P.E.
James G. Faulhaber
Norma H. Cordiner
Deborah J. Brodzinski
Kristi A. Vittetoe
Betty A. Durgan

William Cloyd, P.E., Consultant