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RELOCATED U.S. 20
in Hardin and Grundy Counties

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
Submitted Pursuant to 42 USC 4332(2)(c)
(and where applicable, 49 USC 303) by the

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
and
IOWA DEPARTMENT OF TRANSPORTATION
Planning and Research Division
Office of Project Planning

June 25, 1991
Date of Approval

Harry S Budd
For Iowa Department of Transportation

6/28/91
Date of Approval

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For FHWA

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This document pertains to the relocation of U.S. 20 on new alignment from U.S. 65 south of Iowa Falls in Hardin County east to existing relocated U.S. 20 at the Grundy/Black Hawk County line.

Comments on this draft EIS are due by **16 September 1991** and should be sent to:

Mr. Harry Budd
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FEDERAL HIGHWAY ADMINISTRATION
ADMINISTRATIVE ACTION
DRAFT ENVIRONMENTAL IMPACT STATEMENT

RELOCATED U.S. 20 IN
HARDIN AND GRUNDY COUNTIES

SUMMARY OF STATEMENT

Description of Action

This project pertains to the approximately 40-mile relocation of U.S. 20 through Hardin and Grundy Counties in north central Iowa. The planned improvement consists of new two-lane construction on four-lane right-of-way from U.S. 65 south of Iowa Falls east to existing relocated U.S. 20 at the Grundy/Black Hawk County line. See Figure 1.

Actions by Other Federal Agencies

There are no actions by other federal governmental agencies proposed within the same geographic location under study for this highway improvement.

Alternatives

One common alignment construction alternative with four variations through the Hardin County greenbelt area are being considered for this improvement. A combination of the common alignment and one greenbelt variation would be used to construct relocated U.S. 20 within the study corridor.

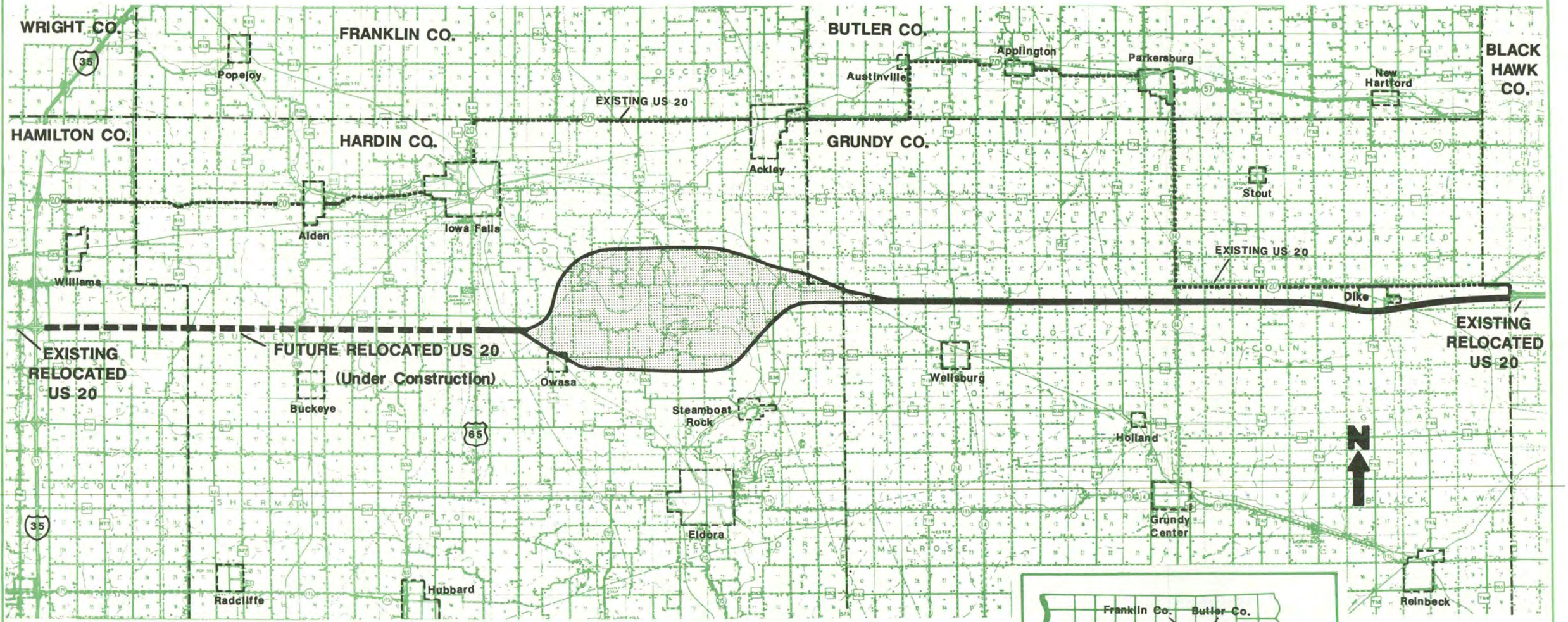
Major Environmental Impacts

Construction of a highway through the study corridor will require the conversion of agricultural and woodland areas to transportation uses and will require a bridge crossing of the Iowa River within the Hardin County greenbelt. Additionally, it is estimated that 4 farmsteads may be displaced by the proposed action.

Benefits anticipated to be derived from the project include improved traffic service and safety in the U.S. 20 corridor, improved access to north central Iowa, and an improved economic climate within the study corridor through construction and upgrading of a major transportation facility.

Areas of Controversy and Concern

Controversial issues involve intrusion of a transportation facility into the Hardin County greenbelt and the conversion of agricultural lands and/or diagonal severance associated with an alignment that would reduce possible project impacts



PROJECT STUDY CORRIDOR
FOR RELOCATED US 20
IN HARDIN AND GRUNDY COUNTIES

FIGURE 1

to the greenbelt area. Also of concern are the potential beneficial economic effects to the area that would accrue as a result from construction of a modern transportation facility.

Additional concerns include the need to modernize the existing highway (which at some locations is over 60 years old) to meet present-day and future traffic service demands and the need to complete the relocation of U.S. 20 across north central Iowa, which is a major link in the state's commercial network of highways.

Unresolved Issues

With the exception of alternative selection and appropriate project mitigation for this highway improvement, there are no unresolved issues pending with other governmental agencies.

Actions Required by Other Governmental Agencies

Project construction will require Section 404 permits from the U.S. Army Corps of Engineers and state permits for floodplain encroachment. Any necessary Section 4(f) processing will require a mitigation plan developed through consultation with the Hardin County Conservation Board.

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PURPOSE AND NEED FOR ACTION

Background

This improvement has been the subject of considerable previous development work by the Iowa State Highway Commission and its successor, the Iowa Department of Transportation in an attempt to construct a modern four-lane highway facility through central Iowa, as part of the larger statewide U.S. 20 corridor improvement. These efforts span over 20 years and have been marked by ongoing controversy and opposition to a relocation of U.S. 20 due to potential impacts within the study corridor. The principal concerns in this respect have been project encroachment on natural areas adjacent to the Iowa River in Hardin County as well as possible diagonal farm severances and farmland conversions that could result if the project is constructed.

Ultimately funding constraints, local opposition, and concerns about the environmental aspects of the project, together with pressure from local, state, and federal agencies concerned with environmental issues led to suspension of further project development.

A summary of actions taken to date on this project is as follows:

August 1967 - Public Hearing.

October 1967 - Bureau of Public Roads approval of alternative selection.

May 1974 - Draft environmental impact statement (EIS) prepared.

June 1974 - Public information meeting held to discuss draft EIS.

September 1974 - Iowa State Highway Commission approves Alternative 2 through the Hardin County greenbelt. This decision reaffirms the state decision of 1967.

November 1974 - Final environmental impact statement prepared.

December 1977 - Final EIS approved and adopted by FHWA.

January 1978 - Field review of greenbelt requested by U.S. Fish and Wildlife Service.

December 1978 - FHWA requests reevaluation before further development is approved.

January 1979 - Project is dropped from Iowa DOT five-year transportation improvement program.

January 1980 - Project development ceases.

December 1984 - Project reenters Iowa DOT transportation improvement program.

June 1987 - Pre-location study completed.

September 1987 - Public meetings to review the pre-location study.

March 1988 - Iowa DOT Commission approves EIS study corridor.

September 1988 - Work begins on draft EIS.

Purpose of Project

The proposed relocation of U.S. 20 will comprise a connecting link in the relocated U.S. 20 corridor, a modern, high capacity facility which extends the width of Iowa from Sioux City in the west to Dubuque in the east. As shown in Figure 2, a majority of this route has been relocated and is currently either constructed and open to traffic or under construction. The Hardin/Grundy County portion will be one of the final segments to be studied in this statewide improvement and would be the final segment of U.S. 20 to be improved between Fort Dodge and Dubuque.

When completed, relocated U.S. 20 will form an important facet of Iowa's Commercial and Industrial Network of Highways, which is the cornerstone of the Iowa 2000 Transportation Plan adopted by the Iowa General Assembly in 1989.

Transportation 2000 is Iowa's comprehensive, intermodal transportation package, that proposes to upgrade 2,300 miles of the state's highways to serve as a network of commercial and industrial routes while providing high level traffic service to all parts of the state. The Commercial Network feeds the interstate system, and together these routes carry over 75 percent of Iowa's highway commerce. Moreover, 80 percent of all Iowans live within 10 miles of these highway systems.

Initial emphasis in this program will be to modernize and rebuild the entire 2,300-mile Commercial Network to the best two-lane highway standards, with some four-lane construction where warranted by traffic volumes. U.S. 20 has been identified as a major component of this system and as noted, considerable development and construction has already taken place to meet the Iowa legislative mandate expressed by Transportation 2000.

A second, equally important function of the proposed action is to upgrade the existing transportation network in the study corridor to serve local needs and provide linkage to Iowa's interstate system. Additionally, the upgraded facility is being designed to increase capacity by replacing the present U.S. 20 route (a 1920s vintage design) with a new highway designed to modern standards and located in a corridor away from urban centers and smaller rural communities which tend to restrict the free flow of traffic. Because of the condition and restrictions which exist along the route of present U.S. 20, much of the through regional traffic is using more direct, parallel county roads. The planned improvement to

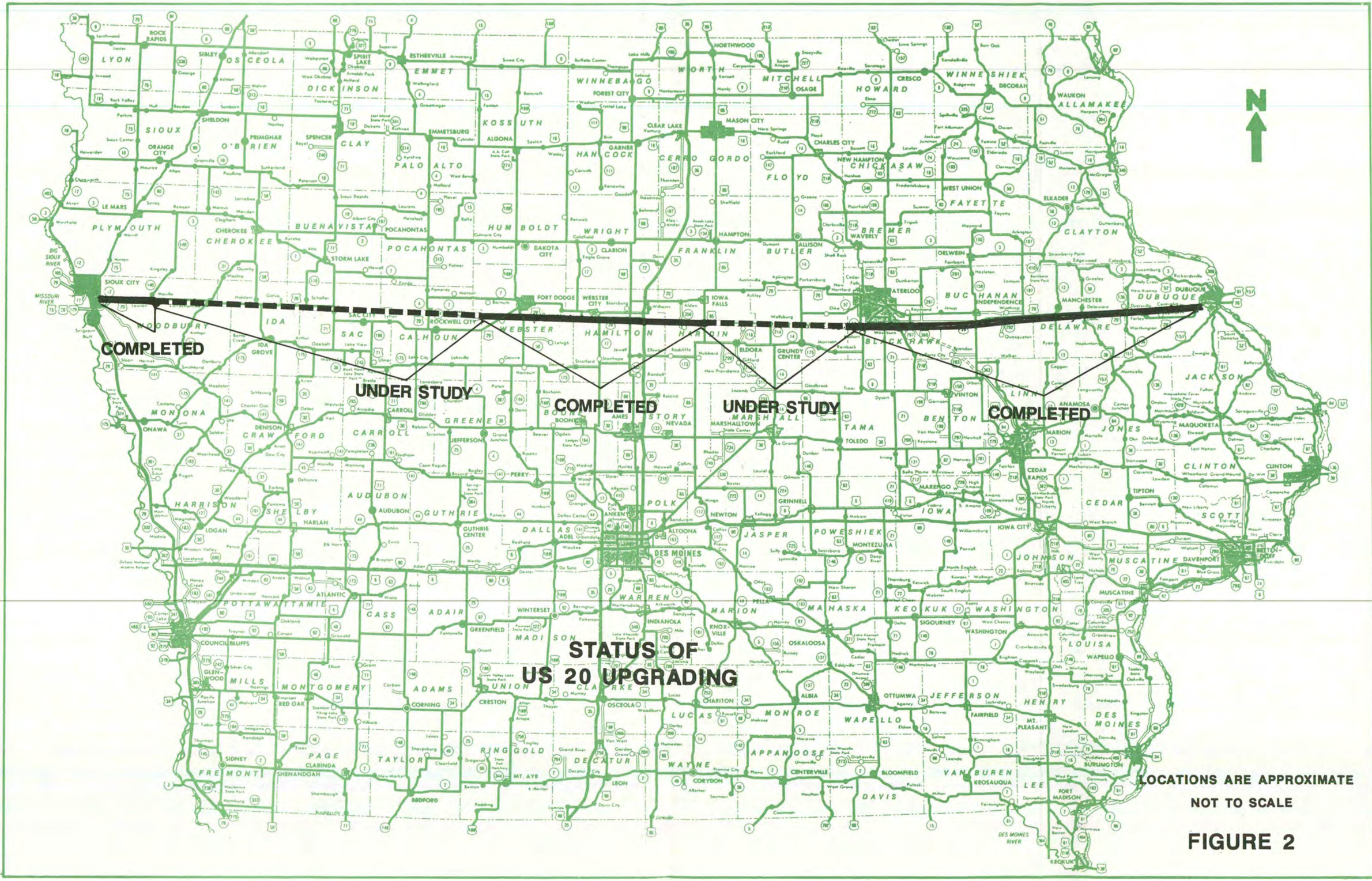

COMPLETED
UNDER STUDY
COMPLETED
UNDER STUDY
COMPLETED
STATUS OF
US 20 UPGRADING
N
LOCATIONS ARE APPROXIMATE
NOT TO SCALE

FIGURE 2

U.S. 20 will improve service and safety at existing traffic levels as well as provide for future transportation demands in the corridor.

Need for the Project

Within the corridor under study in this environmental impact statement relocation of U.S. 20 will involve replacement of the present U.S. 20 route, an alignment that comprises a 55-mile, two-lane roadway through six communities and four counties. The planned new facility will be a 38±-mile highway through the rural portions of two counties. It will provide a direct connection to existing relocated U.S. 20 in Black Hawk County with the relocated route of U.S. 20 from Interstate 35 east to U.S. 65 in Hamilton and Hardin Counties. It will also divert traffic from state highway Iowa 175 and paved county roads within the corridor.

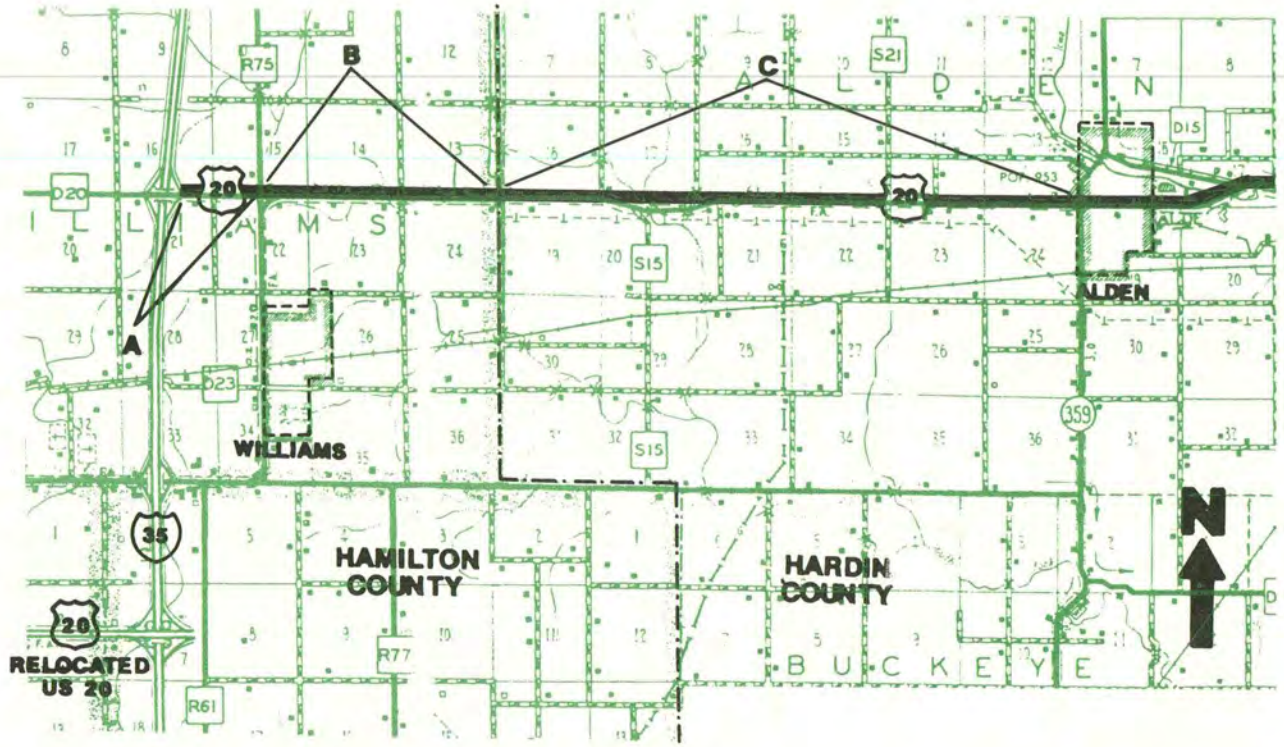
Existing roadway conditions are shown in Figures 3 and 4. This data indicates present U.S. 20 to be a two-lane, 24-foot roadway (with some short 22-foot sections) with a freeway-expressway classification (a designation noting high-capacity, limited access highways). Surface characteristics include both portland cement concrete and asphaltic concrete surfaces, with granular shoulders varying from six to eight feet in width.

In determining the adequacy of the present U.S. 20 highway to accommodate existing and future traffic volumes, a sufficiency study, accident review, and predicted traffic volumes were used to determine approximate service levels.

Sufficiency continuity ratings for U.S. 20 are shown in Figures 3 and 4. This rating is composed of three basic factors; structural adequacy, safety, and service, and is used to measure highway condition and capability in meeting traffic service demands, both present and future. In compiling a sufficiency rating five categories are used to indicate the overall sufficiency level on a segment of roadway. These five categories are shown below:

Points	Rating
90 - 100	Excellent
80 - 90	Good
65 - 79	Tolerable
50 - 64	Poor
0 - 49	Critical

As shown in Figures 3 and 4, about 14 miles of the existing route falls within the critical range with an additional four miles listed as poor. Twenty-one miles fall within the tolerable range with the balance listed as good to excellent. (Note: Mileages are approximate, ratings based on rural segments and do not include urban ratings.)



US 20 IN HAMILTON AND HARDIN COUNTIES

PAVEMENT STATUS

SECTION	LENGTH	SURFACE TYPE	PAVEMENT WIDTH	SHOULDER WIDTH	SUFFICIENCY RATING	
A	1.22 MI.	AC	22 FT.	8 FT.	51	POOR
B	2.33 MI.	AC	24 FT.	8 FT.	63	TOLERABLE
C	6.05 MI.	AC	24 FT.	7 FT.	86	GOOD

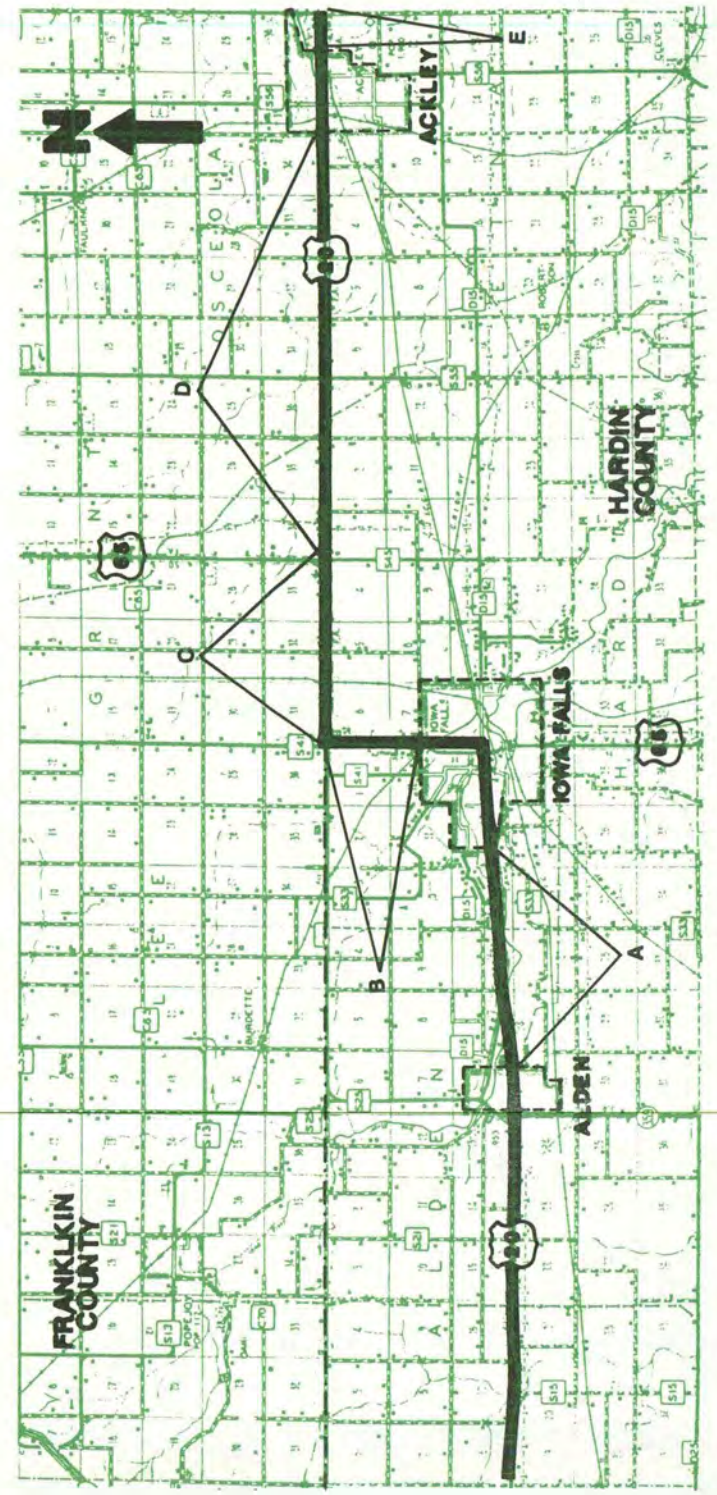
FUNCTIONAL CLASSIFICATION: FREEWAY

PAVEMENT HISTORY

SECTION A: Constr. Yr.: 1932 Resurf. Yr.: 1984

SECTION B: Constr. Yr.: 1932 Resurf. Yr.: 1984

SECTION C: Constr. Yr.: 1932 Resurf. Yr.: 1984



US 20 IN HARDIN COUNTY

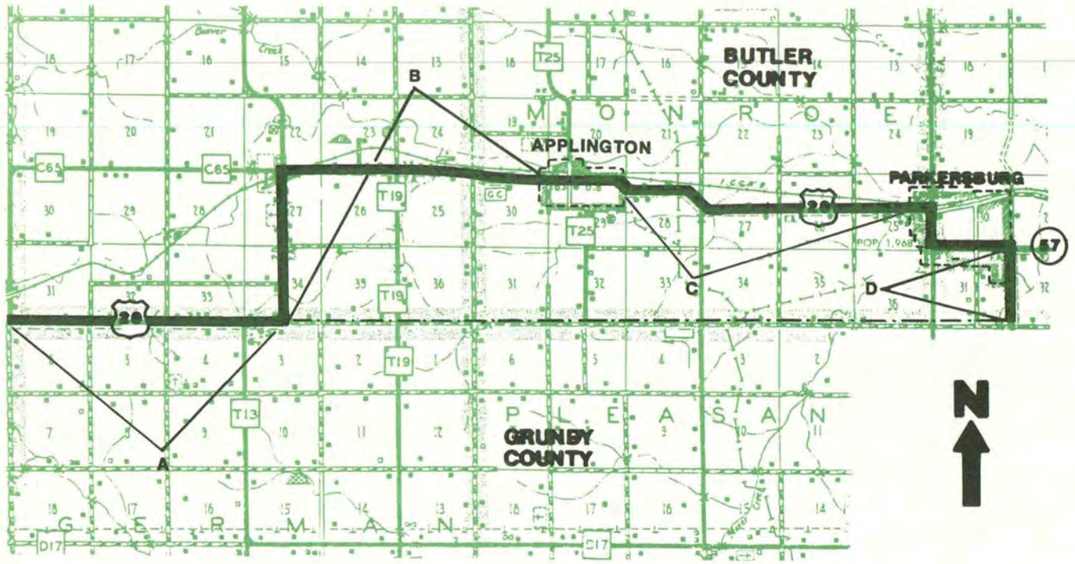
PAVEMENT STATUS

SECTION	LENGTH	SURFACE TYPE	PAVEMENT WIDTH	SHOULDER WIDTH	SUFFICIENCY RATING	FUNCTIONAL CLASSIFICATION
A	3.55 MI.	AC	24 FT.	7 FT.	28	CRITICAL
B	1.59 MI.	AC	24 FT.	7 FT.	22	CRITICAL
C	2.76 MI.	AC	24 FT.	7 FT.	72	TOLERABLE
D	7.04 MI.	AC	24 FT.	7 FT.	60	POOR
E	.63 MI.	AC	24 FT.	4 FT.	29	CRITICAL

PAVEMENT HISTORY

SECTION A	Constr. Yr.: 1932	Resurf. Yr.: 1984
SECTION B	Constr. Yr.: 1930	Resurf. Yr.: 1981
SECTION C	Constr. Yr.: 1930	Resurf. Yr.: 1981
SECTION D	Constr. Yr.: 1930	Resurf. Yr.: 1981
SECTION E	Constr. Yr.: 1930	Resurf. Yr.: 1966

FIGURE 3



US 20 IN BUTLER AND GRUNDY COUNTIES

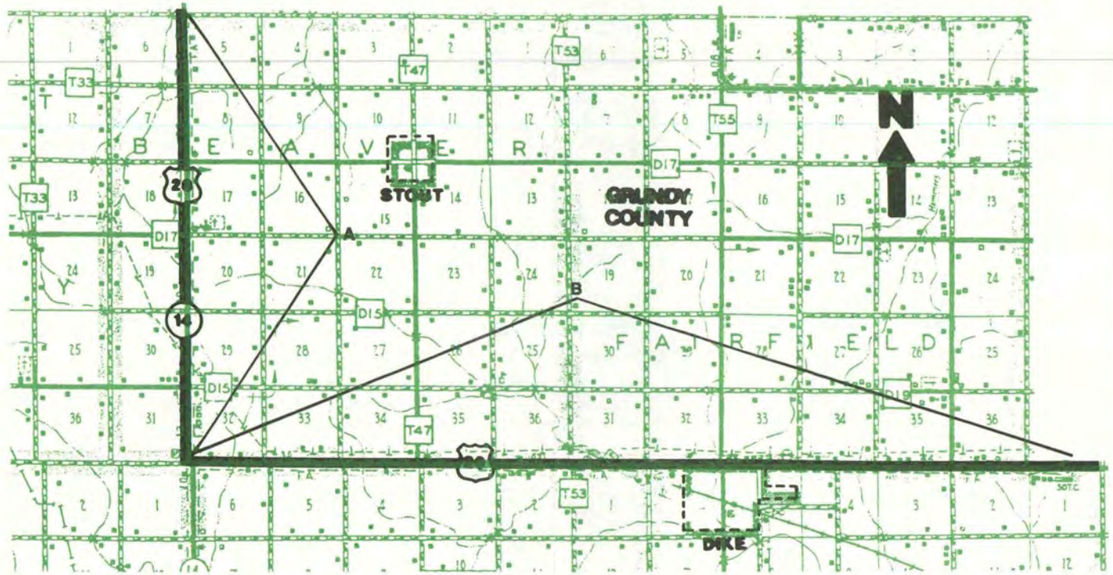
PAVEMENT STATUS

SECTION	LENGTH	SURFACE TYPE	PAVEMENT WIDTH	SHOULDER WIDTH	SUFFICIENCY RATING	
A	3.45 MI.	AC	24 FT.	4 FT.	44	CRITICAL
B	5.46 MI.	AC	24 FT.	4 FT.	48	CRITICAL
C	3.88 MI.	AC	24 FT.	4 FT.	28	CRITICAL
D	1.00 MI.	PC	22 FT.	8 FT.	57	POOR

FUNCTIONAL CLASSIFICATION:
SECTIONS A - C: FREEWAY SECTION D: EXPRESSWAY

PAVEMENT HISTORY

SECTION A: Constr. Yr.: 1930 Resurf. Yr.: 1963
SECTION B-C: Constr. Yr.: 1929 Resurf. Yr.: 1962
SECTION D: Constr. Yr.: 1952



US 20 IN GRUNDY COUNTY

PAVEMENT STATUS

SECTION	LENGTH	SURFACE TYPE	PAVEMENT WIDTH	SHOULDER WIDTH	SUFFICIENCY RATING	
A	6.09 MI.	AC	22 FT.	4 FT.	71	TOLERABLE
B	11.95 MI.	AC	24 FT.	9 FT.	63	POOR

FUNCTIONAL CLASSIFICATION: EXPRESSWAY

PAVEMENT HISTORY

SECTION A: Constr. Yr.: 1930 Resurf. Yr.: 1963
SECTION B: Constr. Yr.: 1986

FIGURE 4

Existing and predicted traffic volumes are shown in Figure 5. The range of traffic volumes in the major communities within the study corridor are as follows:

U.S. 20

Dike:	4,790
Iowa Falls:	6,074
Ackley:	3,238
Applington:	3,258
Parkersburg:	4,830

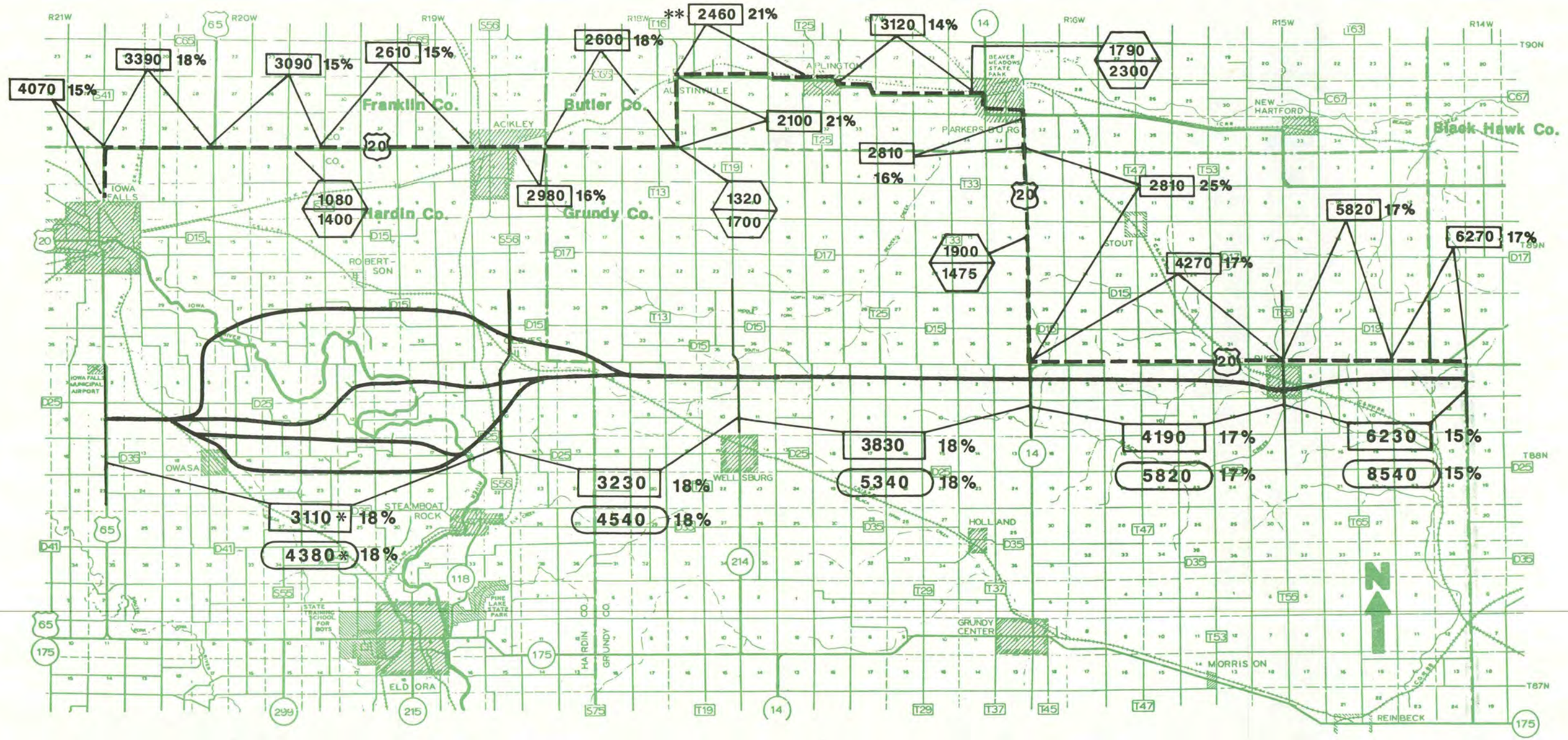
Accident Study

Data for existing U.S. 20 and Iowa 175 alignments within the study corridor was derived from Iowa DOT files on reportable accidents (i.e. those of $500 or more damages or personal injury) and include the years 1985 through 1989. Accident rates are based on five-year averages for the period 1985 through 1989. A breakdown of rural accidents is shown in Figure 6. In general, project area rates are below the Iowa statewide rates for similar highways. A compilation of accident data for U.S. 20 in urban locations is shown in the following tables.

TABLE 1

SUMMARY OF
EXISTING U.S. HIGHWAY 20
URBAN ACCIDENTS BY COMMUNITY
1985-89

Community	Fatal	Personal Injury	Property Damage	Total	Rate
Ackley	0	6	12	18	319
Alden	0	6	7	13	355
Applington	0	4	20	24	502
Iowa Falls	1	44	134	179	458
Parkersburg	0	6	16	22	127
Statewide Accident Rate for Urban Primary Highways					560



EXISTING AND PREDICTED TRAFFIC VOLUMES FOR PRESENT US 20 AND RELOCATED US 20

CONDITIONS: Estimated volumes considers the Iowa Commercial & Industrial Network and the impact of a four-lane freeway access facility.

1988 US 20 VOLUMES

1995 VOLUMES

2015 VOLUMES

% = Percent Trucks

*Volumes are identical for each alternative

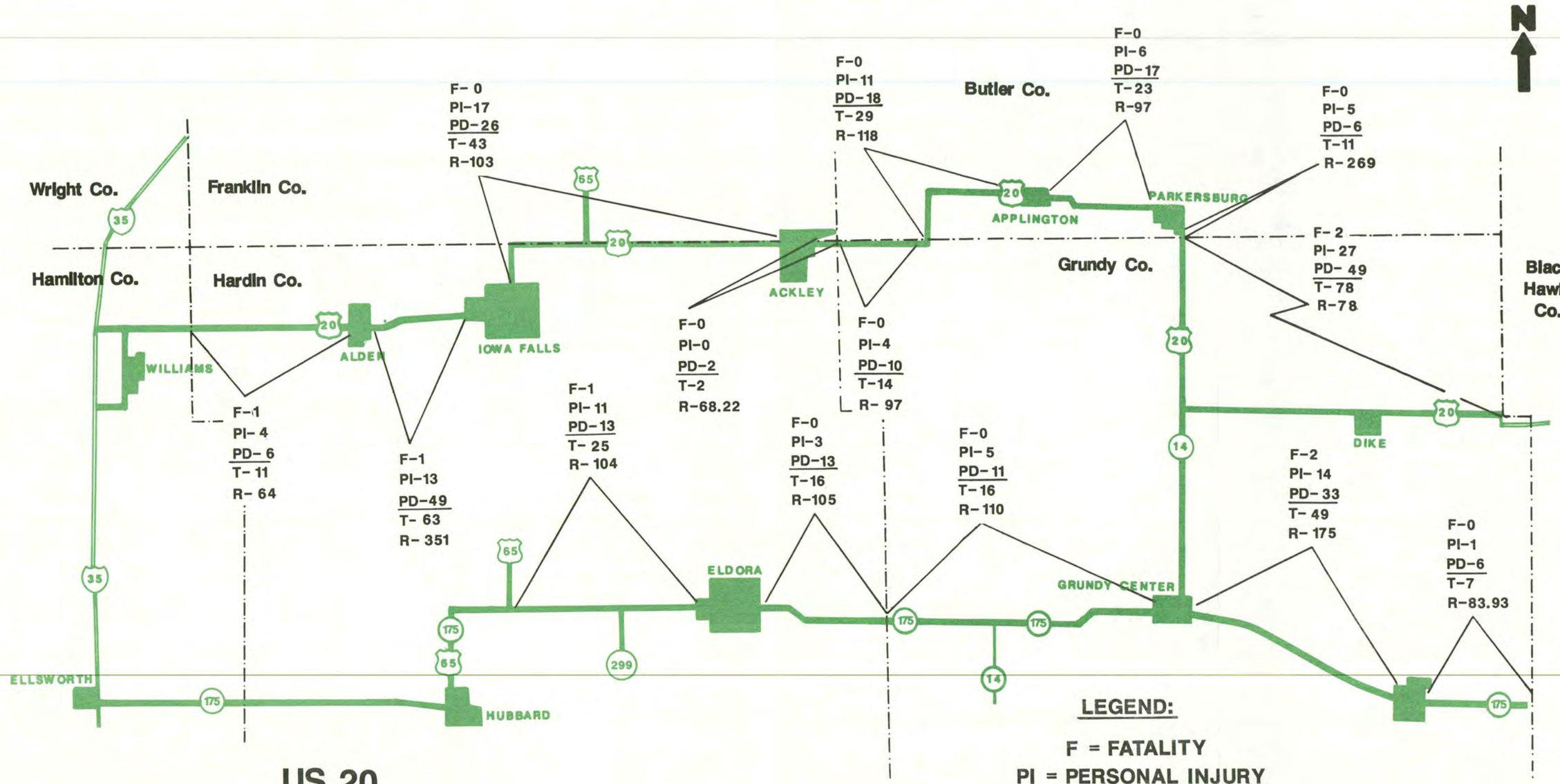
** Averaged

1995 / 2010 US 20 RESIDUAL TRAFFIC VOLUMES

Not to Scale

Locations Are Approximate

FIGURE 5



US 20
STUDY CORRIDOR
REPORTABLE ACCIDENTS
1985 – 1989

LEGEND:

F = FATALITY
PI = PERSONAL INJURY
PD = PROPERTY DAMAGE

T = TOTAL ACCIDENTS
R = ACCIDENT RATE PER 100M VEHICLE MILES

STATEWIDE ACCIDENT RATE FOR RURAL PRIMARY HIGHWAYS: 127 PER HMVM

FIGURE 6

ACCIDENT DATA FOR U.S. 20
(Urban and Rural Accidents)

Accident Totals by Type		Injuries/Accidents	
Fatal:	5	Fatalities:	6
Injury:	139	Major Injury:	36
Property:	351	Minor Injury:	139
		Probable Injury:	93
Total Accidents:	495	Total Value Loss:	$7,924,930

Summary of Purpose and Need

The proposed action is designed to meet existing and predicted surface transportation demands in the U.S. 20 study corridor by providing a modern, safe, and efficient highway facility and is necessary because of the age, condition, and outdated design of the present roadway. By locating on new alignment, traffic service and access will be improved through relocation of the new facility away from population centers which restrict free traffic flow. Additionally, the new alignment would reduce out-of-distance travel between Interstate 35 and Waterloo approximately 15 miles compared to the present route of U.S. 20. Finally, construction of this segment of relocated U.S. 20 would complete one of the final links in the larger, statewide U.S. 20 improvement. This project is intended to provide economic development support through north central Iowa by construction of a modern, high capacity facility with improved access as part of Iowa's commercial and industrial network of highways.

ALTERNATIVES

The relocation of U.S. 20 through Hardin and Grundy Counties represents the last link in the upgrading of U.S. 20 between Fort Dodge and Dubuque. The alternatives developed for this action and presented in the proposed alternatives section represent differing solutions for this linkage only to the extent that each generally was directed at addressing a specific engineering, environmental, or agricultural concern within the study corridor. And, while each alternative varies somewhat in location, costs, and overall impacts, each is similar in that a concept incorporating controlled access highway construction on new alignment is common to each proposal.

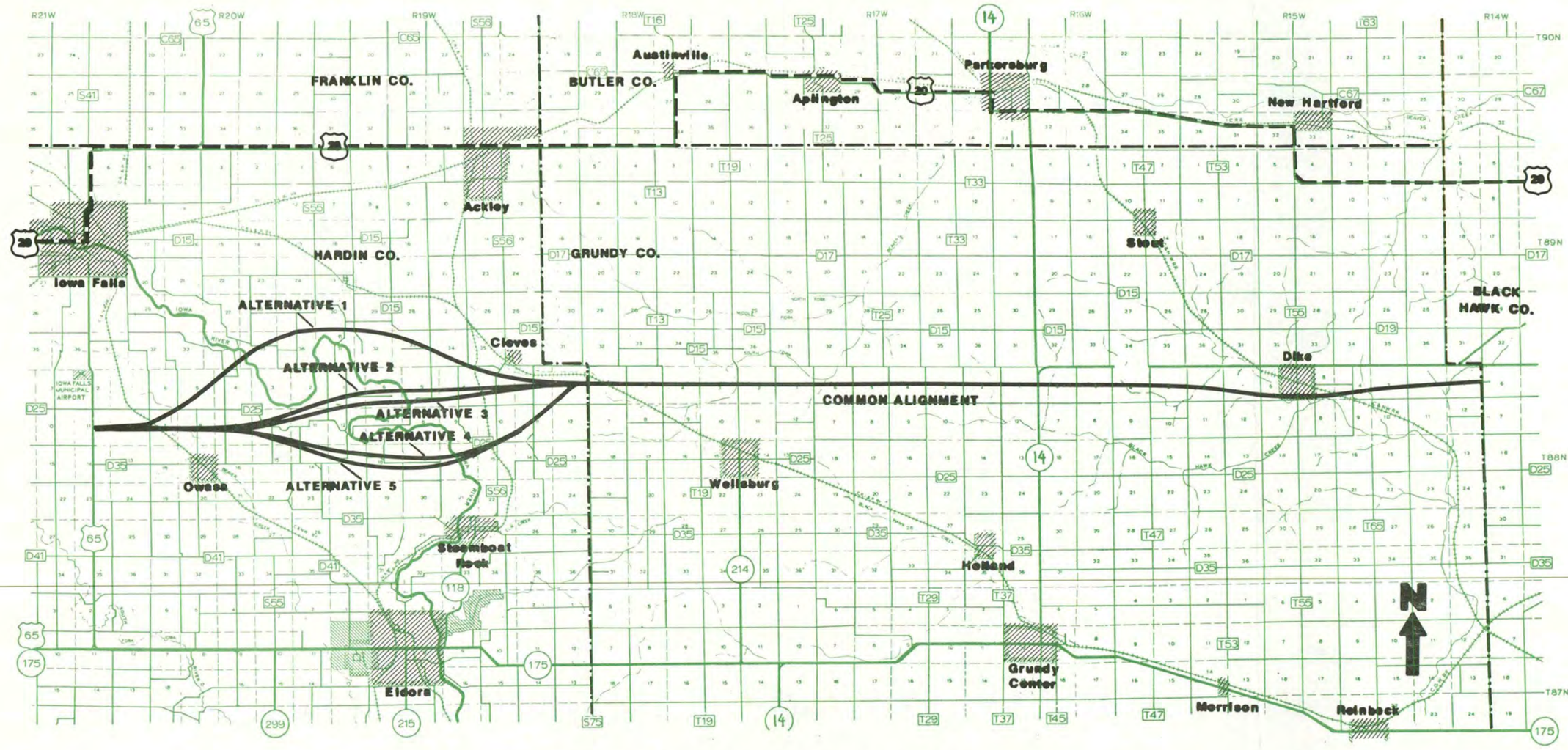
This relocation concept is consistent with all of the alternatives developed for this improvement since initial project concept development began in the mid 1960s. Many of the initial alternatives studied for the improvement were included as a result of public input during the pre-location phase of project study, or were included as potential alignments designed to avoid specific impacts as already mentioned. As a result of subsequent review and location engineering work, several of these alternatives were found to be of marginal usefulness, either because of significant unforeseen impacts, topographic problems within the corridor, out of distance travel, or because potential costs of construction would effectively remove them as viable alternatives.

Prior to selection of the proposed construction alternatives for further study, however, the entire range of 13 alignments were formalized and evaluated in a pre-location study published by the Iowa Department of Transportation in July 1987. Of these 13 alternative variations, in addition to the two common alignment alternatives, (see Figure 8) four were finally selected for additional development which are representative of and generally cover the range of concepts discussed in the original 13 pre-location study alternatives. Additionally, these represent the most feasible alignments based on engineering requirements and construction cost, road user costs, and best reconcile the need to limit project impacts with the mandate to construct a safe and efficient transportation facility.

The 1977 final EIS alternatives and 1987 pre-location study alternatives are shown in Figures 7 and 8 respectively. Proposed construction alternatives evaluated in this document are shown in Figures 9 and 10. A typical four-lane highway cross section is shown in Figure 11.

Proposed Construction Alternatives

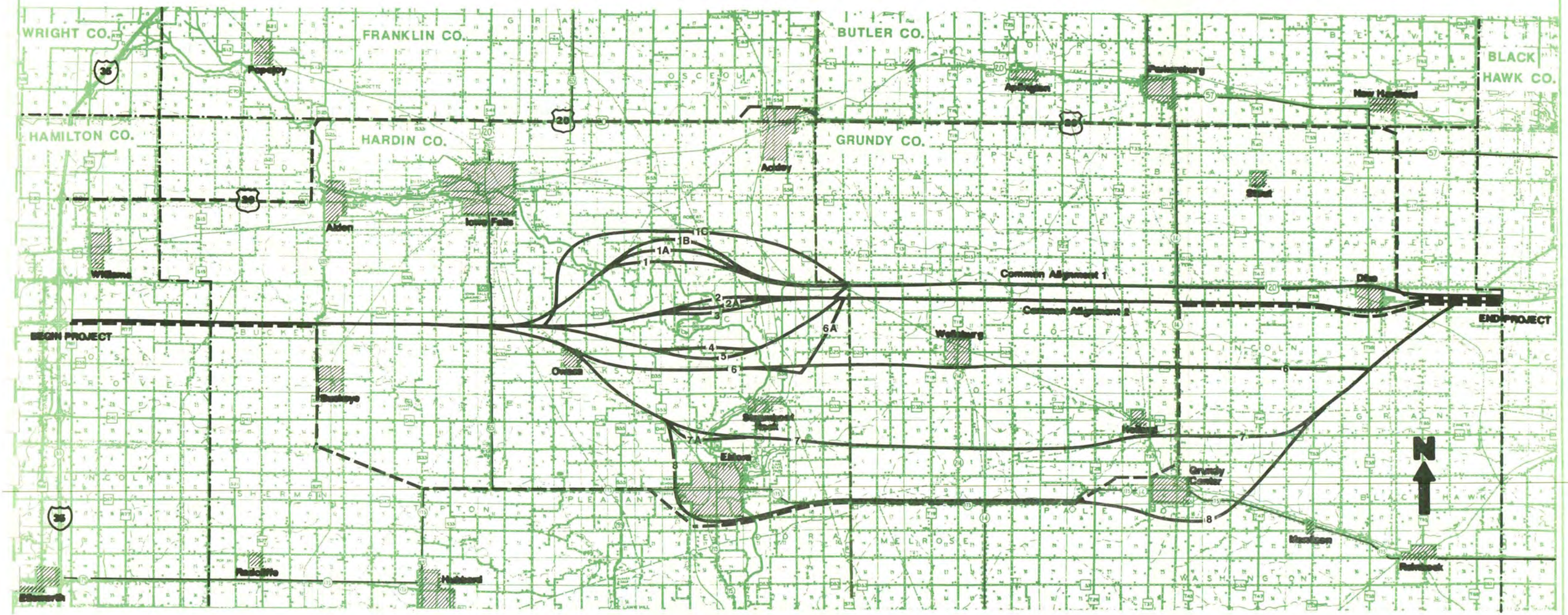
One common alignment with four variations through the greenbelt area in Hardin County have been developed for evaluation in this environmental statement. These alignments are based on those discussed in the 1987 pre-location study, which were in turn based on the alignments (four of the five 1977 FEIS alternatives are evaluated in this draft EIS) prepared for the draft and final EIS in the 1970s, and include the recommended build alternative published in the 1977 Final EIS.



1977 FINAL ENVIRONMENTAL IMPACT STATEMENT ALTERNATIVES AND ROUTE OF EXISITNG US 20

LOCATIONS ARE APPROXIMATE NOT TO SCALE

FIGURE 7



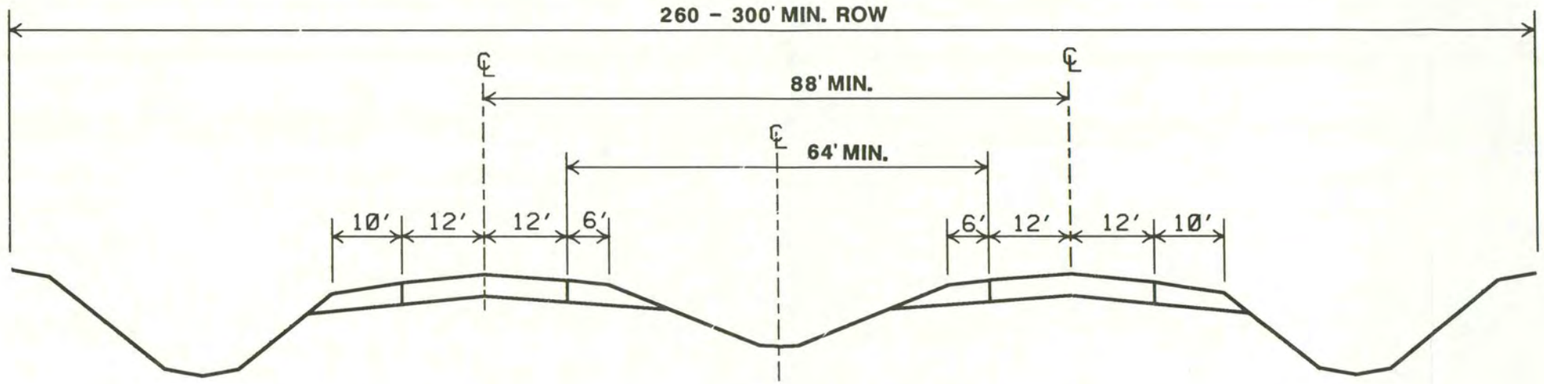
US 20 STUDY CORRIDOR

——— Restudy Alignments

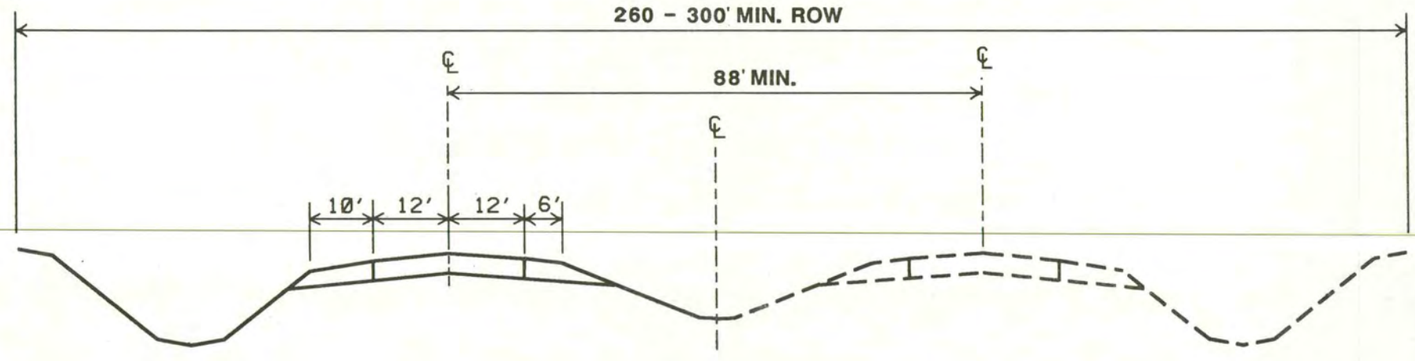
·----- Existing Alignment Alternatives

LOCATIONS
ARE APPROXIMATE
NOT TO SCALE

FIGURE 8



PROPOSED FOUR-LANE CROSS SECTION



PROPOSED INITIAL TWO-LANE CROSS SECTION ON FOUR LANE RIGHT-OF-WAY

FIGURE 11

Generally, the proposed alternatives and variations presented in this document represent new highway construction on relocated alignment and will accordingly require acquisition and conversion of new right-of-way to transportation uses. The exceptions are short segments of the greenbelt alternatives which follow existing secondary roads or former railroad right-of-way. These segments are noted in the description of each alternative.

During the earlier EIS study in the 1970s a four-lane, divided highway freeway section similar to an interstate highway was proposed for construction with each alternative. The concept prepared for the 1987 restudy modified the original proposal, and included an evaluation of a non-freeway, four-lane highway to reduce overall right-of-way needs to some extent. The freeway concept has again been adopted for the alternatives currently under study, however, initially only two new highway lanes may be constructed due to lower traffic volumes. Full access control will be incorporated into the design of the new highway.

A crossing of the Iowa River will be necessary as part of U.S. 20 relocation construction. With the exception of Alternative A, two options have been developed for this requirement, one incorporating a high bridge concept and the second following existing terrain resulting in a structure at a lower elevation. These optional bridge concepts afford the opportunity to design into the new highway avoidance measures that will reduce construction impacts such as cut and fill requirements, noise and visual intrusion impacts. Refer to the section on Visual Impacts for additional discussion and photographic examples of bridge construction options. Costs associated with bridge construction are included in Appendix 1, Selected Alternative Comparison Table.

Four-lane right-of-way and full access control will be acquired along the entire corridor as part of the initial construction plan for the new highway. This will assure that needed right-of-way for the two additional lanes is available to provide for future traffic service demand. A description of each proposed alternative is discussed as follows. Alignment length, estimated costs, and other selected values for each alternative are detailed in Appendix 1. Estimated road user cost projections are also included in this section.

Common Alignment:

The common alignment in both Hardin and Grundy Counties represents the original common alignment approved in the 1977 FEIS. In Hardin County it extends from the beginning of the project at U.S. highway 65 east approximately one and one-half miles to near the center of Section 7 in Jackson Township.

In Grundy County the common alignment generally traverses a corridor one-half mile south of existing U.S. 20 to a point near Iowa 14, a distance of approximately 12 miles. From there it proceeds west on the half section line about 6.5 miles south of the present U.S. 20 alignment for approximately 11 miles to near the Hardin/Grundy County line where the greenbelt alternatives begin. This location will place the common alignment through the center sections of agricultural land for the greater part of its length. Such a location has the

benefit of improved access control compared to construction on existing U.S. 20 alignment, where access points are established and commercial and residential development is underway.

Potential grade separations and interchange locations are shown in Figures 9 and 10. Actual grade separation locations and interchange locations will be determined in consultation with local communities after selection of a preferred alternative. Proposed interchanges and separations are similar to those shown in the 1977 FEIS, but with some modifications in location due to changes in alternative alignments. Additionally, during the early coordination/scoping process for relocated U.S. 20, city officials and community leaders in Iowa Falls and Eldora expressed the desire for an added interchange near the western end of each alternative to improve access to these communities. This possibility will be evaluated as project development continues, but any interchange additions will be contingent upon establishing that traffic demand warrants the additional construction expense.

Alternatives A-D

The four construction variations through the Hardin County greenbelt area were located to present a range of options, each with a varying effect on the greenbelt and each representing a feasible engineering solution for extending a transportation facility through this area. As discussed earlier, these alternatives generally follow the alignments of the original FEIS alternatives, with modifications to reduce right-of-way requirements or impacts to areas of the Iowa River valley or farmland. This included using existing or paralleling local road corridors, former railroad alignments and locating alignments on section or half-section lines to minimize disruptions to farm operations. Additionally, in some cases curvi-linear alignments were used to avoid higher quality natural areas and habitat. Alternative variations A through D are shown in Figure 9.

Alternative A

This alternative is the northernmost alignment and begins in Section 7 of Jackson Township where it leaves the western segment of common alignment. At this point the Alternative A corridor is located on a northerly line through Section 33 of Hardin Township before turning east for a distance of about seven miles, to Section 27 of Etna Township. This alternative crosses the Iowa River just northwest of Crosses Ford in Section 34 of Hardin Township. In Section 27 of Etna Township the alignment follows the former route of the Chicago and North Western Railroad line to a point north of Cleves before turning east through Section 36 of Etna Township and Section 31 of German Township. Alternative A then ties in with the Grundy County portion of common alignment in Section 6 of Shiloh Township.

Alternative A Alignment Variation:

An alignment variation of Alternative A has been developed to reduce right-of-way impacts to farmland in the vicinity of Cleves in the northeastern part of Hardin County. This variation is shown in Figure 9 and aerial photographic plates 10 and 11. This optional alignment generally follows a line paralleling the former Chicago, Rock Island the Pacific rail corridor from northwest of Cleves south and east before tying in to the relocated U.S. 20 common alignment in Section 6 of Shiloh Township in Grundy County.

Although this option has the value of reducing right-of-way impacts to farming operations adjacent to the original Alternative A corridor, it presents several less desirable features which affect its feasibility as a viable construction option. For example, the variation concept would require two additional crossings of Beaver Creek, resulting in the need to construct four additional bridges. Also, an approximately 1,400 foot channelization of Beaver Creek would be required to provide clearance for new highway construction. A tie-in with County Road S56 would require construction of a fifth additional bridge, plus require approximately 2,000 feet of county road re-construction to effect acceptable U.S. 20 crossing geometrics. Construction along the rail corridor could also result in disturbances to prairie lands which are located along the former railroad right-of-way. Finally, this optional alignment would add approximately $1.6 million of additional costs for construction of Alternative A.

Alternative B

The Alternative B alignment leaves the western segment of common alignment in Section 7 of Jackson Township and proceeds easterly to a point in Section 11. At this location the alignment proceeds northeasterly and then easterly into Section 6 of Clay Township. The alignment crosses the Iowa River in Section 5, then follows a curvi-linear corridor easterly approximately five and one-half miles before joining the Grundy County portion of common alignment in Section 6 of Shiloh Township. Use of the curving alignment through the greenbelt area would avoid or limit highway encroachment on higher quality woodlands and ecologically important habitat, as well as a number of cultural sites located near this corridor. Alternative B generally follows the alignment of the preferred alternative identified in the 1977 final environmental impact statement. However, as previously discussed, the alignment has been made more curvilinear to reduce potential impacts to sensitive areas identified in the biological surveys conducted for the project.

Alternative C

Alternative C leaves the western common alignment in Section 7 of Jackson Township following a southeasterly line along the former Chicago and North Western railway corridor north of Owasa in Section 17 of Jackson Township. At this point the alignment progresses easterly approximately seven miles to Section 16 of Clay Township. Through Sections 17 and 16 of Clay Township the Alternative C alignment makes a southerly curve to avoid higher quality woodlands

and habitat. From there the alignment proceeds on a diagonal line northeast, crossing the Iowa River in Section 16 and proceeding to Section 2 in Clay Township. Continuing on, the alignment proceeds easterly on the half-section line for a distance of about two miles before joining the Grundy County common alignment.

Alternative D

This option also departs from the western common alignment in Section 7 of Jackson Township, and proceeds on a southeasterly line on the former Chicago and North Western rail corridor to a point north of Owasa. At that location the line curves easterly adjacent to the community of Owasa before turning east on the section line in Section 16 of Jackson Township. The corridor then extends approximately six miles on the section line to Section 17 of Clay Township, where it turns northeasterly, tying in to the Alternative C alignment in Section 16 of Clay Township. From that point both Alternatives C and D share a common alignment to the tie-in with the Grundy County common alignment.

Alternative C/D Iowa River Crossing Variation

This optional crossing alignment is located approximately 500 feet downstream from the proposed C/D crossing site and has been developed to avoid less desirable aspects of the original alignment. See Figure 9 and aerial photographic plate 5. As proposed, the C/D crossing location would place the new Iowa River bridge crossing near a bend of the river, which may require river bank bank stabilization in order to protect bridge piers from stream erosion. Also, the proposed C/D alignment approaching the crossing site west of the river passes through a higher quality wooded area where some unique vegetation species may be located (e.g. paper birch) and an eagle roosting site is located. Additionally, this alignment would require the relocation of an active farmstead.

In moving the crossing site downstream, a more favorable Iowa River Crossing could be achieved that would not require bank stabilization, would have somewhat less impact on natural areas, and would not require any additional relocations. Costs for construction would be comparable for both crossing alignment proposals. The optional line would however, traverse the northern tip of the Sand Springs Recreation Area, parkland owned by the Iowa Department of Natural Resources and included as part of the Hardin County greenbelt. Based on preliminary location planning, up to 2.5 acres would be required from this 216 acre park. Also, the north park access road would be bisected by highway construction. Detailed discussion of the park and potential project impacts is included in the draft Section 4(f) evaluation included as Appendix 3 of this document.

No-Action Alternative

The no-action alternative is also under consideration as an option for this improvement. With this option no relocation would take place within the study corridor. Instead, any improvement within the study corridor would be minimal

and limited to short-term restoration improvements that would maintain continuing operation of the existing U.S. 20 highway corridor.

Benefits of this alternative would be in avoiding the direct costs of constructing a new highway on relocated alignment, reduction of social and economic impacts generated by construction on new alignment as well as avoiding the diversion of agricultural lands to transportation uses. Also, by maintaining the existing roadway, the need to acquire or encroach upon any of the natural areas in or near the Hardin County greenbelt would also be avoided.

Disadvantages of this option would be in not providing a direct connection with the existing segments of relocated U.S. 20. This would reduce the inherent economic advantages associated with the location and design of this facility and limit the effectiveness of U.S. 20 as a safe and efficient transportation facility across Iowa. Additionally, by taking no long-term action to upgrade the capacity of the present two-lane roadway, safety and convenience problems would continue to increase as traffic volumes reach projected levels.

OTHER ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

Existing Alignments

Two existing alignment options using either a modified alignment of present U.S. 20 or Iowa 175 were studied for this improvement. Both alignments are shown in Figure 8.

The existing U.S. 20 alignment as modified for this study changed the overall mileage from the present 55 miles to approximately 59 miles. It would also relocate the U.S. 20 corridor out of the communities of Parkersburg, Applington, Ackley, and Iowa Falls. Although this alternative would have resulted in some relocation of the present U.S. 20 alignment, nearly all would have been on existing primary or secondary roadway corridors, thus avoiding introduction of a new highway corridor where none previously existed.

The existing Iowa 175 proposal was similar to the existing U.S. 20 alignment in that it also would have used a combination of existing primary and secondary roadways to relocate U.S. 20. Some new construction on new alignment (approximately 10+ miles) was planned with this alternative to avoid the communities of Grundy Center and Eldora.

The most obvious benefits of using an existing highway alignment wherever possible was the potential to limit right-of-way needs and associated impacts within the study corridor. Along with this was the added benefit of limiting the intrusion of a new highway corridor onto new alignment.

Upon further study it was found that overall right-of-way needs would not be reduced using these alignments because of the longer distances involved with the present U.S. 20 - Iowa 175 roadways (representing significant out of distance travel). Also, relocation costs and impacts associated with these alternatives would be much greater compared to a relocation alignment because of existing development within the U.S. 20 - Iowa 175 corridors. Moreover, when cost comparisons were made it was found that both existing alignment options would cost about 25-32 million dollars more (see alternative comparison table below) than the cost of constructing on new alignment. For these reasons, both existing alignment alternatives were not considered practicable options and were dropped from further study.

TABLE 2
EXISTING ALIGNMENT
ALTERNATIVE COMPARISON

Alternative	Total Length	Total ROW Acres	Estimated Displacements	Diagonal Severance Mileage	Estimated Construction Costs in 1,000s
New Alignment (Averaged)	39.0	1,391	3	5	$ 76,000*
Existing U.S. 20	59.5	1,552	59	4	$103,000*
Existing Iowa 175	69.5	1,904	32	10	$105,000*

*Estimates updated to reflect current costs.

Note that data in the above table is based on information prepared for the 1987 pre-location study and may not reflect subsequent alignment modifications.

Transportation System Management/Mass Transit

The transportation system management and mass transit alternatives are not viable options in a low population rural environment and were not evaluated as part of this study.

AFFECTED ENVIRONMENT

Environmental Setting

The study corridor is located in Hardin and Grundy Counties in north central Iowa, and adjacent to the Waterloo-Cedar Falls metropolitan area, (located just east of the corridor in Black Hawk County) one of Iowa's largest population and industrial centers. The study corridor itself is characterized as a rural agricultural zone punctuated by small farming communities. The largest of these, Iowa Falls, with a population of 5,870, is located in north central Hardin County. Grundy Center, population 2,700, and county seat of Grundy County, is located in central Grundy County. Several smaller communities near the study corridor would also be indirectly affected by relocating U.S. 20 and are shown in Figure 12. The largest of these is Eldora, population 2,930 and county seat of Hardin County.

Social and Economic Setting

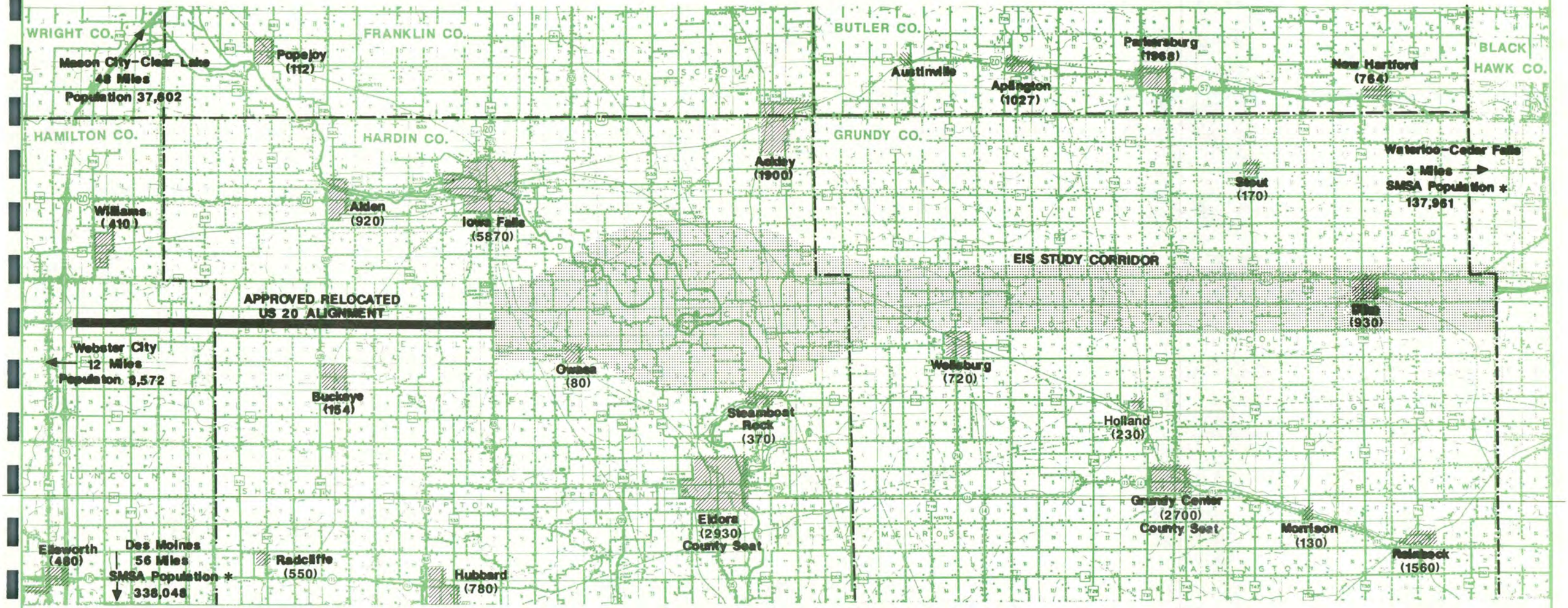
Based on 1980 census data, Hardin County contains 574 square miles while Grundy County is listed as containing 501 square miles. Demographic breakdowns for these counties are shown in Table 3 below.

TABLE 3

DEMOGRAPHIC VALUES FOR THE U.S. 20 STUDY CORRIDOR

	Hardin Co.	Grundy Co.
Population		
1986	20,800	13,200
1980	21,776	14,366
1970	22,248	14,119
Population Characteristics		
Female	51%	51%
Census Count:		
Black	1	60
Hispanic	35	84
Amerindian	4	26

As shown above, the general population affected by the proposed action is predominantly white and anglo-saxon in origin. Because the proposed action is located in a rural portion of the state, there would be no neighborhoods or elderly, minority, ethnic or religious concentrations that would be impacted by construction activities.



* SMSA :

Standard Metropolitan Statistical Areas

1986 Data

STUDY AREA
POPULATION CENTERS

N

LOCATION AND DISTANCES
ARE APPROXIMATE
NOT TO SCALE

FIGURE 12

The principal industry in both Hardin and Grundy Counties is agriculture, with grain and livestock production predominating. In 1986, farms in Grundy County occupied 97 percent of total land, with harvested cropland equaling 90 percent of all land in farms. Primary crops include corn, soybeans, and hay. In Hardin County in 1986 farms occupied 95 percent of total land with harvested cropland equaling 84 percent of all land in farms. Primary crops include corn, soybeans, and hay. In both counties livestock production centers on hogs and cattle.

Average farm size in Grundy County in 1986 was 292 acres. In Hardin County this figure was 305 acres. This compares with a statewide average of approximately 320 acres. Out of 99 counties in the state, Grundy County ranked 26th in agricultural receipts with Hardin County ranked 20th in 1986.

The total number of business establishments in Grundy County was 349 in 1986. In Hardin County this figure was 670. Retail trade decreased in both counties during fiscal year 1986 compared to the previous year. The Iowa Directory of Manufacturers listed 22 entries for Iowa Falls and 15 and 10 respectively for Eldora and Grundy Center. The majority of these (25) are small local concerns employing less than 20 persons. Twelve firms were listed as employing 21-50, with six firms in the 51-100 range, and four firms listed as employing between 101 and 250 persons.

Employment breakdowns by type of industry are shown in Table 4 below.

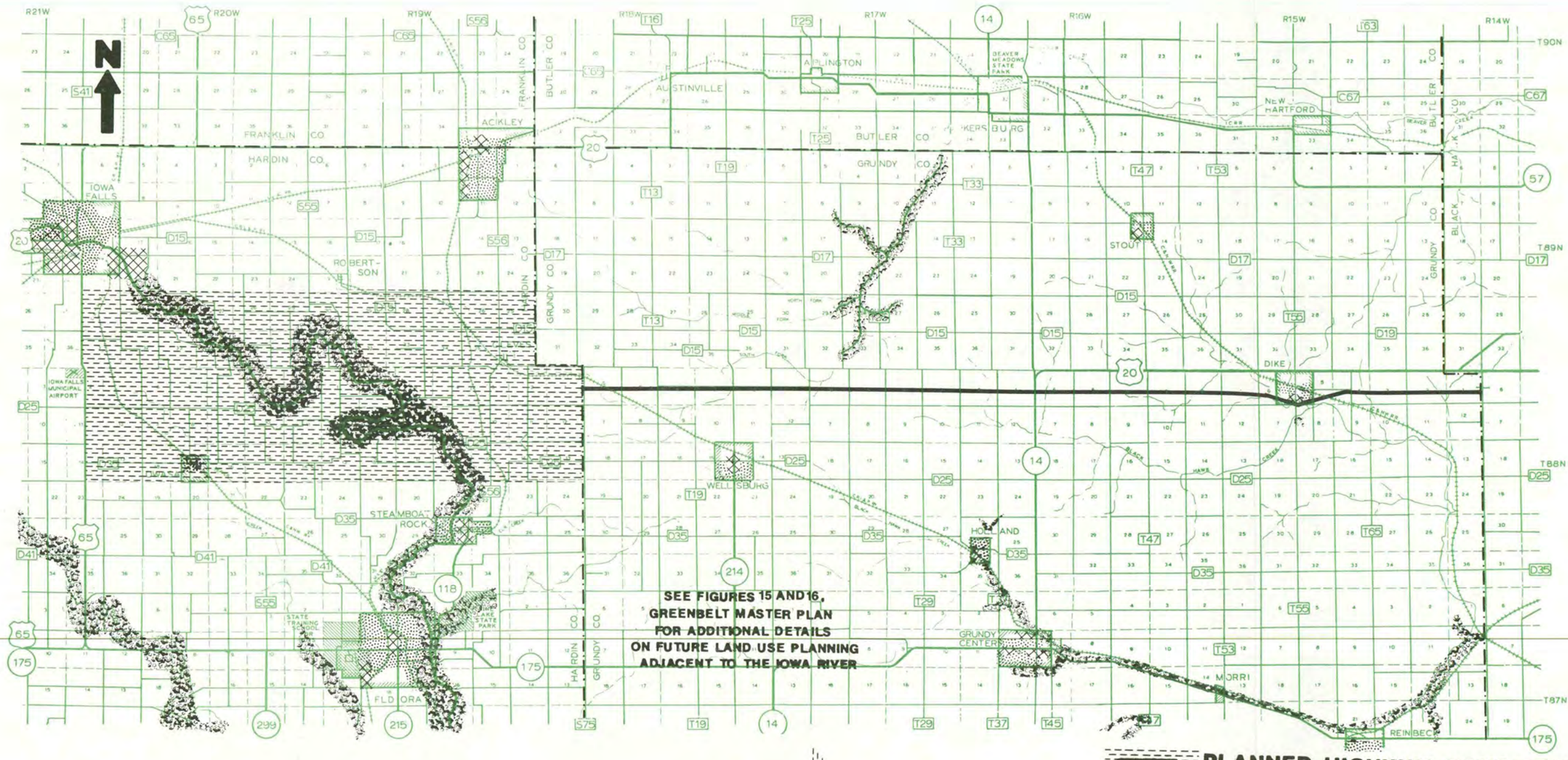
TABLE 4

EMPLOYMENT BY INDUSTRY
(1983 Data)

	Hardin Co.	Grundy Co.
Professional or Related Services	19%	17%
Manufacturing	17%	25%
Wholesale/Retail Trade	25%	19%
Agriculture, Forestry, Fisheries, Mining	16%	21%
Self Employed	18%	22%
Employed in Other Counties	11%	34%

As established earlier, land use in the corridor is dominated by agriculture and related uses. The most notable exceptions are the Hardin County greenbelt and the several small communities where residential and commercial utilization is evident. Both counties are zoned, with agricultural classifications dominating. Again, the exceptions are in and near the major communities and the Hardin County greenbelt where park and open spaces classifications are found. Both counties are associated with areawide planning agencies (Region Six Planning Commission for Hardin County and Iowa Northland Regional Council of Governments for Grundy County). Both planning organizations have prepared comprehensive plans to meet future development needs, which include regional transportation needs. Area comprehensive plans are shown in Figure 13. The proposed relocation of U.S. 20 is consistent with these plans.

The basis for this section is the 1988 edition of Iowa Facts, published by Clements Research Inc., Dallas, Texas. Additional supporting information was derived from the U.S. Census Bureau. Unless otherwise noted, all figures are based on 1986 data. Some population figures are estimated.



FUTURE LAND USE PLANNING AND MASTER ROAD PLANS FOR HARDIN AND GRUNDY COUNTIES

LOCATIONS ARE APPROXIMATE

PLANNED HIGHWAY CONSTRUCTION

- AGRICULTURAL
- RESIDENTIAL
- COMMERCIAL/INDUSTRIAL
- OPEN SPACE, PARK OR WOODLAND

FIGURE 13

Parks and Recreational Areas

Both Hardin and Grundy Counties contain a number of parks and recreational areas typical of those found throughout Iowa. There are a total of 42 county and 42 municipal parks and recreational areas listed in Hardin County totaling approximately 1,971 acres, with 10 county and 15 municipal parks and recreational areas listed for Grundy County totaling about 443 acres. County conservation boards have been established in both counties to oversee use and development of these facilities.

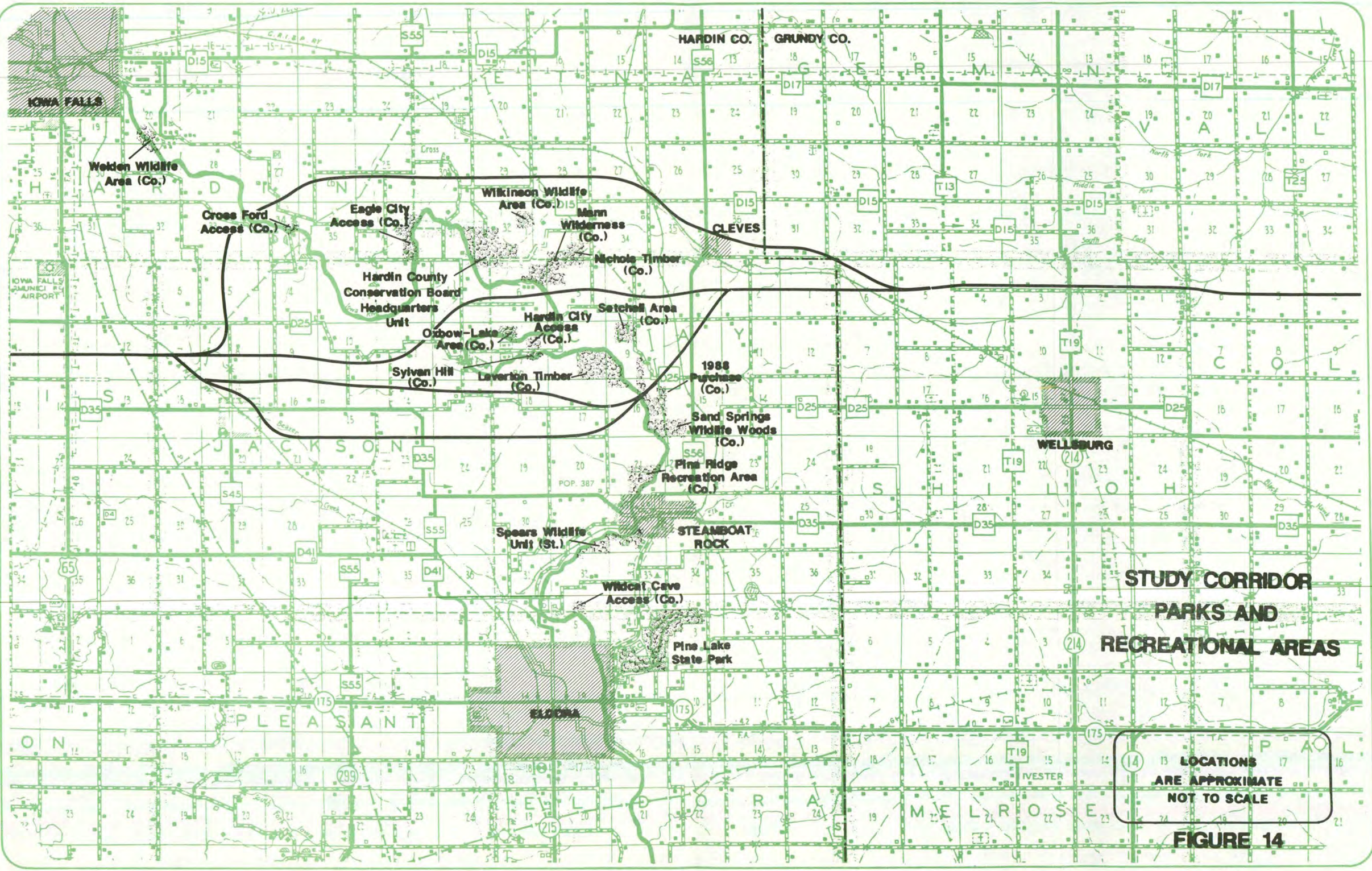
Project construction will have no effect on parks and recreational areas in Grundy County, with the possible exception of providing improved access to those facilities located near the corridor. In Hardin County the corridor will traverse the Hardin County greenbelt, a system of state and county owned parks and recreational areas, interspersed with privately-owned areas, located along the Iowa River between Iowa Falls and Eldora.

The Iowa River greenbelt is the most noteworthy natural feature in the project corridor and consists of upland wooded areas, open prairie lands, wetlands and herbaceous areas adjacent to the Iowa River. Over the years, this area has come to be known as the Iowa River greenbelt, although only a limited portion is owned by the state or county and dedicated exclusively to conservation uses. The majority of land is in private ownership, with agricultural uses dominating but with a number of small acreages also evident. The greenbelt area along with the other parks and recreational areas in or near the study corridor are shown in Figure 14.

The publicly owned portion of the greenbelt is composed of a number of wooded parcels and open areas totaling more than 1,000 acres, which have been purchased for public use and protection. These parcels are either owned or managed by the Hardin County Conservation Board which, in cooperation with the State Department of Natural Resources and local environmental groups, intends to continue to purchase tracts adjacent to the river for public recreational use and preservation.

A recent development in the greenbelt has been the completion of a master plan which includes both state and county lands as well as privately owned land paralleling the Iowa River. This document was published in 1988 by the Iowa Natural Heritage Foundation, an independent, non-profit environmental organization, in cooperation with area governments and interested businesses and citizens. This development plan is shown in Figures 15 and 16.

In general, the master plan divided the Iowa River valley by delineating a proposed boundary with environmental buffer zones and the greenbelt corridor itself, which encompasses the significant resource base of the greenbelt. The master plan is intended to serve as a guide to enhance greenbelt use and development for both public and private benefit by providing a plan for long-term management.

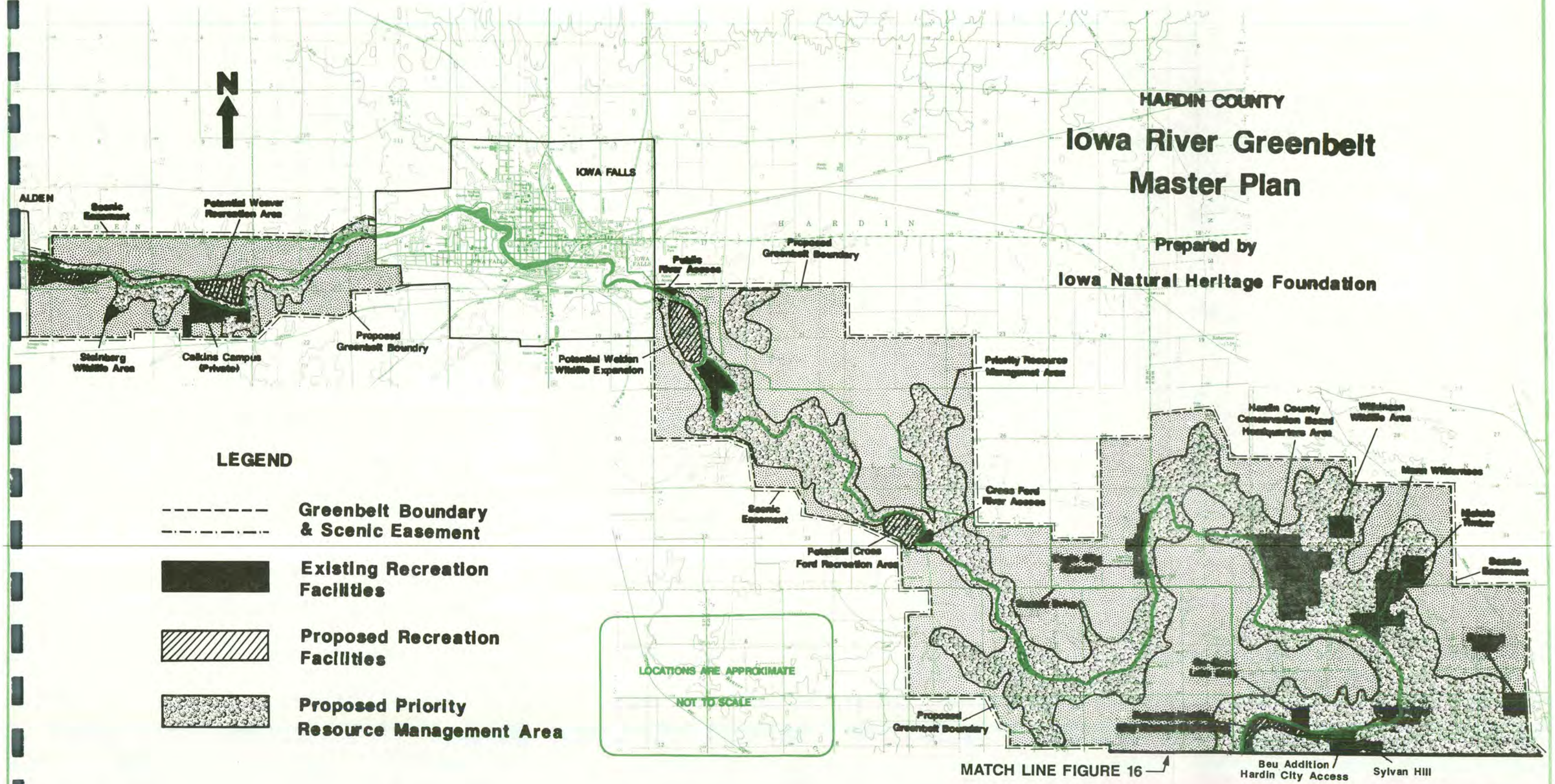

IOWA FALLS
HARDIN CO.
GRUNDY CO.
Welden Wildlife Area (Co.)
Cross Ford Access (Co.)
Eagle City Access (Co.)
Wilkinson Wildlife Area (Co.)
Mann Wilderness (Co.)
CLEVES
Nichols Timber (Co.)
Hardin County Conservation Board Headquarters Unit
Setchell Area (Co.)
Hardin City Access (Co.)
Oxbow-Lake Area (Co.)
Sylvan Hill (Co.)
Leverton Timber (Co.)
1988 Purchase (Co.)
Sand Springs Wildlife Woods (Co.)
Pine Ridge Recreation Area (Co.)
WELLSBURG
POP. 387
Spears Wildlife Unit (St.)
STEAMBOAT ROCK
Wildcat Cave Access (Co.)
Pine Lake State Park
ELDORA
IVESTER
MELROSE
STUDY CORRIDOR
PARKS AND
RECREATIONAL AREAS
LOCATIONS
ARE APPROXIMATE
NOT TO SCALE
FIGURE 14

HARDIN COUNTY

Iowa River Greenbelt Master Plan

Prepared by

Iowa Natural Heritage Foundation



LEGEND

- Greenbelt Boundary & Scenic Easement
- Existing Recreation Facilities
- Proposed Recreation Facilities
- Proposed Priority Resource Management Area

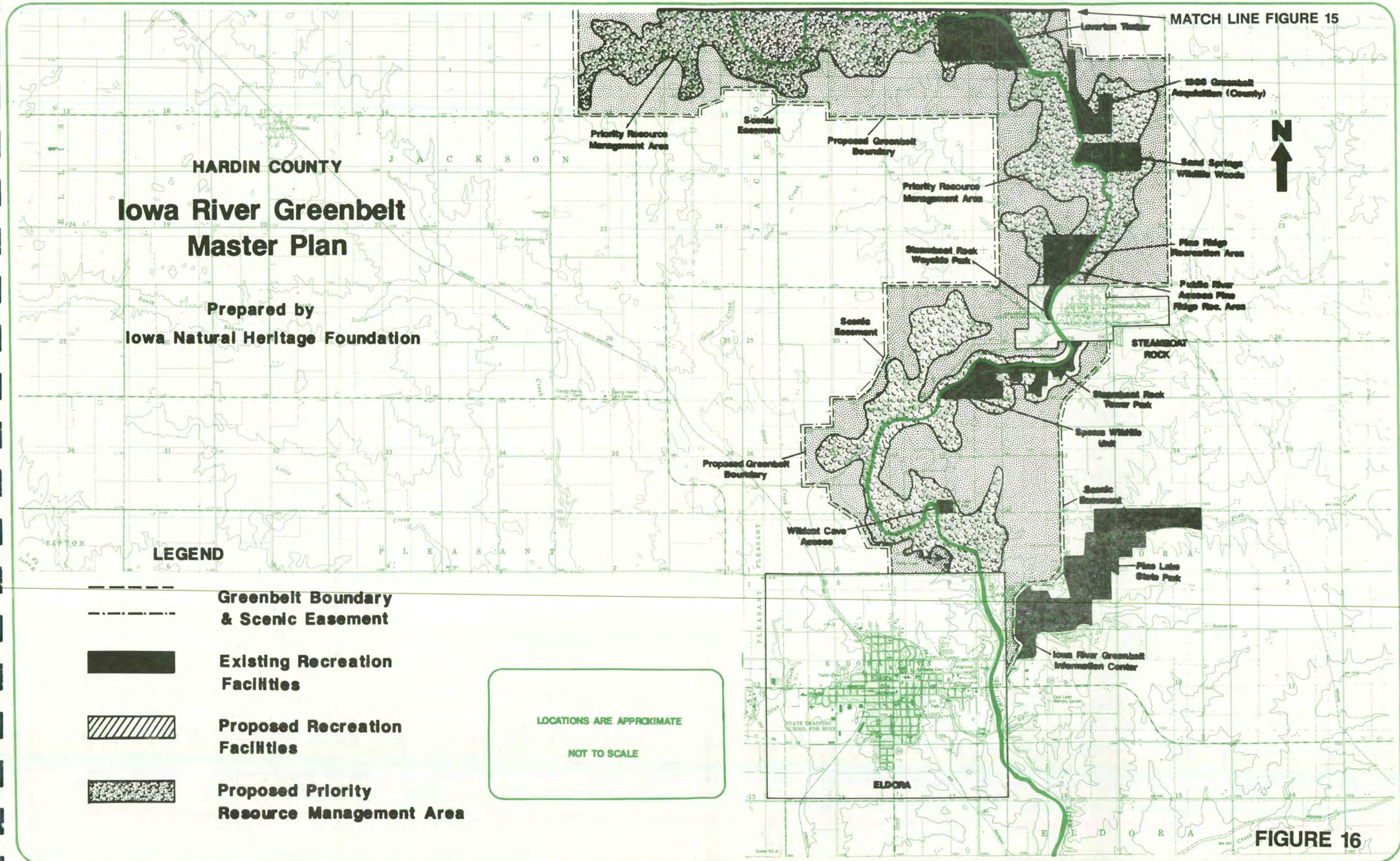
FIGURE 15

HARDIN COUNTY

Iowa River Greenbelt Master Plan

Prepared by

Iowa Natural Heritage Foundation



LEGEND

- Greenbelt Boundary & Scenic Easement
- Existing Recreation Facilities
- Proposed Recreation Facilities
- Proposed Priority Resource Management Area

LOCATIONS ARE APPROXIMATE

NOT TO SCALE

FIGURE 16

Although project construction will encroach upon the greenbelt as delineated in the master plan, only the optional Alternative C/D alignment variation would actually require conversion of parkland to transportation uses. This alignment will traverse a parcel located at the north edge of the Sand Springs Wildlife Woods, in Section 16 of Clay Township. This parcel is owned by the Iowa Department of Natural Resources but administered by the Hardin County Conservation Board as part of the Sand Springs Unit of the greenbelt. Based on preliminary design, the optional Alternative C and D alignment would traverse the northernmost segment of the park, eliminating an existing one-lane dirt access road. Additional discussion of project impacts to this parcel as well as proposed mitigation is contained in the Preliminary Section 4(f) Section of this document. The proposed alignment of each construction alternative through the greenbelt area is shown in Figure 17.

The proposed Alternative C alignment will also traverse a one-lane, dirt access road to Leverton Timber, located in Section 17 of Clay Township but would not require conversion of any parkland. New access will be provided as part of project construction if this alternative is selected, and no adverse impact is expected due to project construction. Similarly, the proposed C/D crossing of the Iowa River will bisect the north access road to the Sand Springs Wildlife Area. Again however, equivalent access will be provided (if either Alternative C or D is selected as the construction alternative) as part of project construction activities, and no adverse impacts are expected to the park.

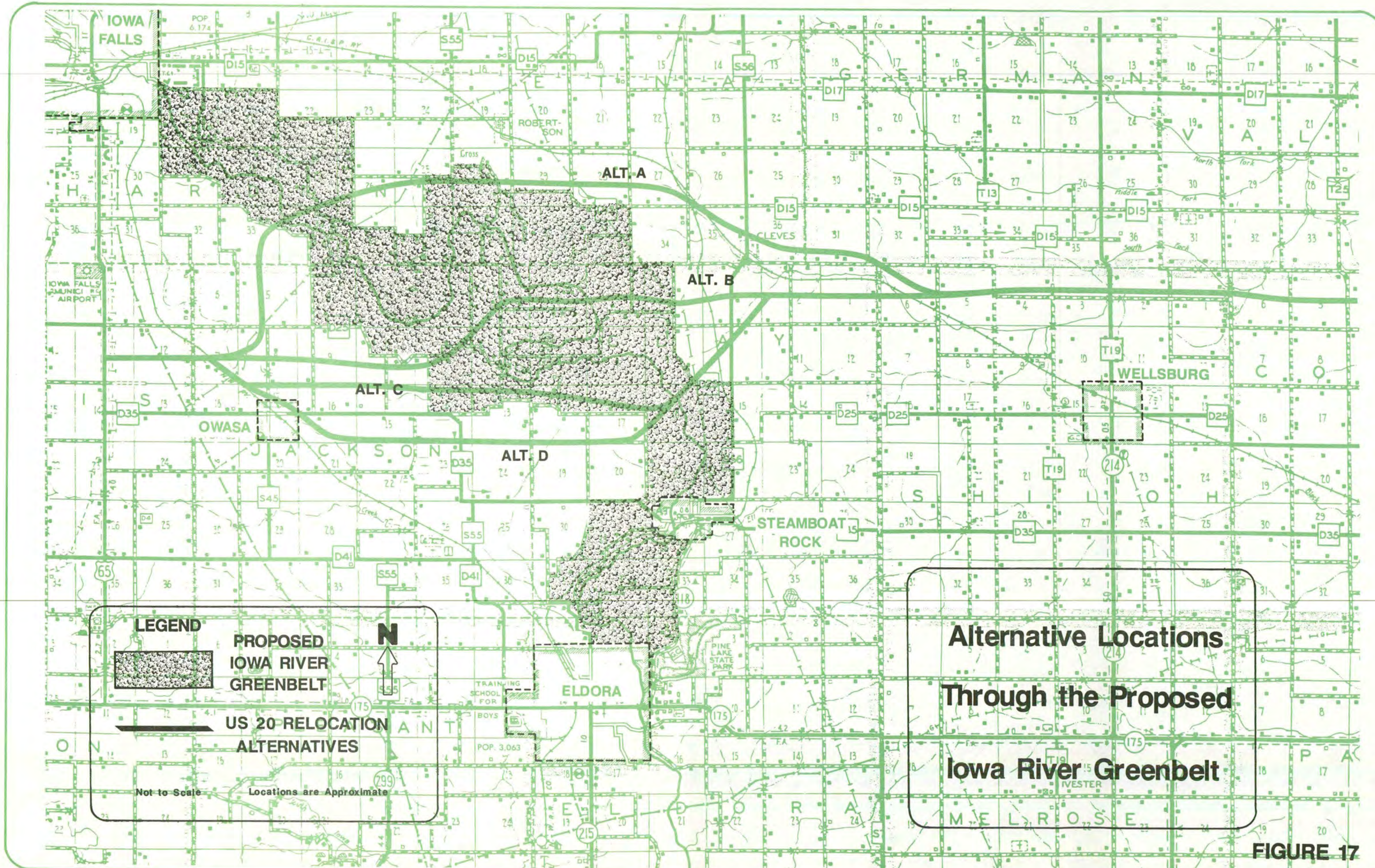

IOWA FALLS
POP 6,174
ROBERTSON
ALT. A
ALT. B
ALT. C
ALT. D
CLEVES
WELLSBURG
OWASA
JACKSON
STEAMBOAT ROCK
ELDORA
POP. 3,063
PINE LAKE STATE PARK
TRAINING SCHOOL FOR BOYS
IOWA FALLS MUNICIPAL AIRPORT
IVESTER
MELROSE
LEGEND
PROPOSED IOWA RIVER GREENBELT
US 20 RELOCATION ALTERNATIVES
N
Not to Scale
Locations are Approximate
Alternative Locations Through the Proposed Iowa River Greenbelt

FIGURE 17

10. Impact evaluation and comparison of alternatives.

11. Recommendations for avoidance and mitigation, and monitory recommendations.

Because of the magnitude and complexity of this technical study, it will not be included with the distribution of either the draft or final EIS. Rather, information provided in the report, including technical and supporting data and summary information will be used to establish existing conditions and to define specific impacts that are included in the EIS. Accordingly, the BRD study will be incorporated by reference into the larger EIS, with the Iowa Department of Transportation taking full responsibility for the accuracy, scope and content of the study.

In addition to the BRD report, project studies also included a significant time investment on field studies and research conducted by the various resource specialists at the Iowa Department of Transportation. This work was closely coordinated with local governmental jurisdictions and appropriate federal agencies, and included consultations with national, state and local environmental organizations, businesses and farming interests. Also, in many instances interested individuals and residents of the corridor were contacted in order to obtain varying perspectives and up-to-date data on potential project impacts within the area of study.

Summary of Existing Conditions and Historical Perspective

Within the approximately 40-mile long corridor under study for this improvement, the 27+ mile segment in Grundy County and eastern Hardin County, extending from existing relocated U.S. 20 in Black Hawk County west to near the Iowa River, is under intensive, annual agricultural use and presents only a minimal amount of undisturbed natural areas. This is also true of that segment of the corridor extending from west of the Hardin County greenbelt west to the beginning of the project at U.S. Highway 65, a distance of approximately 4.5 miles.

The remaining natural areas in each of the study corridors are concentrated in the Iowa River valley, although even here only a very small percentage was found to be in original, undisturbed condition.[1] However, the forests of the greenbelt, although considerably diminished, remain a significant feature of the landscape. Logging activity has declined, and if timber grazing is not too extensive, the forests may recover, as is happening in the areas that have been protected through public acquisition.

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[1]L. H. Pammel, 1900. The Forest Flora of Hardin County: Iowa Geological Survey Annual Report. In this document, Pammel reported the Iowa River forest had been injured and suggested reasons for this decline included heavy timber cutting for railroad ties, death due to the unseasonable winter of 1898-99, and over grazing. He also indicated that much marketable timber was being cut for lumber and fuel.

Physiographic features of the gorge which forms the Iowa River basin between the communities of Iowa Falls and Eldora provided for the development of forests and created an unusual habitat for forest vegetation in the vicinity of the Iowa River that is more like areas of extreme northeastern Iowa. Several plant species identified within the greenbelt are more akin to this more northerly region (such as white pine, white birch, yellow birch, and trailing juniper) which further contributes to the quality of this area.

A combination of geologic events are responsible for this uniqueness and these events have left a variety of distinct topographic features and landforms. For example, the limestone and dolomite outcroppings near Eagle City and Iowa Falls were formed during the Mississippian age, approximately 300 million years ago, when this region was submerged under tropical salt-water oceans. The high sandstone bluffs in the vicinity of Eldora were formed during the Pennsylvanian age, approximately 250 million years ago, when they were part of a large coastal estuary (Anderson, 1982).

However, most of the ancient bedrock layers are buried beneath the deposits from three major glaciations over the past two million years. This glaciation has also left distinct signatures on Hardin County, including three major landforms. These included two Kansan deposits on the eastern edge of Hardin County, the loess-capped drift of the Southern Iowa Drift Plain in the southeastern corner of the county, and the Iowan Erosional Surface in the northern corner. The remainder of the county consists of variable hills, ridges, knobes and kettle-holes characteristic of the morainial topography of the Wisconsin drift sheet, the last lobe of glacial ice to advance into Iowa (the Des Moines lobe), (Prior, 1976 and 1985).

With the arrival of settlers in Hardin County the forested areas along streams were settled first because of their similarity to the eastern United States. Along the wooded sections of the Iowa River, settlements such as Alden, Hardin City, and Steamboat Rock were established even before the arrival of the railroads. These locations offered a source of wood for fuel and building materials, accessibility to water for drinking and transportation, and protection from blizzards and prairie fires.

Although much of the forests of Hardin County have been removed and all have been logged and grazed at different times, large forested tracts still remain along the Iowa River in the project area. Some of these have been protected through public acquisition, such as the Mann Wilderness and Leverton Timber.

Occupation of the prairie occurred as the richness of the soil became apparent. The number of settlers increased as tools were developed to break through the tough prairie sod. Thereafter, the prairie was rapidly converted to cropland. This conversion took place in a period of less than 50 years. The last areas to go were the wet, upland sloughs and sedge meadows which finally yielded to improved tiling technology. This conversion to cropland was very thorough, with few remnant prairies or wetlands remaining within the area of study. Today, the principal remaining prairie remnant in the county is the Leverton Prairie which

was maintained as a source of prairie hay. Some unique prairie species are also found in a sand savanna located north of Gifford in southeastern Hardin County. A few relic species also remain in railroad rights-of-way and on land not suitable for cultivation.

Land Use Impacts

Land use studies have been conducted in both Hardin and Grundy Counties and plans for future land use have been compiled to serve as a broad guide for future development. (Figure 13 illustrates county land use and transportation plans as presented in the respective County Comprehensive Plans). These plans indicate that agriculture will continue to predominate in both counties and that new development, both residential and commercial, will occur primarily within corporate boundaries. Natural drainage areas, timberland and other unusual land forms have been integrated into an open system of greenbelts and conservation areas in Hardin County. Future development of the greenbelt is shown in the greenbelt master plan, Figures 15 and 16. Because much of this area is in private ownership, it is anticipated that scattered individual dwellings will appear within the general locale of the greenbelt where wooded areas afford attractive building sites.

County zoning policy and full access control along the new highway will be used to control the potential for changes in future land use patterns in both counties. Accordingly, construction of relocated U.S. 20 should not present a threat to land use patterns nor should it stimulate development of a nature or location that is not compatible with current land use planning.

To most effectively serve the various existing and future land uses in the corridor, county transportation plans have been developed in both Hardin and Grundy counties. Derived through systematic evaluation of existing highway and county road networks, the transportation plans provide a basis for meeting projected future traffic needs. The general alignment of relocated U.S. 20 has been included in both plans for the purpose of accommodating area traffic service demands and long-distance traffic movements. The alignments shown generally follow those which are presented in this document.

Farmland Impacts

Possible project impacts to farmland in the two county study corridors were evaluated with the assistance of area landowners, county, and state farm bureau representatives, and the Hardin and Grundy County offices of the Soil Conservation Service. Farmland Conversion Impact Ratings (Form AD-1006) have been completed and are attached in the Comments and Coordination section of this report.

Estimated right-of-way needs for each of the alignments under study is shown in Table 5 below. These figures are based on linear measurements of project aerials, using a 300-foot highway cross section.

TABLE 5

RELOCATED U.S. 20
ESTIMATED RIGHT-OF-WAY NEEDS
BY LAND USE TYPE

	Right-of-Way Needs in Acres		
	Crop/Pastureland	Woodlands	Acres Classed As Prime Farmland
Alternative A	617	19	101.6
Alternative B	531	25	113.6
Alternative C	564	19	127.0
Alternative D	599	6	125.3
Grundy County Common Alignment	992	4	954.0

The location of the relocated U.S. 20 corridors lies within three soil association areas. The Clarion-Nicollet-Webster Association occupies the majority of Hardin County except near the eastern boundary. The Tama-Muscatine Association includes the eastern boundary of Hardin County and most of Grundy County, except for the northeast half of the county, which is of the Dinsdale-Tama soil association.

The favorable physical and chemical properties of the soil and nearly level topography combined with favorable climatic conditions give Tama-Muscatine and Dinsdale-Tama soils a high productive capacity, making the study corridor some of the most productive in Iowa.

Except for wooded parcels located in and near the Iowa River in Hardin County, land use in the corridor is nearly all devoted to crop production. Typically, this includes corn and soybean production on a rotating basis. Some land is used for animal pasture; however this is a comparatively small amount, with perhaps as much as 95 percent under annual cultivation. Land use patterns are shown in project aerial photographic plates (Plates 1 through 20) located in Appendix 2 of this report.

With the exception of those agricultural acres listed as prime, there were no unique or other classes of land found which would be of local or state significance.

Measures to minimize harm to area farms and agricultural lands incorporated into preliminary highway design have included alignment modifications to avoid farmstead and farming operations where feasible, and use of a minimum right-of-way cross section to reduce overall acreage needs. At some locations, existing roadbeds or former railroad corridors have been incorporated into proposed study alignments as an additional measure to reduce right-of-way conversions.

Additional Farmland Impact Concerns: Diagonal Severance

Because the landscape of Iowa is dominated by farming operations, with agriculture and agricultural based industry accounting for a significant portion of the state's wealth, land stewardship is an issue of unique sensitivity by a majority of the state's residents as well as all levels of government.

This concern for the land was most recently reaffirmed in the Iowa legislature through adoption of legislation that mandates the avoidance of diagonal severances to farmland to the maximum extent possible. Paraphrased, this 1989 law states that..."it is the policy of the state of Iowa that relocation of primary highways through cultivated land shall be avoided to the maximum extent possible." Continuing, this new law also requires that..."diagonal routes shall be avoided if feasible and prudent alternatives consistent with efficient movement of traffic exist."

The Iowa Department of Transportation supports this policy and attempts to minimize farmland impacts, especially those requiring diagonal severance of farmland, unless there are compelling reasons for not doing so. In this respect, the alternatives prepared for new Highway 20 present a range of solutions for highway relocation each providing for the efficient movement of traffic through the corridor. These alternatives, as previously discussed in this document, are also directed at combining a balance between satisfactory traffic service and the myriad of potential impacts to the natural environment of the study area. Given the need to avoid or minimize the many other potential impacts associated with highway relocation, the four alternatives developed for the Hardin County portion of the corridor are considered to be reasonable and prudent approaches for future highway construction.

Social Impacts

Since the planned U.S. 20 improvement is located in a rural setting in both Hardin and Grundy counties, project construction will not affect residential developments in the corridor, regardless of alternative. Consequently, existing residential and neighborhood character in area communities will be preserved and potential social impacts of construction will be limited.

Although the proposed common alignment passes through the southern portion of the community of Dike in Grundy County, this section of the city is less developed. Currently, new residential development is taking place on the east side of town, and project construction is not expected to present any substantial impacts to this community's social makeup.

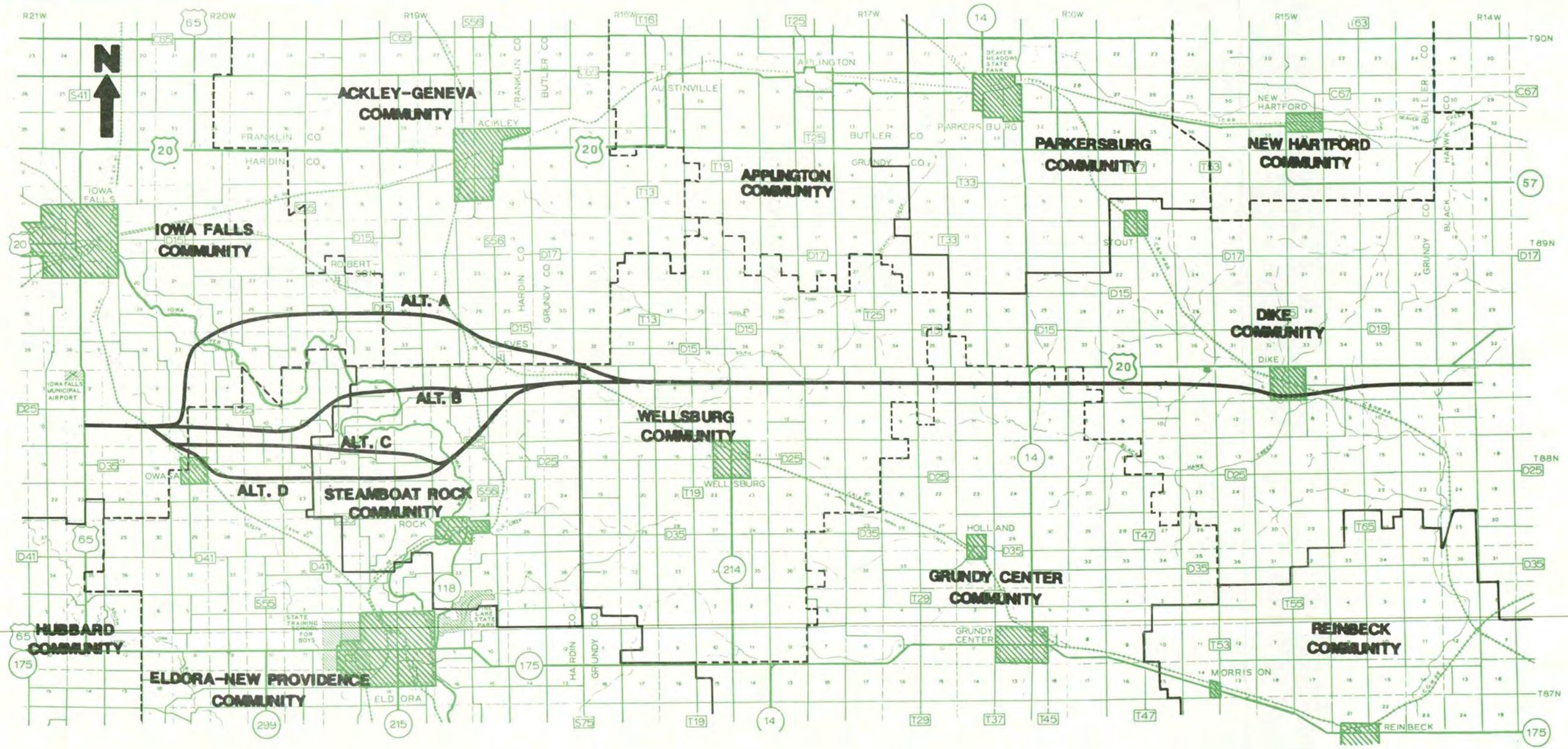
U.S. 20 relocation will also have no effect on minorities or other specific groups within the study area since construction will not affect any established neighborhoods or groups with a cultural, racial, or religious identify.

Highway relocation will result in changed travel patterns through both Hardin and Grundy Counties to some extent as a result of the introduction of a new transportation corridor where none previously existed or where travel was limited to secondary roads. This will be especially evident at those locations where additional out-of-distance travel is required due to road closures associated with construction of a full access control highway. The overall effect however, will be an improvement in safety and accessibility which will be applicable to all area transportation needs. This should be particularly apparent for farm to market trips, law enforcement and emergency vehicles, and for the many recreational users who visit the Hardin County greenbelt.

Project construction will present few if any foreseeable impacts to bicycle or pedestrian travel patterns in the corridor. Similarly, there are no foreseeable significant negative effects on area utilities, medical facilities, churches, or other social institutions except for possible short-term impacts due to project construction (which will be mitigated to some extent by phased construction). Impacts to area commuters should be beneficial as a result of a more direct and efficient highway facility.

Area school districts were contacted concerning the proposed improvement and asked to comment on potential impacts to district operations. The location of area school district boundaries is shown in Figure 18. Most had no comment or stated the new facility would be an improvement over existing conditions, although construction will present direct impacts such as changed access patterns on bus routes and right-of-way impacts. Project construction will require some changes to existing school bus routes because the new highway will be located in a different corridor and will be a full access controlled highway. This will limit the number and location of access points, but even so, should not present a long-term hardship and will in some cases increase route efficiency.

Because the construction corridor is located in a rural setting, the most apparent social impact will be conversion of farmland to transportation uses, along with the subsequent disruption to area farming operations. This effect will be common to each alternative and represents an irretrievable commitment of an existing resource in the corridor. And, although land conversion and relocations will be minimized wherever possible, conversion of agricultural land and changes in farming operations will be an unavoidable result of project construction.



COMMUNITY SCHOOL DISTRICT LOCATIONS

Relocated US 20 Study Corridor

FIGURE 18

This will result in modifications to present farm access patterns at a minimum and in the worst cases would include actual displacement of existing farmsteads and removal of cropland from production. In view of these circumstances, it can be expected that project impacts to area farms and farm families due to highway construction will be substantial and result in varying degrees of impact to those affected.

Local land owner concerns in this regard were a focal point during preparation of the first series of environmental reports published in the 1970s for relocated U.S. 20, and were reaffirmed at the public meetings held in the fall of 1987 after publication of the U.S. 20 pre-location study. Since that time this issue has remained at the forefront of area landowner concern and has been the subject of many letters and meetings encouraging a highway design that is direct and minimizes use of agricultural lands.

Many area landowners have also expressed concerns about what they feel is over-sensitivity to the greenbelt environmental issues. They have pointed out that such intrusions as uncontrolled snowmobile operations within the Iowa River Valley have had a similar noise and physical impact to wildlife and associated habitat as would a new highway. They also point out that wildlife such as deer are as prevalent in open farm fields, where they feed, as they are in the wooded areas and that wildlife habitat and trees are a renewable resource but that prime farmland is not. As a result of these discussions, there is a considerable amount of support among landowners in the corridor for greenbelt Alternative B, which minimizes the acquisition and severance of farmland.

Relocation Impacts

During preliminary location engineering for U.S. 20 planning efforts were focused toward minimizing project impacts, to the greatest extent possible, within the study corridor. For example, where feasible, alternative alignments were adjusted to avoid homes or farms and to miss better quality natural habitat, points of cultural interest and so on. In the case of relocation impacts, this process was successful to some degree, however, given the nearly 40-mile length of the proposed highway relocation, not every home or farmstead was missed.

Relocations associated with the common alignment and greenbelt alternatives are shown in Table 6 below. None of these potential property acquisitions are known to involve minority or ethnic groups.

TABLE 6

POTENTIAL PROJECT RELOCATIONS

	Farmsteads	Other	Owners	Tenants
Common Alignment	2	2*	1	1
Alternative A	1	1**	0	1
Alternative B	1	--	1	0
Alternative C	2	1***	2	0
Alternative D	2	1***	2	0

* Includes a church and county maintenance garage located in the community of Dike near the eastern end of the project.

** One barn, grain bin, and a shed.

*** River cabin not used as a permanent dwelling.

Analyzing the preliminary information available on possible relocations, all of the homes to be displaced within the highway corridor are rural farmstead dwellings. While acknowledging that providing replacement housing for rural relocatees can be difficult, in Iowa such difficulties are being minimized by incorporating additional lead time during the initial planning and relocation process. Additionally, complicated relocation assistance problems are being further addressed by the state of Iowa's commitment to provisions of 49 CFR 24.404, dealing with replacement housing of last resort.

A survey was also conducted by the Relocation Assistance Section of the Iowa Department of Transportation's Office of Right of Way regarding anticipated residential acquisitions identified as part of the U.S. 20 relocation project. A summary of this survey is as follows:

Residential:

There were no significant family characteristics encountered that would pose a problem for Relocation Assistance.

A review of available rental housing and housing trends in the area indicated that replacement housing should be available. Should a shortage develop during the relocation process, the provisions of Last Resort Housing will be implemented to insure the availability of replacement housing.

Business/Farm Operation:

The proposed acquisition will impact farming operations in the corridor including the potential relocation of farmsteads. Additionally, some farm buildings and grain storage facilities will have to be reestablished and the Relocation Assistance Program will be utilized to provide reestablishment assistance on a case-by-case basis.

Non-Profit Organizations:

Two non-profit organizations may have to be relocated as a result of project construction. The Liberty Baptist Church and the Grundy County Maintenance Shed, both in Dike. There is vacant land in this area suitable for replacement sites and it is anticipated both facilities will relocate and stay in the Dike area. In addition, the Iowa DOT intends to pursue functional replacement of both land and facilities for the Grundy County maintenance garage that would be acquired under the common alignment segment of the project.

It is the policy of the state of Iowa that displaced individuals receive fair and equitable treatment, and do not suffer disproportionately from highway programs destined for the public as a whole. Those individuals required to move as a result of a highway construction project, whether an owner or tenant, will be eligible for relocation assistance advisory services, and may be eligible for moving assistance, supplemental housing payments, and reimbursement of expenses incurred in purchasing replacement housing (such as the difference in increased mortgage interests costs). Every attempt is made to provide equal or better housing for all relocatees. Relocation assistance agents are employed by the state to explain all available options. The state of Iowa's acquisition and relocation program will be conducted in accordance with the uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and provides relocation resources to all residential and business relocatees without discrimination.

Economic Impacts

For the purpose of evaluating potential impacts, economic factors have been divided to include the long-term and short-term consequences, combined with both direct and indirect impacts of project construction. A discussion of these effects, which is applicable to all alternatives, along with a summary of past work regarding economic concerns is as follows:

Summary of Past Studies and the Scoping-Early Coordination Process:

Earlier studies for relocated U.S. 20, which include the 1974-77 final environmental impact statement, the 1987 prelocation study, and the numerous public meetings held during the initial phases of the most recent development of this project, indicate that local and regional support for the project is based primarily on economic development interests. Area officials and the business communities in Hardin and Grundy Counties as well as those across north central Iowa feel there is a need for a major east-west highway corridor to improve access to this part of the state.

This perceived need and the potential benefits to be derived from an upgraded highway have been recognized in the legislative mandate expressed by the Iowa 2000 Transportation Plan passed by the Iowa legislature. Relocated U.S. 20 will form one component of this system, with the goals of providing a high capacity, efficient regional highway system and reducing transportation costs for area industry and agriculture.

The relationship of the relocated U.S. 20 corridor to Iowa's economy is pointed out in the comparison of five major east-west highway corridors in Iowa shown in Figure 19.

Long-Term Consequences:

A public investment such as that proposed by U.S. 20 relocation is seen as a positive feature for long-term economic well-being in the corridor and the region. Because this facility represents upgraded access to and from this area, there is little question that the economies involved will be better off with the new highway than without it. Such a facility will be a significant asset to the economic future of the communities and activities located in proximity to the new highway as a result of greater transport efficiency. The new highway will also enhance the potential for attracting new business to the area, and overall may improve the ability of the corridor to compete for economic activity.

Another beneficial aspect of highway construction will be an improved, more efficient area transportation system within the region. The relocated U.S. 20 route, at approximately 40 miles in length, will replace an existing rural primary highway dating from the 1920s, that extends about 55 miles in length and passes through several small communities. Benefits of such construction would be the availability of a modern transportation facility that will provide a connecting link with Interstate 380 to the east and Interstate 35 to the west.

ECONOMIC CONSIDERATIONS IN THE US 20 CORRIDOR

• AGRICULTURE

Farm Population

1st U.S. 20	27%
2nd I-80	23%
3rd U.S. 18	19%
4th U.S. 30	17%
5th U.S. 34	14%

Hog Production

1st U.S. 20	29%
2nd I-80	25%
3rd U.S. 18	20%
4th U.S. 30	16%
5th U.S. 34	10%

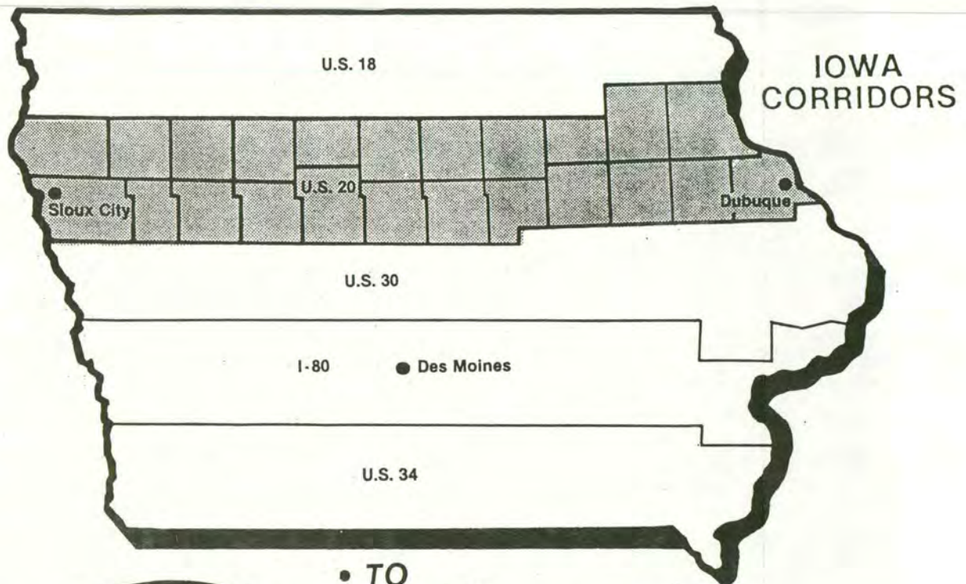
Corn Production

1st U.S. 20	32%
2nd U.S. 18	23%
3rd I-80	20%
4th U.S. 30	18%
5th U.S. 34	7%

Soy Bean Production

1st U.S. 20	29%
2nd U.S. 18	24%
3rd I-80	20%
4th U.S. 30	17%
5th U.S. 34	10%

DATA - MIDWEST RESEARCH, INC. 1983



• *TO*
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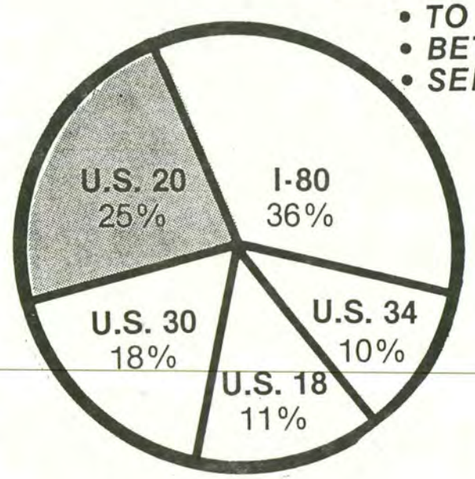
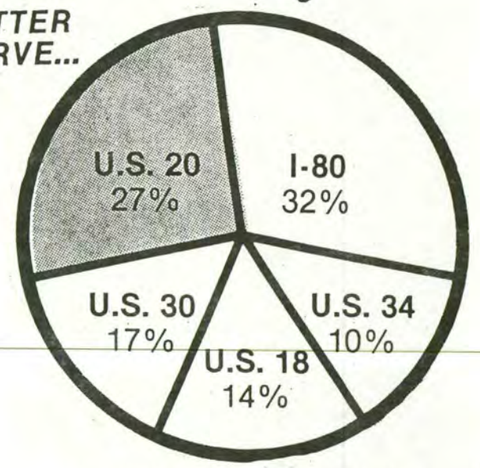


• RETAIL

Per cent of Iowa Retail Sales per corridor.



• WHOLESALE

Percent of Iowa Wholesale firms per corridor.

SOURCE: WHOLESALE CENSUS, IOWA, 1983. U.S. DEPT. OF COMMERCE.

FIGURE 19

Project construction would also avoid out-of-distance travel and provide a reduction of through traffic in those communities located adjacent to the present highway.

Within the immediate project corridor relocated U.S. 20 will provide improved access to the numerous small communities near highways 20 and 175. It would also provide upgraded access to the highly used recreation areas in the region such as Pine Lake State Park (400,000 visitors annually) and the 40 or more local parks and river access locations in Hardin County. Existing local roads and state highways would provide direct access from these facilities and communities to relocated U.S. 20.

The several small businesses and industries within the corridor which generate thousands of truck shipments annually should also benefit from construction of an upgraded highway. Because the ability to move bulk commodities, raw materials, and finished industrial products with speed and economy has deteriorated with the decline of rail service in Iowa, construction of the new highway will serve as a replacement for this lost service.

This provision for an efficient link for highway travel will aid any future industrial and commercial growth in the corridor and should contribute to the economic prosperity of the entire region over the long term. Additionally, the increased mobility offered by the new highway should provide an improved means by which area residents can attain personal economic, social, and cultural development by providing improved access to nearby employment centers, cultural, medical, and education centers. The increased efficiency and safety of a fully controlled access type highway should also assure that travel associated with these activities can be accomplished safely and efficiently over the long term.

Short-Term Consequences:

In predicting economic effects from U.S. 20 relocation, evidence indicates some impacts will result to those small businesses that cater specifically to highway traffic, and which also happen to be located in smaller communities. Research conducted by Robley Winfrey of Iowa State University and published in Economic Analysis for Highways, indicates that adverse economic effects were greatest when the community involved was small (less than 500 residents) because a greater percentage of the total area trade comes from through traffic. There is also evidence however, to suggest that such impacts can be mitigated to some extent if the businesses involved redirect their emphasis to local consumer needs as opposed to the through traveler.

Conversely, some research has suggested that cities with a population larger than 2,000 derived greater benefits than adverse impacts due to highway relocation. The assumption being that remaining shoppers enjoy a more open, less congested environment in which to make their purchasing decisions. Again, however, the improved, more direct access associated with the new highway may present an impact because shoppers will discover the regional shopping centers in

Waterloo/Cedar Falls are more convenient places to shop. This could divert some shopping trips away from the communities in the corridor.

Iowa Department of Transportation studies of economic impacts confirmed that there will likely be some negative impacts as a result of highway relocation, and that certain businesses tend to be affected more than others. In general, these establishments included truck stops, service stations, small cafes, convenience stores, and motels. Follow-up studies after highway relocation indicates the potential for adverse impacts in the aggregate can however, be short term and of limited scope in some cases. This results because enhanced climate for regional growth provided by improved traffic flow and greater community access resulted in economic gains over the long term which offset to some degree any initial short-term losses.

Whether or not the experience of other communities is valid for the study corridor is difficult to predict. In this respect, current economic trends show a continuing decrease in population over the past decade of about 10 percent for both counties combined and decreases in manufacturing activities due to plant closings. Given these circumstances, together with the long lead time necessary to plan, design, and construct a major facility such as is proposed with relocated U.S. 20, it would be at best problematic to attempt an economic forecast for the corridor that would have any measure of reliability. If there is to be economic growth in future years in a rural locale such as Hardin and Grundy Counties however, principal elements of infrastructure such as surface transportation facilities would most certainly be a key element.

Direct Impacts:

Direct impacts are those resulting from conversion of existing land uses within the corridor to transportation uses. The extent of this conversion would vary along the project corridor due to land use variations within each of the project corridors under study, which ranges from cropland, timber, and pastureland to commercial/residential uses and parkland. For comparative purposes, Table 7 details the estimated right-of-way needs for each of the alternative alignments plus the common alignment. This estimate includes both Hardin and Grundy Counties.

TABLE 7

ESTIMATED RIGHT-OF-WAY CONVERSIONS

Alternative	Conversion Acres	Agricultural/ Land Use Pasture	Timber	Total Acres*
A	636	617	19	1632
B	556	531	25	1552
C	583	564	19	1579
D	605	599	6	1601
Common Alignment	996	992	4	--

* Total acres includes both the common alignment total plus the alternative total.

The utilization of productive farmland for transportation purposes with the resulting loss of farm income and tax revenues constitutes a trade-off in land use that cannot be directly mitigated, except for the benefits provided by improved traffic service and access from the new highway. Construction of a new transportation facility could, however, initiate changes in land use which would raise the property tax base of the corridor, offsetting the initial losses. Likewise, money paid for right-of-way may be reinvested as land acquisition and improvements to existing property, restoring to some extent loss of tax base. An additional possible benefit to area grain farmers may be derived through reduced transportation costs to river port grain terminals. These costs are a factor in the price farmers are paid for their commodities, and completion of U.S. 20 should reduce the cost of shipping grain to Mississippi River terminals.

Secondary Impacts:

Secondary impacts are those precipitated as a result of highway construction and are evident as changes in land use near the relocated highway. Secondary impacts could also result in industrial or commercial development outside of the immediate project corridor as a result of an improved transportation system. Typically, new highways tend to generate development in the vicinity of interchange locations, where good accessibility creates a prime location for

business or industry (with the resulting increase in land values and potential for replenishing any lost taxes due to right-of-way takings). Secondary impacts may also result from encouraging the location or expansion of industrial establishments, by providing efficient connections to major transportation routes. This will become more important to regional prosperity as Iowa's rail corridors continue to diminish.

Although the location and design of relocated U.S. 20 is being carried forward in part as a method to enhance economic conditions in the corridor, the intent is to generate controlled expansion and limited land use changes within the area. Both Hardin and Grundy counties are zoned, which can be used to control any potential future developments. Also, the new highway will have limited access control which will provide an additional measure of future land use control adjacent to the new highway. Together, these two factors should discourage undesirable changes within the immediate vicinity of relocated U.S. 20 and help assure land use remains consistent with existing comprehensive development planning.

Summary of Economic Impacts:

Construction of relocated U.S. 20 will, over the long term, result in several desirable economic benefits to both the highway user and the local economy of the corridor. Vehicle users will benefit due to faster average travel speeds (time savings), reduced accident rates (safety), and improved traffic flow (vehicle operating costs). Truck travel will similarly be faster, cheaper, and more reliable.

Construction of the new highway will also remove one impediment to industrial and service industries attraction and growth potential in the form of reduced transportation costs. Reduced transportation costs should also enable the corridor area to better compete for economic activities, meaning that business activity may be expanded in, or otherwise attracted to, the local economy.

The project may also result in an improved climate for travel and tourism within the corridor. If the new highway generates additional visitors for area parks, recreation areas, and tourist attractions, the visitors will spend money in the local economies, thereby increasing the area's income and general prosperity. Improved access to Pine Lake State Park and the Hardin County Greenbelt could potentially result in these areas becoming major generators of recreational and tourist traffic in the region.

These long-term gains will be offset initially by the losses associated with diversion of taxable land to transportation uses. Also, there will be some economic impacts to existing U.S. 20 roadside businesses resulting from diversion of traffic to the relocated highway corridor. Such impacts are most likely to occur in the smaller communities adjacent to present U.S. 20, but should not affect the larger communities which serve as regional trade centers.

Finally, construction of relocated U.S. 20 should not present any foreseeable, long-term, negative impacts to any particular segment of the corridor's economic entities, either public or private. Similarly, the project is not expected to impact any ethnic concentrations. Over the long term construction should have a positive effect on the economic vitality in both Hardin and Grundy counties.

Joint Development

The joint development or multi-use concept proposes that a highway right-of-way be used for purposes other than the movement of traffic. Examples include parking facilities under freeways, housing developments using air space rights over freeways, the use of highway right-of-way for power and fuel lines, sewer, water, waste disposal, and so forth.

Use of joint development can extend to many different applications, but in general it has been used most successfully in urban areas, with somewhat less applicability in rural settings. One potential application for the relocated U.S. 20 improvement however would be the incorporation of scenic overlooks in the Iowa River Valley, with subsequent development of picnic areas, camp sites, and other complimentary facilities. Conversion of borrow sites to county recreation facilities is another possibility. Yet another option could incorporate the identification of sites of historic or cultural significance, with appropriate marking and access points provided along the new highway, and conceivably could incorporate an interpretive center adjacent to the new highway.

Potential joint development options could be integrated into the design of any alternative selected for this improvement and could be maintained by the state highway authority, State Department of Natural Resources, or by agreement with the appropriate county or local historic preservation authorities depending on the type of resource provided.

Implementation of selected joint development options would be helpful as a method to mitigate highway intrusion through the Iowa River Valley, by providing additional area recreational resources as a direct result of highway construction. This would provide tangible benefits to the highway user by providing accessible roadside recreational facilities and scenic values that would not otherwise be available to the traveler. At the same time, the recreational resource base in the project corridor would be expanded, both in terms of increased acreage and the availability of a quality visual and aesthetic experience for the local facility user.

Potential joint development options will be evaluated in consultation with the Iowa Department of Natural Resources and local authorities as project development and alternative selection progresses. Specific recommendations will be included in the final environmental impact statement.

Considerations Relating to Pedestrian and Bicyclists

There are currently no developed or planned pedestrian or bicycle facilities within the limits of the project study area. Hiking trails are evident in some units of publicly owned land within the Hardin County Greenbelt, however, none of these facilities will be physically impacted by the proposed action. Additionally, there are no plans to construct non-motorized facilities in connection with the proposed relocation of U.S. Highway 20.

Air Quality

Because of the rural and open nature of all of the relocated U.S. 20 alternatives under study, expected effects of the highway project on local air quality, either during construction or upon completion, should not be of special concern. Temporary particulate (dust) dispersion would be expected during construction which the contractor would be required to control. Upon opening the completed highway to traffic, mobile emissions of carbon monoxide (CO) and ozone precursers would be expected to have negligible public health or public welfare effects because of the moderate traffic volumes predicted for relocated U.S. 20 and the low exhaust emissions afforded by efficient vehicle operation on the new facility. Even in Iowa's urban areas these transportation-related pollutants have not been a concern in recent years. The U.S. Environmental Protection Agency has reported that all areas of Iowa are now in attainment for carbon monoxide and, generally, Iowa has had no ozone problems (Iowa Air Quality Progress Report, U.S. Environmental Protection Agency - Region 7, April 1990).

The relocated U.S. 20 project in Hardin and Grundy counties is in an area where the state implementation plan for attaining and maintaining the national ambient air quality standards does not contain any transportation control measures. Therefore the air quality conformity procedures (23 CFR 720) for implementing the requirements of the Clean Air Act amendments of 1977 do not apply to this project. (At the time of this writing no new requirements relating to conformity procedures in Iowa have been generated by the Clean Air Act Amendments of 1990).

To further support this determination of very minor air quality effect, U.S. Environmental Protection Agency MOBILE 4 vehicle emission factors (FHWA Technical Advisory T 6640.11, September 1990) were used with the CALINE 3 (California Line Source Dispersion Model) nomograph technique (FHWA Technical Advisory T 6640.6, March 1981) to estimate the maximum hourly carbon monoxide concentration adjacent to the completed facility. This worse case estimate was calculated to be less than 1.0 part per million carbon monoxide at 45 meters from the centerline of the highest volume segment of relocated U.S. 20 (east of Dike). Adding an estimated background CO level of 1 part per million would result in a maximum CO concentration of less than 2.0 parts per million which is safely below the national 1-hour CO standard of 35 parts per million and the national 8-hour CO standard of 9 parts per million. These data substantiate a determination that air quality effects of relocated U.S. 20 upon human health and welfare are not of concern in considering the location of the highway.

Traffic Noise

Traditional analysis of the expected traffic noise effects from highways proposed on new location centers on residential land use adjacent to the proposed route. Usually such land use is scattered isolated farm homes which are not now affected by highway traffic noise. In the case of U.S. 20 in Hardin and Grundy Counties a total of 15-20 individual rural homes would be expected to lie within 400 feet of the proposed highway and traffic noise will become a more noticeable part of the rural residential environment.

But in addition to the traditional traffic noise impacts, the U.S. 20 project generates concerns about the effect of traffic noise upon the natural character of the Iowa River Greenbelt. Traffic noise intrusion into the remote wooded areas of the greenbelt would detract from the wilderness experience of people who enjoy the area's natural features. Additionally there are fears that those wildlife species which require large tracts of remote and undisturbed forest might be adversely affected by U.S. 20 traffic noise.

This analysis of U.S. 20 traffic noise will thus focus on not only the impacts to humans in their residential space but also in their recreational space within the greenbelt and upon the effects to wildlife, especially those secretive species requiring large undisturbed wooded tracts.

Noise Effects on Residential Land Use:

Relocated U.S. 20 is expected to pass within 400 feet of 10-12 rural residences on the common alignment segments of the study corridor east and west of the Iowa River Greenbelt. People living within 400 feet of the highway may notice the U.S. 20 traffic noise on a regular basis although the traffic volumes are such that noise sensitive outdoor activities that involve interpersonal communication would not be expected to be disrupted. The Federal Highway Administration's Traffic Noise Prediction Model was applied to quantify the anticipated year 2015 traffic noise levels. The generalized contour for the noise abatement criteria level of 67 dBA Leq (Leq is the equivalent or "average" noise level and is used in describing highway noise) would be expected to extend approximately 125 feet from the near lane of completed U.S. 20 (approximately the highway right-of-way line) primarily due to the predicted 17 percent truck volume. None of the homes expected to remain adjacent to relocated U.S. 20 would be within this distance to the highway; thus the absolute traffic noise levels at the nearest homes are not expected to be disruptive to noise sensitive outdoor activities. The predicted Leq at a 400-foot distance in the year 2015 is 60 dBA.

The alternatives under consideration within the Iowa River Greenbelt differ only slightly in their degree of residential exposure to U.S. 20 traffic noise, as shown in Table 8.

TABLE 8

Homes Most Affected by U.S. 20 Traffic Noise
in Alternative Greenbelt Crossing Areas

Alternate	Homes Within 400 feet
A	4
B	8
C	7
D	4

Mitigation at Residential Sites:

Because expected traffic noise constitutes a substantial increase in environmental noise levels at some rural residences, federal guidelines require consideration of special noise abatement features.

Scattered, isolated rural homes do not lend themselves to traditional cost effective traffic noise mitigation in the form of solid wall noise barriers because the cost required at each site would be too expensive to be practical. As a result noise increases at most rural residences must be accepted as an unavoidable environmental cost of the transportation benefits afforded by the highway project. Accordingly, no special structural noise abatement features are recommended to be incorporated into the final project design. The use of earthen berms might be practical at some locations depending on topography and final highway design.

Traffic Noise Intrusion Into Natural Areas:

The distance to which a given highway noise is dispersed from the transportation corridor into a natural area is a function of topography, meteorology and intervening ground cover. Hills and bluffs serve as noise barrier systems, wind speed and direction or absence of wind have an effect on the spread of noise and expanses of soft grassy areas, field crops and densely wooded areas all serve to muffle noise to some degree with distance from the roadway.

The highest usage area within the greenbelt is the Iowa River itself. So the recreational "heart of the greenbelt" is a linear and meandering one, but it is the portion of the greenbelt (besides perhaps the scenic drive) where most human activity related to enjoyment of the greenbelt corridor occurs. This might be an appropriate focal point for the quantification of noise intrusion into the greenbelt. To help gauge the distance at which bridge traffic noise and main line traffic noise is measurable within the perpendicular river valley some similar river crossing area sites were selected for traffic noise sampling:

1) The Des Moines River Valley at the U.S. 30 crossing west of Boone in Boone County.

2) The Des Moines River Valley at the I-80/35 crossing along the north side of Des Moines in Polk County, and

3) The Iowa River Valley at the I-35 crossing south of Dows in Franklin County.

At each of these sites the downwind distance at which daytime summer traffic noise was observed to reach typical normal background noise levels (from natural noise sources such as insects, birds, rustling leaves or the like) was observed. These sites were flat with no intervening topographical or man made structures to block the noise; riverine vegetation in the form of mature bottomland forest or tall grass was present at all three sites but did not block the view to the highway.

Table 9 indicates that peak truck noise in the summer can be expected to be easily discernible at a distance of approximately 1,500 feet. This is independent of the daily traffic volumes, but the higher the truck volume the more frequently the "naturalness" of the river corridor within that distance of the highway would be expected to be affected. As a result of this comparison, 1,500 feet would appear to be a reasonable distance at which the U.S. 20 traffic could be discernible for those using the Iowa River for summer recreation.

In terms of expected frequency of intrusive noise events, the predicted year 2015 average daily traffic of 4,380 vehicles converts to a peak hour traffic volume of 438 or seven vehicles per minute, one of which would be expected to be a heavy truck. Because of the severe topography bordering the river, these traffic noise effects would be expected to be confined to the river crossing site; that is, the bluffline overlooking the river would be expected to act as a natural noise

barrier where the alignments parallel the river corridor such that U.S. 20 traffic noise would not normally be expected to be noticeable on the Iowa River beyond the area of the river crossing.

On Alignment B the wintering bald eagle roosting site area is located upstream from the river crossing and could be affected at a distance of approximately 1,200 feet. The upland wooded area to the east identified as potential Coopers hawk nesting habitat would be within the expected noise impact zone of Alternate B and would lessen this potential. At the Alternate C/D crossing one of the bald eagle roosting site areas would be within approximately 800 feet of the highway. Based on the generally accepted separation distance of 1,500 feet recommended between a highway location and winter roosting areas, the likelihood of an adverse effect upon this roosting area is greater than on the other alignments.

TABLE 9

Comparable River Crossing Noise Data

Site No.	Total Daily Traffic	Daily Truck Volume	General Distance At Which Peak Noise = Background = 45-50 dBA ±
1	5,890	648	1,500 feet
2	39,800	6,630	1,500 feet
3	9,410	2,466	1,500 feet

There would be occasions under certain meteorological conditions when U.S. 20 traffic noise would be expected to be heard at greater distances. For example under conditions of calm winds especially during winter months when there is snow cover and no field crops or woodland foliage to retard the traffic noise dispersion, noise from the highway traffic might be heard at the higher elevations at distances of 3-4 miles. The avoidance of steep highway grades at the B or C/D river crossings by a high, bluff to bluff bridge would allow heavy trucks to cruise across the Iowa River Valley at a more constant speed. This proposed design feature would minimize exhaust stack noise resulting from pulling heavy trailers up steep grades.

Inasmuch as Alternative Alignment C/D variation would cross a publicly-owned natural area east of the Iowa River, proximity impacts of the project upon this Section 4(f) land would include traffic noise. Alternate A would introduce traffic noise across three separate areas marked in the Greenbelt Masterplan as proposed priority resource management areas, while Alternate B crosses a single such area at the river. It should be noted however that because of the proximity and generally narrow width of the greenbelt, substantial noise intrusion presently exists as a result of existing farm operations. This noise is particularly noticeable during spring planting and the fall harvest seasons.

It is not felt that traffic noise from relocated U.S. 20 will substantially impair the continued public use of the greenbelt for the enjoyment of its natural qualities regardless of the alignment selected. Although traffic noise would be expected to be noticeable in the area of the river crossing for all the alternatives, this effect would not be expected to deter recreation on the river. In examining a comparable situation as a reference, the presence of a four-mile, interstate type highway across the Des Moines river valley in Boone County has not deterred recreation use of this area. Other areas of the greenbelt traversed by the alignment alternatives would likewise not be expected to be substantially affected. The greenbelt masterplan indicates that Class 3 recreational activities are the most compatible with the "heart of the greenbelt" between Eagle City and Steamboat Rock. Class 3 activities include not only quiet recreation such as hiking, teaching, and bird watching but also trapping, deer hunting, duck hunting, turkey hunting, and squirrel hunting. These recreational activities cited by the masterplan to be most suitable for the heart of the greenbelt would not be expected to be substantially impaired by relocated U.S. 20 traffic noise.

Summary of Traffic Noise Considerations:

Traffic noise from relocated U.S. 20 is not expected to approach or exceed the FHWA noise abatement criteria level at adjacent residences. Several scattered farm homes would be subject to increased traffic noise levels as a result of the project however. No specific noise abatement structures can be recommended for these homes because of costs; solid wall noise barriers are used only in urban locations where a large number of homes can benefit from a single structure.

Noise effects within sensitive portions of the Iowa River Greenbelt are expected to be confined to the river crossings where summertime truck noise is predicted to be generally perceptable (45-50 dBA) at a distance of approximately 1,500 feet up and downstream from the U.S. 20 bridge. Local topography and distance between the highway and the Iowa River is expected to limit traffic noise intrusion into other wooded areas of the greenbelt. A high profile bridge design would be expected to result in less truck noise than a low bridge requiring steep grades on both sides of the Iowa River Valley.

Alternative Alignment B would result in least traffic noise intrusion into publicly-owned natural areas and areas designated in the greenbelt masterplan as proposed priority resource management areas. None of the alternatives would be expected to substantially impair continued use of the greenbelt for natural area recreation, based on the length of river corridor expected to be appreciably affected (approximately 3,000 feet) and the traffic noise attenuation expected to be afforded by the area's natural topography.

Water Quality Impacts

Water quality impacts were assessed in cooperation with the water quality planning section of the Iowa Department of Natural Resources (Iowa DNR). Project materials were also forwarded to the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency for their information.

Iowa River:

Within the study corridor, only the Iowa River has been designated under Iowa's new water quality standards. This river is protected for recreational uses and sport fisheries, and has been designated as a high quality resource warranting special protection to assure that its physical and biological integrity are not altered.

During preliminary planning for relocated U.S. 20 all possible measures have been incorporated into the highway design to avoid impacting the river. No piers will be placed in the waters of this stream, while potential changes to the river bank and upland hillsides would be reduced to minimum levels. Additionally, proposed mitigation includes the presence of a staff biologist during the construction period to monitor impacts to the river and associated aquatic communities. It is also recommended that extensive erosion control measures be in place during clearing and grading operations.

All recommended monitoring/mitigation measures are common to each of the proposed construction alternatives and will be included as part of the project wide avoidance/mitigation plan. These measures should assure that construction impacts to the river will be reduced to the minimum, and that no long-term consequences will result from this action.

Aquifers:

The Iowa DNR has not designated any deep aquifers which may be impacted by construction activities, and consequently no project related impacts are anticipated. Shallow alluvial aquifers are present, but construction activities are not expected to present a long-term threat to these resources.

Well Head Protection Areas - Sole Source Aquifers:

There are no well head protection areas within the study corridor nor are there any sole-source or critical aquifer protection areas designated within the project limits.

Streams and Drainageways:

Streams within the study corridor, such as North Black Hawk and the south fork of South Beaver Creek in Grundy County and Beaver Creek in Hardin County are potential candidates for the Limited Resource designation according to Iowa DNR. This classification is for the protection of aquatic populations associated with

smaller, low flow streams, typically supporting small fish populations (i.e. minnows). The project corridor and its construction activities will likely have a lesser impact on these streams; however review of potential impacts by the Iowa DNR will be completed during the design process as part of the Section 404/401 permit processing. Additional measures to mitigate project impacts will be developed at that time if warranted.

Wetlands:

The Iowa DNR has not designated any functional wetlands sites along the project corridor. If any are encountered, potential impacts and prospective mitigation will be reviewed with DNR to assure that water quality standards are met. (A more lengthy discussion of wetlands is presented in the "Wetlands" section of this report.)

Roadway Runoff:

As a result of highway construction deicing chemicals will be introduced into the project corridor as a result of highway runoff, and is an unavoidable characteristic of winter highway maintenance practices in Iowa. Recent trends however have emphasized more efficient use of chemical deicers with a corresponding reduction in chloride content of runoff. Although no radical changes are seen in deicing practices over the short term, current deicing policies have not been a threat to the state's water supply and this experience should be applicable to the project corridor.

An additional discussion of chemical impacts is presented in this report in the section on Wildlife Impacts, under the heading "Chemical Pollution."

Permits

Section 404 permits are required for regulated activities involving excavating or filling in streams, lakes, wetlands, or floodplains, and includes work such as cutting (excavating) the bank of a stream, dredging, channel changes, or placement of rip rap on river banks. Roadway or bridge construction on floodplains are also included in this permit system.

Although a precise determination cannot be made at this preliminary stage of project development regarding the extent of regulated work that will be included in project construction, it is certain that project completion will involve at least some of the activities described above, as well as those associated with 401 Water Quality and state floodplain construction permits. Accordingly, appropriate permit materials will be prepared and forwarded to the U.S. Army Corps of Engineers and the Iowa Department of Natural Resources for permit processing. Generally, permits are processed after selection of a final build alternative and appropriate levels of final design have been completed. This action will be carried out regardless of the alternative selected for construction and will be applicable to the entire 40-mile+ length of the project.

Wetlands

Wetland Identification and Classification:

Project studies assessed the numbers, types, and total acreage of wetlands in the project corridor and their value as plant and animal habitat. For the purpose of this work, wetlands were identified using the definition contained in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (published January 10, 1989). This handbook uses three criteria as the basic elements to identify a wetland: (1) the hydrology, or frequency of flooding; (2) hydric or saturated soils; and (3) hydric or wetland vegetation.

Within the study corridor, as in Iowa in general, the predominant wetland types belong to the Palustrine system. This system includes vegetated wetlands traditionally known as marshes, bogs, fens, swamps, and other such names. In Iowa, this definition would also include prairie potholes, sloughs, oxbow lakes, riparian forests, seeps, and shrub-scrub wetlands.

Wetland Identification Methods:

The Wetland Survey included in the natural resources data base inventory thoroughly inventoried possible sites which might have wetland characteristics. Multiple sources of information were used to assess the numbers, types, and total acreages of wetlands within the relocated U.S. 20 highway corridor. Where available, draft National Wetland Inventory maps (NWI) obtained from the U.S. Fish and Wildlife Service were used to identify potential wetland areas along each alternative. Infrared and other aerial photographs were used to determine what percent of wetlands along each alternative were under cultivation or in a natural state.

Wetland Survey Results:

Palustrine, or shallow wetlands dominated by vegetation with temporary or seasonal water regimes are the most dominant wetlands type in the project corridor in both upland and lowland terrain. The majority, or about 87 percent of the Palustrine wetlands within the study corridor are in the emergent class. Forested wetlands form the second largest Palustrine wetland class in the project area. Two shrub-scrub wetlands were shown on NWI maps in the project area.

Based on studies conducted during the BRD survey, wetlands are fairly evenly distributed across the project area of the greenbelt, and the differences in wetland acres appear from the fact that the lengthiest alternatives, corridors A and D, have the highest acreage (note that the BRD survey was conducted using a study corridor one mile wide, resulting in identification of wetlands well away from the proposed construction alignment).

The majority of wetlands surveyed in the BRD study in Hardin County have been moderately to heavily disturbed by cattle grazing. This has resulted in soil compaction, erosion, and invasion by weedy plant species more resistant to

grazing pressure. These factors combine to alter or destroy the natural plant communities in these wetlands. It was also the conclusion of the BRD study that few wetlands in the study corridor resemble their natural state, thus affecting their value as plant and animal habitat. Moreover, at least half of the wetlands along each alternative study corridor are under cultivation and have likely been tiled or drained. Additionally, it is quite likely based on field observations that remaining wetlands not associated with the Iowa River have also been altered to improve drainage, further limiting the number of extant wetlands within the study area.

Non-cultivated wetlands occurred mostly along the Iowa River and its tributary streams. Of the wetlands surveyed for their botanical quality, the majority have experienced moderate to heavy grazing pressure by cattle, again, causing trampling of vegetation, erosion, and other disturbances.

Although a large number of wetlands have been identified within the study corridor, few of these will actually be disturbed by proposed roadway construction activities. Avoidance of higher quality wetlands as designated in the BRD study has been incorporated into the initial location engineering work for the project, with the result that no active wetlands sites are expected to be encroached upon by the new highway. Although technically classed as wetlands, those sites that will be impacted do not represent functioning wetland ecosystems (many having been drained), but rather represent seasonal sites with lower quality habitats due to cattle grazing and invasion infestation by non-aquatic plant species. In many cases in Hardin County, and especially in Grundy County, evidence of these potential wetland sites has been completely removed due to tiling and intensive annual cultivation of row crops.

After the alternative selection process has been completed, additional field review will be conducted to further identify specific impacts to affected wetland sites with additional avoidance and mitigation recommendations included in the final EIS. Consideration for wetland mitigation may include acquisition and upgrading of wetlands sites for incorporation into the county park system, reconstruction of existing wetlands sites or use of earth borrow sites as replacement wetland locations. It would appear from the wetland survey that wetland impacts do not vary significantly among the alternative alignments under study and that the expected effects upon wetland resources due to project construction would be minor.

Water Body Modifications

Determinations of potential construction impacts to water bodies and wildlife was coordinated with the U.S. Department of Interior, Fish and Wildlife Service, and the Iowa Department of Natural Resources. This was supplemented by the Biological Resource Data Base study, field studies and research conducted by Iowa DOT environmental specialists, and interviews with local governmental agencies, environmental groups, and residents of the corridor.

There will be no water body modifications associated with the planned action.(1) Project construction is not expected to present long-term, adverse impacts to area rivers and streams regardless of the alternative selected. All proposed Iowa River bridge crossings will be designed to avoid placing piers in the water to minimize the potential for harm to river habitat and aquatic animal communities. Stream and drainageway crossings will be accomplished using concrete box culverts. Such construction will pose short-term impacts (i.e. increased sedimentation during the construction period) however, over the long term no lasting, detrimental impacts are foreseen.

(1) The potential for stream channelization exists with the alignment variation of Alternative A (see Alternatives discussion). With this option approximately 1,400 feet of channelization may be required on South Beaver Creek located southwest of Cleves (see aerial photographic Plate 10) in order to provide clearance for interchange construction. This variation has been developed mainly for comparative purposes, as a means to reduce right-of-way impacts to area farmland resulting from the Alternative A alignment. Because there are a number of complications which limit its feasibility (including potential stream channelization), the Alternative A variation has questionable utility as a bonafide construction option. However, if this line or some variation is ultimately selected, additional study and documentation will be completed with regard to waterbody or water quality impacts, with the findings published in the final environmental impact statement.

WILDLIFE IMPACTS

Habitat Removal

A general indication of habitat loss can be determined by comparing amounts of right-of-way that would be converted due to project construction. A breakdown of right-of-way needs for each alternative plus the Grundy County common alignments is shown in Table 10 below.

TABLE 10

RIGHT-OF-WAY CONVERSIONS

	Preliminary Estimate of Right-of-Way Needs in Acres	
	Crop/Pasture Land	Woodlands
Alternative A	617	19
Alternative B	531	25
Alternative C	564	19
Alternative D	599	6
Grundy County Common Alignment	992	4

Removal of animal habitat vegetation by the project would directly affect those animal species which depend on these habitats for food, water, cover, nesting sites, breeding sites, travel lanes, and others. Food webs in these and adjacent areas would be affected, especially if species from adjacent habitats had previously depended on that site for food.

Permanent changes in habitat types would result in shifts in faunal species composition to those animal species more adapted to the new habitat types. This would be most evident in the highway right-of-way vegetation but would also affect plant communities areas between the right-of-way and adjacent areas.

An additional impact would be the new pressures placed on ecosystems adjacent to the new highway. Animals that formally occupied the area may be forced into these adjacent areas, many of which might not be able to support additional populations. This could be especially detrimental to the woodland communities of the corridor. If the highway proves to be a physical barrier to keep animal populations in an isolated segment of woodland, the carrying capacity of the woodland community may be exceeded, leading to habitat deterioration.

Because the project study area consists predominantly of agricultural land under annual cultivation, however, construction is not likely to present a threat to habitat or wildlife populations in the corridor. Only comparative small amounts of existing habitat would be affected and modifications in alternative alignments have been incorporated into project design to avoid the higher quality habitat locations.

Vegetation Removal

One of the primary impacts of the proposed highway construction will be the removal of some areas of natural vegetation during construction. Portions of upland and lowland forests, prairie remnants, and outlands could be removed. This would be most detrimental to those forests rated higher in quality because these types of forests are uncommon in this area of Iowa and need a long time to regenerate after disturbance. Also, the majority of these upland forests occur on steep slopes that are susceptible to soil erosion.

All of the study alignments encounter some higher quality forested areas. Generally, the B and C corridors contain more acres of these better quality forests than do the A and D corridors, but Alternate A is the only alignment that traverses the highest quality forest in the study area.

Because of the generally disturbed nature of the corridor, evaluation of natural areas and plant communities within the study corridor was accomplished using a natural quality rating scale developed by the Illinois Natural Area Inventory. This scale was applied to 890 forested acres and 68 acres of prairie within the Hardin County greenbelt area.

In general, this rating scheme was composed of the following gradations to delineate the quality of a natural area:

* Grade A communities have a structure and composition that has reached stability and does not show the effects of disturbance by humans.

* Grade B communities are those that have (1) recently been lightly disturbed or (2) have been moderately to heavily disturbed but have recovered significantly.

* Grade C communities have (1) been moderately to heavily disturbed (and may or may not be recovering) or (2) have been severely disturbed but have significantly reverted.

* Grade D communities have (1) been severely disturbed but not recovered significantly or (2) been severely disturbed but begun to recover.

* Grade E communities have been so severely disturbed that the original community has been removed.

Using this rating scheme, the bulk (64 percent) of the forested areas within the four alternative corridors were classified as Category C communities, largely because of logging or grazing. It should also be pointed out there were no areas within the greenbelt that were classed as grade A, due largely to human disturbance having affected the entire greenbelt area. About 15 percent, or 130 acres were classed in category B, and 21 percent or 183 acres classed as grade D communities.

Eighty percent of the prairie areas studies were also classed in the C category (due to past disturbance that included railroad construction, plowing, herbicide application, and grazing). Even though these acres have been disturbed, most appear to have become reestablished or are coming back. Of the remaining prairie, 18 percent (12 acres) were rated D. These areas have been heavily disturbed by the same factors discussed for class C, but do not appear to be coming back to any extent. One acre of prairie received a B rating, indicating it was least disturbed with the greatest recovery rate.

TABLE 11

SUMMARY OF NATURAL QUALITY
ACREAGES FOR EACH STUDY ALTERNATIVE
(One-Half Mile Wide Study Corridor)

Alternative		B+,B,B-,C+	C,C-	D+,D,D-	Total
A	Forest	23	98	92	213
	Prairie	4	26	12	42
	Total	27	124	104	255
B	Forest	54	218	54	326
	Prairie	--	7	--	7
	Total	54	225	54	333
C**	Forest	1	154	36	271
	Prairie	4	5	--	9
	Total	85	159	36	280
D**	Forest	15	64	1	80
	Prairie	5	5	--	10
	Total	20	69	1	90

* Acreage includes all forested or prairie areas within a one-half mile corridor for each alternative.

** Includes 76 acres of overlap between Alternatives C and D.

Refer to Figure 20 for a map detailing forested/prairie areas in the vicinity of each study alternative.

TABLE 12

ESTIMATED ACRES OF FOREST TO BE REMOVED BY U.S. 20 WITHIN GREENBELT
(Based on 300-foot Right-of-Way)

Forest Quality	Alternative Alignments A	B	C	D
B+	4			
B				
B-				
C+			1	
C	7	17	13*	1*
C-	3	3		
D+		(less than 0.5)		
D	1			
D-				
Total Acres	15	20	14	1
Acres Within Master Plan's Proposed Priority Management Areas	15	6	14	1

* Considers complete span of river valley.

Savanna Communities

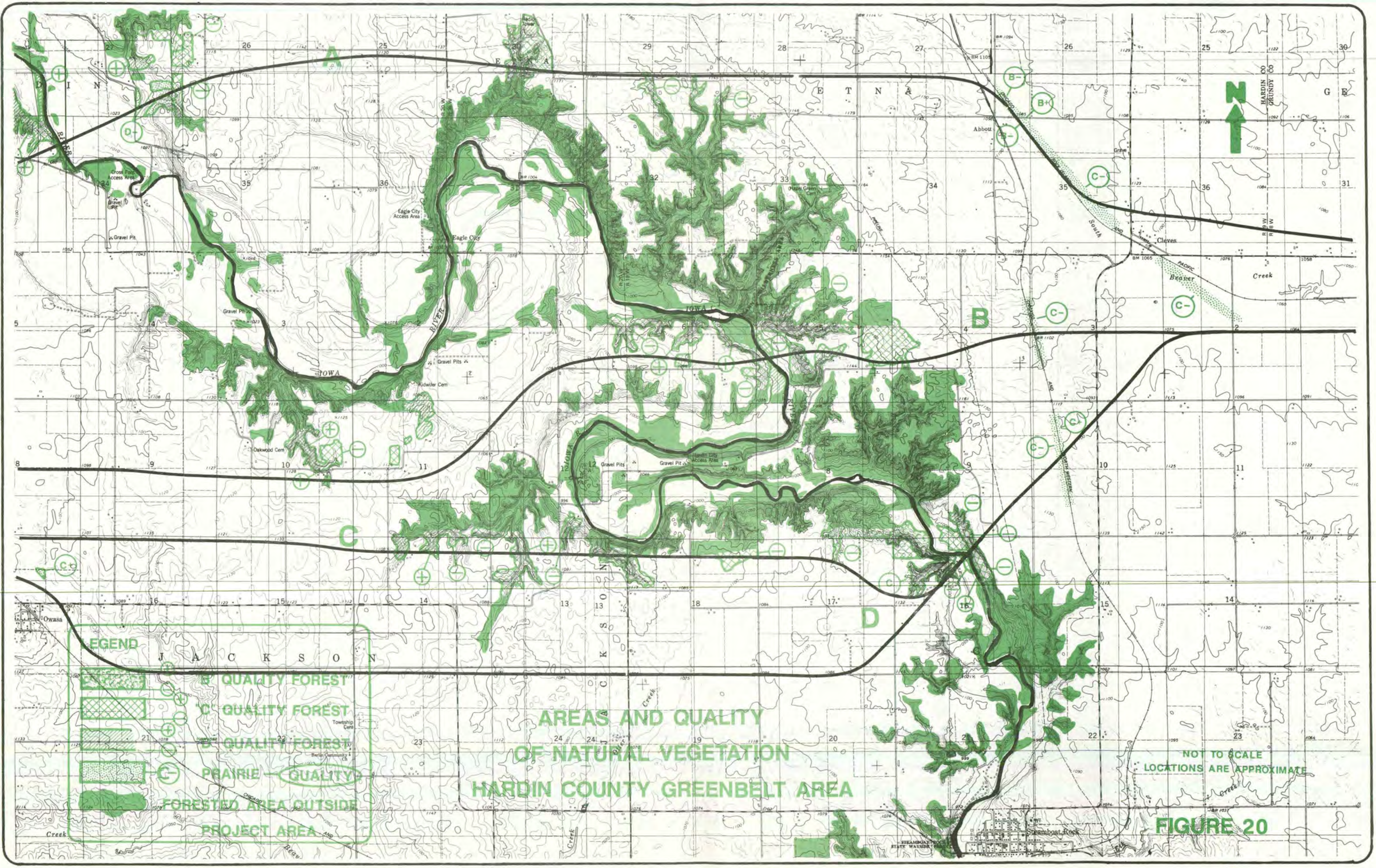
An uncommon plant community encountered in the Hardin County greenbelt during the BRD study was the Savanna. This shrub-scrub vegetation community generally borders forested areas and represents a transitional zone between forests and prairie. Within the study corridor two of these communities were located (see Figure 21) in the vicinity of Alternative B and the common C-D alignment. Alternative B has been shifted to the south to minimize intrusion into this area, and the high bridge concept at the C/D crossing would also reduce such impacts at the south river crossing.

Prairie Vegetation

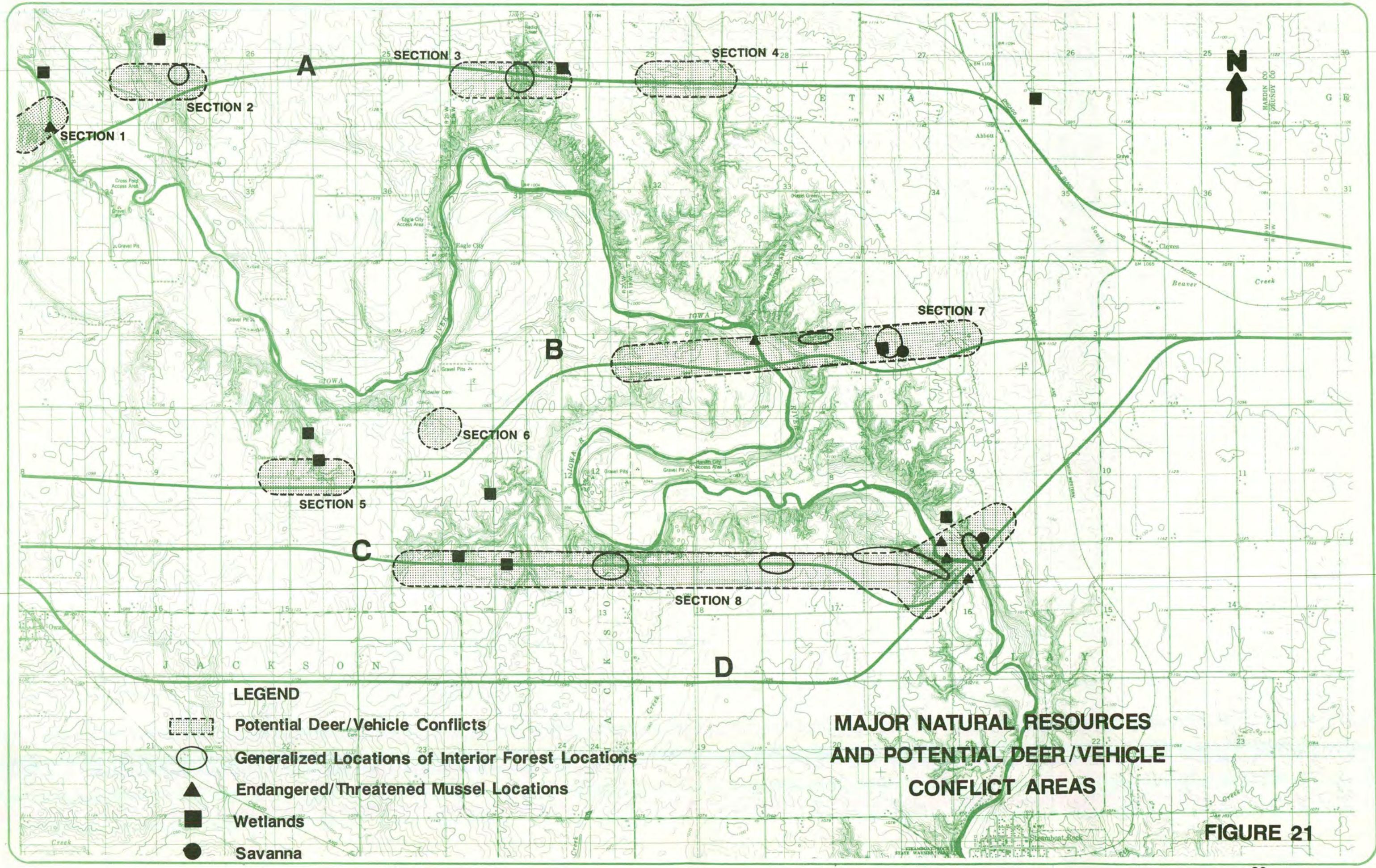
All of the greenbelt alternatives contain limited amounts of prairie vegetation, with Alternative A containing the most. Using preliminary locations and the maximum 300-foot highway cross section, Alternative A may impact from 15 to 25 acres of land described as prairie remnant plant communities. This is due mainly because the new highway corridor near Cleves follows the former Chicago, Rock Island and Pacific Railroad alignment, much of which is classed as prairie. Alternatives B, C and D also cross former rail corridors which contain prairie elements, however, these alignments tend to cross at more severe angles, reducing potential prairie impacts to an acre or less. Final alignment locations within

each alternative corridor would minimize or avoid intrusion into quality prairie areas.

Prairie is also a rare community type throughout Iowa; and even though areas within the study corridor are mostly highly degraded and in need of management, they are a valuable natural resource. Under proper management, many of these could revert to better quality. Also many of the individual species in these areas are sources of seed for prairie reconstruction and prairie landscaping. They would provide the varieties adapted to local conditions. Prairie vegetation areas are shown in Figure 20.



AREAS AND QUALITY
OF NATURAL VEGETATION
HARDIN COUNTY GREENBELT AREA
LEGEND
"B" QUALITY FOREST
"C" QUALITY FOREST
"D" QUALITY FOREST
PRAIRIE — QUALITY
FORESTED AREA OUTSIDE
PROJECT AREA
NOT TO SCALE
LOCATIONS ARE APPROXIMATE
FIGURE 20
N
A
B
C
D
E T N A
J A C K S O N
IOWA
RIVER
Eagle City
Eagle City Access Area
Cross Ford Access Area
Gravel Pit
Gravel Pits
Oakwood Cem
Abbott
Cleves
Owasa
Steamboat Rock
Beaver
Creek
HARDIN CO
GRUNDY CO



MAJOR NATURAL RESOURCES AND POTENTIAL DEER/VEHICLE CONFLICT AREAS

FIGURE 21

Habitat Fragmentation

Habitat fragmentation is the process by which continuous tracts of natural landscape are broken into smaller, isolated units by development of some kind. In Iowa, agricultural development has been a major cause of habitat fragmentation during the twentieth century. However, roads and freeways also cause significant habitat fragmentation by isolation of area-sensitive species, interruption of animal movements, and the creation of artificial edges which favor the invasion of weedy plants and opportunistic edge species (Noss, 1987). Housing, industry, farming, and utility lines are other sources of extensive natural habitat conversion.

In the project area, most prairie and natural wetland habitat has been destroyed or altered so that only forest habitat remains in large acreages. Therefore, evaluation of fragmentation of habitat in the project area will focus on forests.

The project in the Hardin County greenbelt area can be considered a habitat island surrounded by a sea of agricultural development. On a local scale, however, much of the remaining forest has been reduced to fragments too small to support area- and/or edge-sensitive species. This was demonstrated in the raptor survey, where approximately 325 acres or only 14 percent of the total forested area within a mile-wide corridor centered on each alignment was considered potential Cooper's hawk nesting habitat, and only 100 acres (located outside the study boundary) was confirmed as Cooper's hawk nesting habitat. Fragmentation as well as removal of forested wetlands along the Iowa River is a probable cause for the red-shouldered hawk to disappear as a nesting bird from this area. In addition, other observations of area-sensitive or forest interior species such as the ovenbird, Cerulean warbler, piliated woodpecker, and others were rare.

In contrast, edge habitat such as over-grown pastures and forest edges, were common. Edge species known to compete or parasitise interior species were often observed, such as the brown headed cowbird. Nests of the red-tailed hawk, known to compete with Cooper's hawk for nesting habitat (Dinsmore, 1981) were found in forest tracts which may have otherwise been suitable Cooper's hawk nesting habitat.

Thus, remaining interior forest habitat is a valuable and uncommon habitat for less common species in the project area, especially in contrast to the abundance of edge and forest fragments too small to support interior species.

Figure 21 shows the general location of remaining interior forest in the project area within the half-mile wide corridor centered on each alignment. Interior forest habitat was defined following the research of Temple (1986), who found that a 328-foot buffer zone around the core forested area ameliorated the negative impact of edge on interior forest birds in Wisconsin forests. Only core areas larger than 10 acres are shown.

As shown in Figure 21, few remaining forest tracts within the project area are large enough to have a significant core area inside the 328-foot buffer area.

Two tracts occur along Alternative A. The larger tract (Section 3) would be most impacted by highway construction as the other interior tract (Section 2) is smaller and of less potential to support area-sensitive species.

Alternative B also has two areas of interior forest which could be impacted by highway construction. Both of these are potential Cooper's hawk nesting habitat. The smaller tract is also contiguous to the Mann Wilderness, an adjacent tract of public forest. The second and larger interior forest along Alternative B is also considered to be a former savanna.

Alternative C has four areas of interior forest. Although small in area, all four are contiguous with larger forest tracts. Two of these are also potential nesting habitat for the sharp-shinned hawk and Cooper's hawk. The only two interior forest tracts along Alternative D are found on its common alignment with Alternative C.

Interior forest acreage is greatest along Alternatives A, B, and C and less on Alternative D. It is desirable to avoid all interior forest tracts in the project area as this represents one of the most limited habitats in the project area.

Deer and Deer-Vehicle Accident Potential

There is a large deer population in the project corridor, and most of the greenbelt is criss-crossed by deer travel lanes. This, coupled with the locations of each roadway alternative through the greenbelt, creates a situation where high deer-vehicle accidents might occur. See Figure 21.

The number of reported and confirmed deer killed by vehicle collisions in Hardin County totaled 74 in 1988. This is the number of deer kills reported and confirmed by Iowa DNR and/or Iowa DOT officials (personal communication, Willy J. Suchy, Iowa DNR deer biologist). The actual number of deer injured and/or killed may be higher since at least some are not reported or confirmed. From records provided by Iowa DNR, the location of 34 of these 1988 deer-vehicle collisions in Hardin County could be determined. Eighteen of these accidents were reported in the northeast quadrant of the county, the area where the Iowa River Greenbelt is located. Eleven other kills were recorded near the Iowa River from other parts of the county. These accidents were not within the project corridor but on the major paved roads in the area (U.S. 20, U.S. 65, Iowa 175). Only one accident occurred on the county roads near the greenbelt. The current low traffic volumes and low operating speeds in the greenbelt proper probably account for the absence of deer-vehicle accidents here.

The areas with the highest potential for deer-vehicle collisions have been shown to be along those highways that separate deer feeding areas (or cropland) from forest areas, where woodland-field interfaces are close to the highway and low visibility areas (Bashore, et al, 1986). Aerial and topographic maps were examined to determine where these areas were in the project corridor. This information, together with the field observations of deer trails, was used to predict areas where accident potential would be highest as shown in Figure 21.

All four alternative corridors pass through areas where there is high potential for deer-vehicle accidents. The number of miles that were judged to have such potential are shown in Table 13. In addition to these high potential areas, many other portions of each alternative have some potential for deer-vehicle collisions since smaller wooded or brushy tracts along various drainageways may support smaller groups of deer or may be used as travel routes by deer.

TABLE 13

NUMBER OF HIGHWAY MILES WITH
HIGH POTENTIAL FOR DEER-VEHICLE ACCIDENTS

Alternative	Total Miles	Number of Miles With High Accident Potential
A	12	4
B	10	6
C	11	5
D	12	2

Increased road kills of deer will not have a severe impact on the local population. The effect that road kills have on local animal populations has not been well documented, and there are conflicting views on the subject. For most animal species, information on local animal populations is inadequate to determine whether or not road kill has any significant effect on population numbers. A study of white-tailed deer populations in Wisconsin indicated that road kills accounted for only a small fraction of the total deer population (Jahn, 1959).

Other effects on the deer population could be changes in travel patterns and usage areas resulting from the highway location. Loss and fragmentation of wooded habitat caused by adjacent highway-related development might have more of an impact on deer populations than would loss through vehicular accidents.

Animal Road Kills

Road kills of animals is an unavoidable impact of road construction through a rural, natural area such as the Hardin County Greenbelt. Road kills of deer were discussed in the previous section. Other animals that are often road-kill victims include small mammals; birds feeding on the highway or flying by; amphibians, particularly if they have to cross a road during the breeding season; reptiles; and insects. Many animals are actually attracted to the highway for various reasons. Rabbits and reptiles are attracted to the relatively warm and dry surfaces, particularly in the early morning. Deer may be attracted by road salt and vegetation in the roadway median. Carrion-eating animals are attracted by the bodies of road-kill victims.

Wilkins and Schmidly (1980), in a study of road kills in southeast Texas, found that 65 percent were mammals, 17 percent were birds, and 17 percent were reptiles and amphibians. The effect that road kills have on local populations of a particular species has not been well studied, and there are conflicting views on this subject. A study of animal populations adjacent to a newly opened four-lane highway in West Virginia found that some animal populations increased while others decreased (Michael, 1976). For most animal species, information on Iowa

animal populations is inadequate to determine whether or not road kills have had a significant impact on that population.

Travel Lane Barriers

A highway roadbed can often effectively block travel by animals that refuse to venture on the highway. Small forest mammals, such as the eastern chipmunk and the white footed mouse are reluctant to venture onto road surfaces where the distance between forest margins exceeds 60 feet. Medium sized mammals, such as the woodchuck and raccoon, will cross roads wider than 60 feet. A four-lane divided highway may be as effective a barrier to the dispersal of small forest mammals as a body of fresh water twice as wide (Oxley, et al, 1974). As dispersal is known to play an important role in the population ecology of many small mammals the project could have an adverse effect on some small mammal populations. These same authors speculated that roadway barriers may also affect gene flow between small mammal populations on either side of the roadway, thus fragmenting gene pools.

Another animal travel lane that might be blocked would be one between lowland and upland areas. During periods of flooding, lowland animals often find refuge in upland areas, likewise upland species depend on feed or water in lowland areas. Alternative C has perhaps the most potential to cause such a barrier between lowland and upland areas, as it parallels the Iowa River, for several miles.

Soil Erosion and Sedimentation

During and immediately following construction, some soil erosion and sedimentation will take place as areas are exposed by construction activities. This impact is expected to be greatest in the steep ravine areas and at the Iowa River crossing. The BRD study botanist, Dr. Daryl Smith, has expressed concern about soil erosion into the steep ravine systems in the forested areas as it might affect plant growth.

Aquatic life could be especially adversely affected by increased sediment load, especially during certain seasons. Some species of fish can only tolerate large amounts of suspended sediment for relatively short times, especially the eggs and fry. Schubel et al, (1974) reported that concentrations of 1,000 milligrams per liter of suspended sediment significantly affected the hatching success of perch and striped bass eggs. In addition, large quantities of sediment that increase water turbidity and change characteristics of the bottom can adversely affect the invertebrate fauna which serve as fish food. When aquatic food chains are disrupted, it often requires long periods for their reestablishment.

The BRD study fisheries biologist, Dr. Bruce Menzel, has expressed concern regarding the effects of sedimentation during the early to late spring fish spawning season in this area. This would be especially critical at the A river crossing, where the best spawning habitat is thought to occur. The BRD study malacologist, Dr. Jim Eckblad, has indicated that high sediment loads can be very detrimental to mussel populations. The best mussel populations occur at the A

river crossing, although all river crossings had individuals of three state protected mussel species. Thus, erosion control at the Iowa River crossing during construction will be a very important mitigation measure for this project.

Microclimatic Changes

In the areas immediately adjacent to the highway, some microclimatic changes are expected, such as increased temperature, lower soil moistures, and increased light. Changes in soil characteristics, such as soil compaction, lowers soil moisture and erosion. Clearing of vegetation results in increased soil temperatures and lower soil moisture as well. These changes are not expected to have a noticeable effect except in areas immediately adjacent to the right-of-way in the forested parts of the corridor. The edges of adjacent wooded areas will most likely undergo some changes in species composition related to the microclimatic and light changes.

Weedy Species Introduction

Any operation which removes or seriously disturbs natural vegetation may lead to an invasion or increase in weedy species. Weedy species may also be introduced in the roadway fill, which may be taken from an area that has many weedy, exotic species and introduced into a good-quality natural area. Weedy species may be better competitors than the naturally occurring species (Noss, 1987) and may partially or wholly replace them. There are already many weedy species present in the corridor, indicative of past or current disturbance. This impact is of greatest concern when a roadway is going through a pristine area of an endangered plant habitat.

Chemical Pollution

Roadway construction and operation phases present several opportunities for the introduction of undesirable chemicals into the natural environment. Construction equipment has a potential for minor pollution by accidental spilling of petroleum products or the dumping of used lubricants. This could destroy vegetation in the immediate vicinity of the spill. Likewise, spills could occur from trucks transporting various chemicals and hazardous materials.

De-icing chemicals, particularly sodium chloride, are known to have detrimental effects on roadside vegetation. Injury comes not only from salt contamination of surface runoff but also from direct contact of the plant surfaces with spray from the vehicles. Spray has been reported to affect trees up to 120 meters from the highway (Hofsta and Hall, 1971). Damage is usually higher on the side of the tree facing the highway and on the downwind side of the highway.

Salt apparently interferes with normal photosynthetic and respiratory processes. The most obvious affect on roadside vegetation is burned or browning foliage of susceptible plant species. There is also die-back of shoot tips. Tree species thought to be especially susceptible to salt toxicity include sugar maple, basswood, American elm, white pine, black walnut, and cottonwood. All of these

species occur in the project area. The effect on sugar maple has been most thoroughly documented (Field, et al, 1967). Salt also directly affects all plant growth by damaging soil structure, leading to excess surface runoff and diminished aeration.

Aquatic vegetation could potentially be affected by high concentrations of salt and highway runoff as well. High chloride concentrations in rivers and lake have been associated with highway salting.

Current policy of the Iowa DOT is aimed at reducing the amount of salt usage. Salt usage has been reduced by equipping snow removal vehicles with underbody ice blades, thus requiring less salt. Other measures include the use of sand whenever possible, using weather forecasting, storing salt in enclosed buildings and prewetting salt with liquid calcium chloride (Iowa DOT, 1980).

Chemicals such as herbicides used in maintenance of highway rights-of-way can affect adjacent native vegetation. This is becoming a less common practice in Iowa. With the increased establishment of native species, such application should become less necessary.

The accumulation of lead in roadside soils and vegetation used to be a major concern, prior to the introduction of unleaded gasoline. Today this is not considered to be a major impact of highway operations because of the very low percentage of leaded gasoline that is used.

Noise Impacts on Wildlife

Little research is available of the effects of noise on natural populations of animals. It might be expected that animals that rely on auditory signals to find mates, mark territories, detect and locate prey, evade predators, etc. might at times be affected by highway noise. The impact on animal communication would be especially important for those species that rely heavily on sounds for reproduction and survival, such as many bird, amphibian, and insect species.

Because of the relatively low traffic volumes projected for this roadway, major continuous traffic noise is not expected to occur in the greenbelt area. It is possible that masking of animal communication might occasionally occur very near the highway, particularly adjacent to and underneath the Iowa River bridge crossing.

Creation of New Habitat

Although the highway would remove animal habitat, the right-of-way has the potential for creating new habitats that are favorable for certain native species. Planting of native grasses and forbs would provide food and cover for many grass-eating and seed-eating species. Baker (1971) has pointed out that grasses along highway and railroad rights-of-way have opened new territory to many grass-eating mammals whose habitat had been encroached upon elsewhere. Getz (1978) documented the role of interstate highways in the dispersal of the meadow

vole (Microtus ochrogaster) in Illinois (Klatt and Getz, 1987). Shrub vegetation and highway rights-of-way also provide additional habitat that might not be present in adjacent areas.

Highway rights-of-way also provide nesting sites for some species of birds. Several studies have pointed out the importance of roadsides to pheasant nesting. Wright and Otte (1962) found that roadsides sheltered the highest percentage of pheasant nests in central Iowa on a per-acre basis. It is very common for barn swallows (Hirundo pyrrhonata) to nest under highway bridges. Bats have also been found to use bridges and culverts for both day and night roost (Davis and Cockrum, 1963, Jackson, 1976).

Several species of hawks regularly include highways as part of their feeding territory, probably due to the availability and vulnerability of prey in the right-of-way. It is a common site to see sparrow hawks and red-tailed hawks feeding in roadside right-of-way in Iowa. Some burrowing rodents, such as the woodchuck and pocket gopher, find the well-drained embankments of highways suitable for their burrows (Manville, 1966).

Floodplain Impacts

Floodplain studies for the proposed U.S. 20 relocation were completed in consultation with the Federal Emergency Management Agency, U.S. Army Corps of Engineers, Iowa Department of Natural Resources, county engineers, and areawide planning agencies. The results of this research indicates that in the opinion of the regulatory agencies concerned, highway construction within the study corridor will not present a flooding risk. Additionally, there will be no long-term impacts on the natural and beneficial values of area floodplains, nor will project construction be an incompatible development with respect to the base (100) year floodplain within the construction corridor.

Project construction, regardless of alternative, will not require a federal floodplain development permit and will be consistent with national floodplain insurance requirements. After alternative selection is completed and design details formalized, application materials will be forwarded to obtain floodplain construction permits from the Iowa Department of Natural Resources as well as 404 and 401 permits where applicable.

THREATENED OR ENDANGERED SPECIES

Investigations regarding threatened or endangered species were carried out as part of the Biological Resource Data Base study and were coordinated with the U.S. Department of Interior, Fish and Wildlife Service, and the Iowa Department of Natural Resources, in order to determine the presence or absence of listed and proposed threatened or endangered species. This also included evaluations to determine the presence of any designated or proposed critical habitat that may exist within the study corridor. This work was supplemented by field studies and consultations with local conservation organizations and area property owners. The results of those investigations are as follows:

Plant Community - Species Survey

This sub-study of the BRD study consisted of field surveys over an 18-month period of forested areas, prairies, and wetlands and included a review of botanical and natural history literature to locate pertinent species citations for the study area. Also included was a search of the three state herbaria for species that appear on the state protected plant list. This included all plants on this list that are classified as endangered, threatened, and special concern plants. Unpublished sources of information were also gathered including data collected on a recent biological field review conducted by the Iowa Department of Natural Resources. Discussions with local property owners and county conservation members were also conducted concerning the occurrence of natural vegetation within the study corridor.

Results of the survey indicated a total of 206 plant species were found within the forested areas. Of these, 3 percent were rare, 27 percent were uncommon, 55 percent were common, and 13 percent were non-native, introduced species. The remaining 2 percent were not classified. None of the threatened, endangered, or special concern species that are protected in Iowa were located in this study.

A similar survey was conducted on prairie remnants at seven locations that contain some native prairie species. A total of 68 acres were surveyed in the alternative corridors, with the result that no endangered, threatened, special concern species was found. The largest number of uncommon prairie species were found in the Alternative A corridor - thirteen. Six such species were identified with Alternative D, two with C and none near the B corridor.

Twenty-six wetland sites were surveyed in the corridor and again no endangered, threatened, or special concern species were located.

Results of the overall plant species indicated that no federal or state protected species of plants were found to occur in the project study corridors. Six uncommon species were found at several locations in forested areas however. These species and their general locations in relation to project alternatives are shown in Table 14. The higher quality forested areas which harbor these species are not expected to be affected by the alignments now under study. An exception might be Alternative A which bisects a high quality interior forest area where uncommon species would be expected.

TABLE 14

Occurrence of Uncommon Plant Species Within a One-Half Mile Corridor Studied for Each Greenbelt Alternative

Species	General Alternative Corridor Location			
Paper Birch	--	B	C	D
Oblique Grape Fern	--	B	C	D
Wood Mint	--	--	--	D
Leatherwood	A	B	--	--
Nodding Trillium	A	B	C	D
Ginseng	--	B	C	D
Number of Uncommon Species	27	45	54	33

Small Mammal Survey

The purpose of this study was to survey the four alternative corridors for two protected mammals, the Indiana bat, (Myotis sodalis) and the woodland vole (Microtus pinetorum). The Indiana bat is the only federally endangered mammal that occurs in Iowa. The woodland vole is listed as a state threatened species. The Iowa DNR had identified these two species as having potential to occur in the project area, even though there had been no previous records of either species for Hardin County. However, the steep, forested slopes of the Iowa River valley in this area do provide habitat similar to other areas where these species do occur in the state.

Indiana Bat: Iowa is on the northwestern periphery of the range of the Indiana bat, with verified records of this mammal in Iowa occurring only in the eastern and southern half of the state. The only large hibernating population of the Indiana bat are found in Indiana, Missouri, and Kentucky. In Iowa, nursery colonies have been located primarily in the south-central part of the state (Bowles, 1974; Lauback, et al., 1985). No records of the Indiana bat exists for Hardin County. Bat netting in 1989 and 1990 did not uncover any Indiana bats. Previous studies of this species in Iowa have pointed to climatic factors as limiting its range in the state, and maternity colonies have never been found north of 42° latitude (south of Hardin County). The BRD study concluded that the Indiana bat is probably not a summer breeding resident of Hardin County.

Woodland Vole: The woodland vole inhabits a variety of habitats throughout its range in the eastern half of the United States, and is considered common or even abundant in many areas. Because it has been found in only a few scattered locations in Iowa, it is listed as a state threatened species. Over 3,160 trap nights were expended in the five best quality forested area in 1989 and 90 as part of the BRD study. No woodland voles were discovered in the course of this work.

Evaluation of Natural Habitat

Natural habitat field observations included in the Biological Resource Data base study evaluated forests, wetlands, shrub/scrub/grassland areas, railroad right-of-way, cropland, and migration pathways. Although much of the greenbelt area provides quality habitat for wildlife, none has been designated as critical habitat. As already established however, a number of uncommon plant species inhabit the area as well as a number of migrating raptors (including the bald eagle) which use the greenbelt area during spring and fall migrations (additional information on raptors within the study corridor is contained in the following section dealing with the raptor survey). In addition, because of its topography and forested slopes in a locale otherwise dominated by agriculture, the entire Hardin County greenbelt may be one of the more important migratory flyways in central Iowa.

Fishery Resources

This study investigated the fishery resources of the Iowa River, including the quality of the river and its aquatic environment, as well as the potential for rare and endangered species of fish. Results of these investigations found that at least 47 fish species occur in the Iowa River and its tributaries along the proposed route of relocated U.S. 20 through Hardin County. All may be regarded as common and relatively wide ranging in Iowa.

In Iowa, there are sixteen species of fish recognized as endangered or threatened. Fourteen of these species are unknown within the entire Iowa River Basin. Of the remaining two species, the blacknose shiner (threatened), although once widespread in Iowa, has been extirpated from most of its original range by changing habitat conditions, with virtually no likelihood that it occurs within the project study corridor.

The one remaining species, called the freckled madtom (endangered), is extremely rare to non-existent in Iowa (this fish is known from a single locality in the English River in Iowa County, which may be a relict population of this more southerly ranging fish species) and there is little reason to believe that populations occur further north in the Iowa River basin.

Based on these findings, proposed U.S. 20 construction would pose no threat to any state endangered or threatened fish species. Also, no federal endangered or threatened fish species is known within the project area.

Mussel Survey

The purpose of the mussel survey was to evaluate the mussel population occurring in the Iowa River and to determine if federal or state protected species were present. Populations at the four alternative river crossings were evaluated separately. Data on the sizes and growth rates of individual species were also collected and evaluated as indicators of health of the population.

Conclusions from this study noted that mussel fauna of the segment of the Iowa River studied is very diverse and abundant when compared with other inland streams in Iowa. No federally endangered or threatened mussel species were found within the 17-mile section of the river sampled. Three threatened or endangered mussel species for Iowa were found at each of the four alternative river crossings however. These were the Strange Floater (Strophitus undulatus - threatened), Elktoe (Alasmidonta marginata - threatened), and Flutedshell (Lasmigona costata - endangered). A description of the range of these mussels in Iowa is as follows:

The Strange Floater mussel is still found scattered in several river systems, although never in abundance. The best populations now are in the Maquoketa, Buffalo Creek, and possibly some Cedar Creek River tributaries. A very tolerant species elsewhere, it was formerly very abundant in the Mississippi but is now rather rare. Nationally, this mussel is not yet in substantial danger.

The Elktoe mussel was formerly very abundant in the Iowa, Cedar, Wapsipinicon and Des Moines Rivers, but uncommon in the Mississippi River. It is now extinct in the Mississippi and Des Moines Rivers, and very scattered in the Cedar and Wapsipinicon. It was thought to be extirpated in the Iowa River. Best remaining populations are in Buffalo Creek and in the Cedar River above Osage.

The Flutedshell mussel was never abundant in the Mississippi River and was thought to be extirpated from the Iowa River. Formerly present, sometimes abundantly, in the medium and large interior streams, it is now missing from most. Surviving populations are known at one site in the Cedar River and a few in the Wapsipinicon River and Buffalo Creek, although at each location it is quite rare.

Regarding mussel populations in general, it was found that during the early part of the century there was a decline in populations in the upper Mississippi and many of its tributaries. Shimek (1935) attributed this decline in the Iowa River to stream pollution by municipalities and industries. He also pointed out that in both the Iowa and Cedar Rivers, "most of the fine colonies have been destroyed and only a few scavengers remain." Other factors thought to have negatively affected mussel populations are agricultural fertilizers and pesticides, siltation from farm runoff, and removal of streamside vegetation. Dredging, channelization of streams, and reservoir constructiond also have had negative impacts on mussel populations.

Additionally factors that have affected populations are reductions of fish populations and diversity, as most mussel larvae are parasitic for weeks to months on fish, and many mussel larvae are specific to a particular host fish species. Given these conditions, there is little evidence that the Iowa River can be classed as critical habitat for any of the rare mussel species cited earlier.

Field sampling of mussel populations within the 17-mile segment of the Iowa River indicated mussel abundance and diversity was highest at crossing Site A, and lowest at Site C/D. Sampling at each of the alternative crossings was done in July and August 1989 as part of the Biological Resources Data Base report. A summary of the findings of this work is shown in Tables 15 and 16, below:

TABLE 15

Live and Dead Mussels at Four Transect Sites
(Alternative River Crossings)

	All Species					
	Site A		Site B		Site C/D	
	Live	Dead	Live	Dead	Dead	Live
Individuals	189	678	80	215	36	28
Number of Species	14	16	11	12	8	9

TABLE 16

Occurrence of State Endangered and Threatened Species of Mussels in the Project Corridors

	Mussel Species					
	Fluted Shell		Strange Floater		Elktoe	
	Live	Dead	Live	Dead	Live	Dead
Alternative A						
Number From Transects	4	56	2	11	7	39
*Qualitative Sample	X	X	X	X	X	X
Alternative B						
Number From Transects	1	10	4	1	11	3
*Qualitative Sample	X	X	X	X	X	X
Alternative C/D						
Number From Transects				1		
*Qualitative Sample	X	X	X	X	X	X

* Indicates species presence but not necessarily along transect lines.

Because Alternative A showed a somewhat richer mussel community, it would also follow that more potential damage to mussel populations could occur through construction activities at this site. Alternative crossing Site B is ranked intermediate between Site A and Site C/D, which show great similarity in mussel populations. All sites however, show smaller, less vigorous communities than Site A.

Recommendations to avoid or minimize potential project impacts on mussel populations include a bridge designed so that it spanned the river with no pier placed within the river channel. This would most likely result in minimal long-term impact to mussel populations. Other considerations are the need to assure that elevated turbidity levels during the construction phase does not degrade river habitat, and the recommendation that a biologist be present during appropriate portions of the construction process for additional monitoring.

Raptor Survey

A nest search and survey for potential nesting habitat of the state endangered red-shouldered hawk (Buteo lineatus) and Cooper's hawk (Accipiter cooperii) was conducted in all wooded areas within a one-mile corridor on each of the preliminary relocated U.S. 20 alternatives. Other raptors specifically included in this survey were the Sharp-shinned hawk (Accipiter striatus) and the bald eagle.

The approach used for this study included field reconnaissance, field survey, and monitoring, conducted in the later winter, spring, and early summer of 1989. A follow-up study for the bald eagle was conducted throughout the 1989-1990 winter.

Species Distribution and Range:

Cooper's Hawk: Cooper's hawk were considered a common raptor species at the turn of the century by Anderson (1907) and Bailey (1918), being routinely found in wooded areas throughout Iowa, especially in the eastern half of the state. The number of breeding Cooper's hawk in Iowa declined in the 1960s, although adequate records are not available for parts of the state. Decline in Iowa populations is thought to be due to persecution by humans, pesticides, and most recently loss of deep forest habitat (Roosa, 1977). By the 1970s, reports of breeding Cooper's hawk were rare throughout most of the state, except for a few locations in extreme northeast Iowa. This species of hawk was subsequently listed as an endangered species by the Iowa Department of Natural Resources (Roosa, 1977).

The Cooper's hawk is one of the most secretive of all raptors. They nest in the interior of deep, upland forests with a minimum acreage of about 100 acres and hunt mainly in pasture and shrub areas along forest edges. While many raptor species prey on small animals, the Cooper's hawk diet is primarily birds.

Red-Shouldered Hawk: This species was once a common breeding bird inhabiting the floodplain forests along many rivers in eastern Iowa. Like the Cooper's hawk, numbers of breeding adults began to decline during the early 1960s. By 1978, only five breeding pairs could be located (Bednarz, 1979). Red-shouldered hawks were first listed as a state endangered species in 1977 (Roosa, 1977).

Records indicate that red-shouldered hawks restrict their nesting to mature or medium age floodplain forest of at least 250 acres (Bednarz and Dinsmore, 1982; Dinsmore, 1981). Nest sites located in Iowa have been located often near the confluence of two streams, which are dominated by typical floodplain tree species. Mature floodplain forests typically have well developed overhead canopy in which red-shouldered hawks usually build their nests. Adults of this species seldom build nests in any area unless this well developed canopy is present.

Sharp-Shinned Hawk: This species is a small, jay-sized hawk often referred to as a smaller version of the Cooper's hawk. This species preys primarily on birds and prefers to nest in young, dense coniferous or deciduous forests. Although the sharp-shinned hawk is one of the most common raptors to migrate through Iowa,

there are no documented nestings in the state since 1917 (Dinsmore et. al., 1984). However, there have been at least six summer sightings in the last 20 years which suggests they may occasionally nest in the state (Roosa and Straver, 1989).

Habitat destruction and probably pesticides are the major causes of this species' decline. The sharp-shinned hawk became listed as an extirpated species from the state in 1977.

Bald Eagle: The federally endangered bald eagle (Haliaeetus leucocephalus) ceased to nest in Iowa during the early part of this century (Dinsmore, et. al., 1984) and declined in numbers as winter residents and migrants since the late 1950s. Between 1960 and 1980, bald eagles continued to suffer serious declines largely due to environmental pollution (Evans, 1982). Habitat loss (Sprunt, 1969), human encroachment (Weeks, 1975), as well as reproductive failure caused by eggshell thinning due to use of DDT (Hickey and Anderson, 1968) have caused the bald eagle to be extirpated from much of its former range. It has been listed as federally endangered since 1978 (USFWS, 1978).

Suitable wintering habitat for bald eagles must provide night roosting sites, a consistently available food source, feeding habitat, and daytime roosting areas. In Iowa, normal wintering range for bald eagles includes all of the state with a substantial portion of the eagle population wintering along the Mississippi and Missouri Rivers. Apparently, increasing numbers of eagles winter near man-made lakes at Red Rock, Saylorville, and Rathbun Reservoirs while smaller numbers winter along several interior rivers in Iowa, such as the Iowa River in Hardin County.

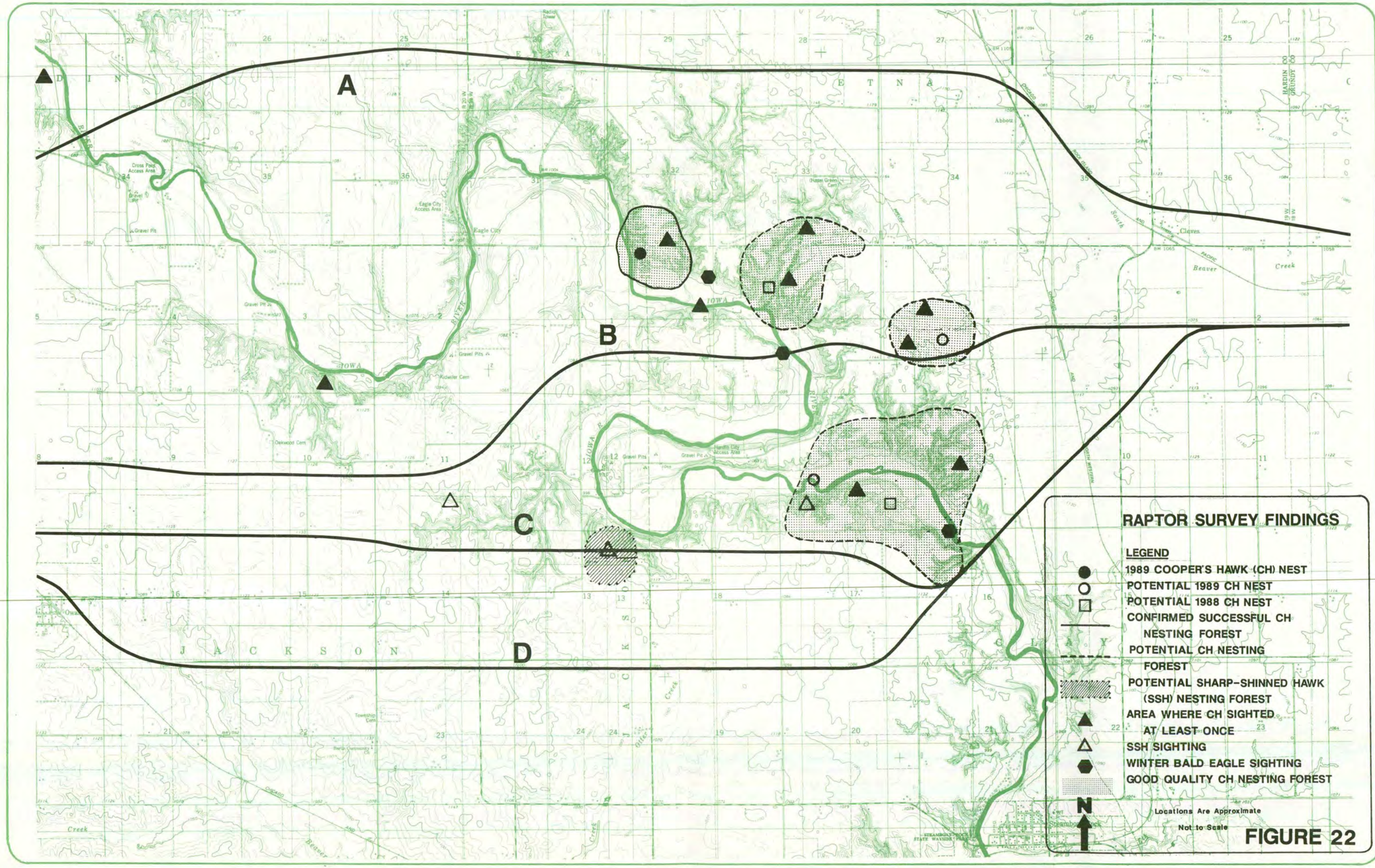
During the bald eagle study within the relocated U.S. 20 corridor, investigators observed three bald eagles in areas that would be impacted by river crossings for the proposed highway. In addition, several local residents stated in interviews that eagles have been commonly seen between Iowa Falls and Steamboat Rock throughout the winter for a number of years. This area may well be one of the few traditional bald eagle wintering locations in the interior of Iowa, and it is for this reason that the eagle study period was extended into 1990.

The survey for wintering bald eagles indicated that at least one adult and possibly two to three juvenile bald eagles were using this segment of the Iowa River throughout the 1989-1990 winter. Six winter areas were identified in the project area at or near the river crossings of all alternatives. Night roosting sites, a critical component of eagle winter habitat, were located within the Alternative B, C and D corridors.

Raptor Survey Conclusions and Recommendations: Lack of suitable forested nesting habitat appears to be the limiting factor for the presence of Cooper's hawk, Red-Shouldered hawk, and Sharp-Shinned hawk in the project area. Since pre-settlement times, forest cover has been considerably diminished in the project area. Of the approximately 2,400 remaining acres, only about 375 acres or 16 percent are considered suitable nesting habitat for the Cooper's hawk or

Sharp-Shinned hawk. No suitable Red-Shouldered nesting habitat remains. Thus, all measures should be taken to avoid confirmed or potential nesting habitat of these birds. In addition, mitigation measures such as purchase and replacement of forested wetlands and woodlands should consider the habitat needs of these birds and aid in reestablishing stable nesting populations in the areas.

A location map showing the approximate locale of sightings/nesting areas for the raptor species discussed above is shown in Figure 22.


A
B
C
D
RAPTOR SURVEY FINDINGS
LEGEND
1989 COOPER'S HAWK (CH) NEST
POTENTIAL 1989 CH NEST
POTENTIAL 1988 CH NEST
CONFIRMED SUCCESSFUL CH NESTING FOREST
POTENTIAL CH NESTING FOREST
POTENTIAL SHARP-SHINNED HAWK (SSH) NESTING FOREST
AREA WHERE CH SIGHTED AT LEAST ONCE
SSH SIGHTING
WINTER BALD EAGLE SIGHTING
GOOD QUALITY CH NESTING FOREST
Locations Are Approximate
Not to Scale
N
FIGURE 22

HAZARDOUS WASTE

Investigation of hazardous waste sites within the study corridor for relocated U.S. 20 involved field reviews and early coordination with the following agencies: U.S. Environmental Protection Agency (EPA), Iowa Department of Natural Resources, Division of Environmental Protection, and the county engineers in Hardin and Grundy Counties. The purpose of this review was to identify permitted and non-regulated hazardous waste sites as defined by the Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Three EPA regulated sites were located in Hardin County, and one unregulated site (city of Dike landfill) was located in Grundy County. Proposed highway construction will not affect any of these sites, and accordingly no further study was undertaken regarding potential impacts or mitigation.

Historic-Architectural

A Phase I historic architectural survey was conducted in 1990 along proposed alternatives for the relocation of U.S. 20 through Hardin and Grundy Counties. The work was performed by the University of Iowa Highway Archaeology Program under contract to the Iowa Department of Transportation. The historical and architectural survey project, including all alternatives and common alignments, spanned 95 linear miles, beginning at U.S. Highway 65 south of Iowa Falls and extending east through Hardin and Grundy Counties, ending at relocated U.S. 20 at the Black Hawk County line. As a result of modifications to the proposed alternative alignments in the vicinity of the Hardin County Greenbelt, a second Phase I survey was completed in 1991, which extended the area surveyed to 120 linear miles.

The comprehensive findings of the historic-architectural component of the relocated U.S. 20 cultural study are contained in the report, "Architectural Resources and Settlement Landscapes of Hardin and Grundy Counties in North Central Iowa, 1990." Volume I contains a historic overview and modern sites, while Volume II contains Iowa Site Inventory forms. A supplemental report published in 1991 documents additional Phase I testing completed as a result of alignment modifications. These documents are incorporated by reference as part of this EIS.

The purpose of these investigations was to identify the architectural and historic cultural resources located within the proposed construction areas and to determine their potential significance for nomination to the National Register of Historic Places. The architectural evaluation of the project consisted of field surveys, photo documentation, preparation of building and site plans, oral landowner history interviews, and historic documentary work for the site locations whose buildings may be removed by project construction activities.

The original Phase I historical and architectural survey identified a total of 54 sites consisting of whole farm complexes, individual buildings, commercial sites, and modern structures and buildings. Of these, nine sites or buildings, all in Hardin County, were recommended to be eligible for the National Register under the various qualification criteria. None of these sites would have been affected by project construction activities however.

The supplemental Phase I survey reduced the total number of historic architectural sites potentially affected by highway relocation from 54 to 27. Of these, no further work was recommended at 16 sites. Six sites were recommended for possible Phase II testing depending on final alternative selection (however two of these sites are outside of the proposed highway right of way and were surveyed for planning purposes only). An additional seven sites (an eighth site was also identified but is located outside of proposed right of way limits) were thought to contain potential archaeological components and were

recommended for Phase I survey if affected by project construction. A discussion of sites recommended for additional study is as follows:

Alternative A: One site, 13-HA-36H, may have potential archaeological components present, and i ateda Phase I level investigation is recommended if this location is affected.

Alternative B: Two sites, 13-HA-10H and 13-HA-23H. The first site represents a possible pre-1875 log house (now a modified gable). The second site represents a remodeled house of early construction on the statehood era town location of Poseyville. Both sites recommended for higher level Phase II testing is impacted.

One additional site, 13-HA-19H may have potential archaeological components present and is recommended for Phase I testing if impacted.

Alternative C: Site 13-HA-2H represents an example of a massed planned, prefabricated, craftman-workers cottage and bungalow family of national housing types, dating from the 1920-40 period. Site 13-HA-13H contains a circa 1930 gambrel dairy barn. Both sites recommended for Phase II testing if impacted.

Alternative D: Two sites, 13-HA-3H and 13-HA-4H may have potential archaeological components present. Phase I testing recommended if impacted.

Common Alignment: Three sites, 13-HA-35H, 13-GN-4H and 13-GN-17H may have potential archaeological components present with Phase I testing recommended if these locations are affected by highway construction.

Archaeological Survey

The archaeological survey project spanned 95 highway miles and covered 4,606.5 acres. A supplemental study was completed in 1991 that included the survey of an additional 25 miles of corridor, involving approximately 1,619 acres of land.

Results of the Phase I archaeological survey are documented in the report "Human Adaptations to Holocene Landscapes in the Iowa River Greenbelt, 1990." A supplemental report published in 1991 documents additional Phase I testing completed as a result of modifications to alternative alignments. Both documents are incorporated by reference as part of this EIS.

A total of 84 archaeological sites were reported in the 1990 study, representing identification of 94 prehistoric components, one historic Native American component, and 17 historic Euro-American components. Cultural periods from Paleo-Indian through modern historic are represented. Completion of the supplemental survey added 11 new sites to this number. Combining the two survey findings resulted in a total of 47 separate sites (as with the historic-architectural studies, only sites within or very near the proposed new right of way have been included in the final total summary.) Of these, no further work was recommended at 37 sites. A discussion of the remaining sites is as follows:

Alternative A: Four sites, 13HA38, 13HA192, 13HA199 and 13HA364 all located within the proposed right of way and representing locations where prehistoric cultural materials were recovered during Phase I testing. Phase II surveys recommended.

Alternative B: Two sites, 13HA80 and 13HA365 representing prehistoric cultural material recovery sites, are recommended for Phase II testing. One additional site, 13HA371, representing a prehistoric cultural material recovery site, is recommended for additional Phase I testing if affected.

Alternatives C/D: Two sites, 13HA65 and 13HA181, each containing prehistoric cultural materials, are recommended for Phase II testing. A third site, 13HA370, also recommended for Phase II testing, is the location of a late 1800s farmstead.

Construction Requirements

Energy requirements during the construction phase of project development will be affected by the type of highway, its location and length. Each of the four alternatives under consideration in addition to the common alignment through Grundy County will be constructed to the same standards (e.g. width and highway type) and therefore would present similar construction energy demands. Some variation would occur as a result of alternative length and the nature of topography, but not to the extent that any alternative would present a clear advantage over the other in terms of the relatively short duration phase of project construction. Also, because each of the four greenbelt alternatives generally offer similar construction concepts that do not impose any special or unique construction requirements, energy use during this phase of development is expected to be negligible as a determinant in alternative selection.

Operational Requirements

Unlike construction energy requirements which are short term, operational energy use is an important criteria in alternative selection. Because a modern highway can be expected to remain in service for up to 50 years (and longer in some cases) while carrying billions of vehicle miles during that lifetime, there is a much greater potential for energy savings, depending on highway design and comparative length.

Each of the proposed relocated U.S. 20 alternatives offer freeway standards, representing controlled access, free flow, interstate type conditions for traffic movement. In this case, the only meaningful variant among these options with respect to opproximate energy savings would be alternative length. Of the four greenbelt variations, Alternative B, with an approximate greenbelt mileage of 10 miles represents the most efficient corridor as it would reduce out-of-distance travel to a minimum. The next most efficient alternative would be Option C at 11 miles, followed by Alternatives D and A with mileages of 11.4 and 12.5 respectively.

Compared with the original alignment of U.S. 20 which consists of a 55-mile facility through six communities (with numerous stop situations and speed limits ranging from 55 to 25 mph) the proposed 40-mile overall length of relocated U.S. 20 (with a continuous 55 mph speed limit) would represent an approximate 27 percent reduction in total route length. Reducing out-of-distance travel, combined with the free-flow characteristics of a freeway-type design would represent an obvious advantage over existing conditions and the no-build alternative, and would be expected to reduce operational energy requirements over the life of the facility. In such a situation, it can be concluded that the savings in operational energy requirements would more than offset construction energy requirements regardless of the alternative selected, and would also result in a substantially measureable savings in energy over the lifetime of the highway.

VISUAL IMPACTS

Any large scale highway project can result in profound changes in the natural environment through which it passes. The space necessarily devoted to a divided, four-lane highway makes it a principal visual element of the landscape. For this reason, it is desirable that the highway corridor be aesthetically pleasing and becomes a harmonious feature of the landscape wherever possible.

The characteristics of the land adjacent to the relocated U.S. 20 alignment, except for the segment bordering the Iowa River, are typical of Iowa and consists of generally flat to rolling, cultivated agricultural land. Within this area are farmsteads and areas devoted to livestock production. Small acreages are also intermingled within the corridor. The land bordering the Iowa River, as established earlier, represents a scenic view of forested river bottoms, hillsides, and open areas with only limited intrusion by isolated dwellings. It is through this area, where each proposed alternative crosses the Iowa River, that the greatest potential for visual impacts exists.

Construction of the project would result in only minimal visual impacts through the generally flat to rolling farmland on both sides of the Iowa River. Limited cutting and filling would be required to produce a smooth, flowing highway facility through this part of the corridor. The gently backsloped and wide, grassy median should produce a pleasing "view of the road" in harmony with the surrounding landscape. The "view from the road" would be typical of much of rural Iowa. Under these circumstances, it is felt that highway construction will present only limited, if any, impacts, and no specific mitigation is planned.

Through the greenbelt area however, highway construction might require alteration of the landscape with cuts and fills to maintain the desirable horizontal and vertical geometrics associated with a freeway class highway. In addition, a sizeable bridge structure will be necessary to span the Iowa River.

Visual impacts at prospective bridge crossing sites will vary because of differences in the amount of tree cover and open land, and because of different land forms and elevation. The potential for avoiding or minimizing visual intrusion at these sites will be somewhat limited due to existing topography and the right-of-way requirements for construction of a four-lane highway facility. An additional limiting factor will be the design parameters that will define the type of bridge to be constructed. Factors that can be used to limit visual intrusion of the highway include reduced cut and fill where feasible at crossing sites and use of a bridge design that will not require the location of piers in the river. Discussion of individual crossing sites is as follows:

Alternate A approaches the Iowa River from the south along a high cultivated terrace which commands a view of the wide river valley to the east. The wooded uplands above the river crossing site are an indication that a change in scenery is to occur. The roadway would cut through the west bluffline at the river and a narrow wooded band on each side of the highway would rapidly give way to .5 mile of wide and open river valley on the east side of the river which would

be crossed on a 10-15-foot high berm. Bridge construction at this location would involve a structure approximately 500 feet in length located about 30 feet above the river. The A alignment would then ascend from this low-lying cultivated area to agricultural land through a proposed priority resource management area of the greenbelt characterized by disturbed hillside prairie and a sparsely-wooded drainageway. Two miles of cropland would then be traversed and the wooded bluffline on the river corridor could be seen to the south and east as the alignment approaches the densely wooded ravine in Section 30 that projects north from the river valley north of Eagle City. Here the directly adjacent wooded areas on both sides of the highway would briefly remind the traveler of the natural character of the greenbelt area. Beyond this woodland the greenbelt forests would be bypassed to the north and relocated U.S. 20 would offer a distant view of the natural portion of the greenbelt at its interface with the surrounding farmland.

Alternate B would cross cropland west of the river crossing, but the greenbelt would be in view for a distance of approximately five miles as the river crossing is approached from the west. Because of its "viewshed" the B alignment would result in a visual contact with the greenbelt but would occupy a corridor outside the actual natural portions of the greenbelt (the proposed priority resource management areas from the Masterplan). At the river crossing the wooded west bluffline converges toward the highway alignment from north and south and the visual resource of the Iowa River Valley would either appear through a transitional cut section across the west bluffline under conditions of a low profile bridge or more immediately from atop the west bluffline if a high bridge river crossing would be selected. At this point the visual resource of the river corridor would offer the most benefits to the highway user in terms of natural scenic diversity. Both "high" and "low" profile bridge concepts were developed for this crossing. For the high profile crossing, two construction options are available; these included a 1600-foot arched bridge design which would be located about 80 feet above the river. A less costly variation of this high crossing concept would incorporate a steel beam bridge using berm construction, resulting in an approximately 1080 foot span located about 70 feet over the river. The low bridge concept would involve a 710-foot steel beam bridge using both pier and berm construction, located about 50 feet above the river.

Upon crossing the river valley alignment B would either ascend through an east bluffline cut (low bridge concept) or pass to the top of the east bluffline spanning the pastured hillside and continuing into upland cultivated parcels. The alignment would veer to the south to avoid encountering the wooded area directly in its easterly path. The visual effect of paralleling the county road in this area would convey a feeling of minimizing intrusion into the forested area but would maintain contact with the naturalness of the greenbelt as the alignment passes northeasterly into open farmland and out of the greenbelt boundary. The Alternate B alignment, then, provides visual contact with the greenbelt's natural areas for approximately seven miles.

Alternate alignment C would allow visual contact with the greenbelt woodlands for approximately nine miles as it skirts a southern extremity of an east-west reach

of the river. Most of the visual contact would occur on the west side of the river as the alignment east of the river passes directly into open farmland.

Alternate alignment D would result in a similar visual experience as alignment C but at a greater distance. The D alignment passes entirely through agricultural cropland beyond the river crossing which it shares in common with alignment C. It parallels alternate C approximately three-fourths mile to the south such that the greenbelt woodlands would not be as significant a part of the U.S. 20 visual experience.

The C/D river crossing would also consist of a high bridge concept using an arched bridge design extending some 1800 feet from bluff to bluff, and would be about 130 feet above the river. A low profile bridge would extend some 1300 feet from bluff to bluff, at a distance of about 100 feet above the river. A high bridge would provide a striking view from the highway of the densely wooded portion of the greenbelt to the north and the more open river valley to the south, while the somewhat lower bridge concept would result in a less intrusive highway crossing of the Iowa River.

The view from the river is also a consideration in assessing visual impacts of the highway project. The lower profile bridge proposed for alternative A would more closely approximate the crossings on local county roads at Eagle City and Hardin City in terms of what the river recreationist would experience. At Alternate B the high profile crossing, preferred because of its lesser effect upon natural vegetation and topography, would be a more dominant feature as viewed from the north as for example a canoeist would approaching this crossing. The bridge at the B crossing would be about 70 feet above the water. The C/D crossing bridge would be most imposing because of its height and its effect in altering the natural openness of the river valley between the high opposing blufflines.

Artist renderings of the Alternate B and C/D river crossings are shown in Figures 23 through 28. Figure 23 shows the Alternative B bridge crossing from an oblique angle, looking east, providing an indication of an example of highway and bridge construction through this corridor. Figures 24, 25, amd 26 show optional example bridge construction alternatives for the Alternative B crossing of the Iowa River. Figures 27 and 28 represent possible bridge construction at the C/D river crossing, using either a high type structure or one located closer to the river surface.

Although any highway construction through the greenbelt would represent an intrusion from the point of view of the greenbelt user, the view "from the road" will be of a picturesque river valley preceded by the tranquil rural setting that is characteristic of the Iowa countryside. These views will be a complimentary factor for highway users and may in fact represent an additional attraction for tourists and park users.

FIGURE 23

FIGURE 24

FIGURE 25

FIGURE 26

FIGURE 27

FIGURE 28

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USER OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The planned regional transportation improvement represented by construction of relocated U.S. 20 is based on state and local comprehensive transportation planning, which considers the need for both present and future traffic requirements within the context of present and future land use development. Each of the build alternatives proposed for this project are consistent with these plans and in general would present similar impacts. Additionally, each represents an upgrading of the area transportation system that will result in a higher capacity, safer, more efficient highway facility, with improved regional access. In view of these circumstances, it can be concluded that the local, short-term impacts and use of resources represented by the proposed action is consistent with the maintenance and enhancement of long-term productivity at both the local and state levels.

IRREVERSIBLE AND IRRETRIEVABLE COMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE RELOCATION OF U.S. 20

Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land use in the construction of the proposed new highway is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material will be expended during the construction phase of project development. Additionally, large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both state and federal funds which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, state, and region, will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of these resources.

CONSTRUCTION IMPACTS

Construction of any of the proposed alternatives except "Do Nothing" will result in certain short-range adverse environmental impacts.

Noise from heavy construction equipment and haul trucks is a relatively short-range but nonetheless disturbing impact upon sensitive land use near the construction site. In an effort to minimize the adverse effects of the construction period, contractors will be required to equip and maintain trucks and machinery so as to limit noise emissions. Contract specifications will also restrict especially noisy construction activity to the daytime hours in order to minimize conflict with noise sensitive nighttime activities. Additionally, contractors will be encouraged to exercise discretion and appropriate public relations policies in response to objections to construction noise which may arise.

Air quality will also be subjected to short-range deterioration in the construction areas. Grading operations and the transportation and handling of materials such as earth and aggregates will result in the release of airborne dust. The burning of clearing and grubbing wastes will also contribute to the particulate and pollutant loads in the atmosphere, although such conditions would be infrequent and of relatively short duration. Emissions from construction machinery will add to the motor vehicle classes of air pollution.

Contractors involved with the construction will be required to comply with the Iowa Rules and Regulations Relating to Air Pollution Control. Specifically, adherence to requirements for open burning fugitive dust, visible emissions, and permits will be required in the construction contracts in an effort to minimize the short-range effects upon air quality within the project corridor.

Temporary deterioration of surface water quality may result from grading, bridge construction, and other construction acitivites. Increased turbidity and siltation, caused by erosion or exposed land and disturbance of the stream beds, will be the greatest construction impact on water quality. Runoff from disturbed areas may also increase the levels of metals, pesticides, and nutrients in the streams, depending on the land use and rainfall at the time of construction. Ground water quality is not expected to be appreciably affected by construction operations.

To reduce impacts on water quality, contractors will be required to minimize the area cleared during any time and will employ erosion control measures at all stages of construction. Such measures may include temporary berms, dikes, siltation basins, drains, gravel, mulches and grasses, and will apply to haul roads and borrow sites as well as the permanent right-of-way. Sanitary facilities will be required at the construction sites. Suitable storage areas and careful handling of potentially harmful materials will be required by the contractor.

Traffic patterns and existing access points near the proposed facilities will be affected by construction activities. Construction schedules will be coordinated in advance to minimize the effects of such disruption. Suitable detours will be required to maintain local traffic circulation, and areas to be disturbed up at any time can be controlled to limit the extent of disruption. Contractors will be required to maintain access within a specified distance of any inhabited areas to assure continued fire protection and emergency services.

Impact of Earth Borrow

Construction of Relocated U.S. 20 will require earth borrow for any of the alternatives investigated.

One possible solution to obtain sizeable quantities of earth is to borrow from one or two sites, and eventually develop the site(s) into a lake (or lakes). Such a concept is designated as "lake-borrow."

This concept could be used as a mitigation factor for project construction by creating an additional wetland environment within the corridor and deeding the site(s) to the appropriate county conservation board for incorporation into the county park system.

Other types of earth borrow may also be selected and implemented during the final design and construction phases of this project. At this early stage of project development however, appropriate soil analysis and other studies to determine borrow sites have not been completed and accordingly locations for potential borrow sites have not been designated. Because the location of borrow is not considered to be a controversial issue on this project, this data will be developed after the alternative selection process and appropriate soil studies have been completed, with tentative borrow sites (as well as any mitigation measures, if any) discussed in the final environmental impact statement.

EXAMPLES OF POTENTIAL MITIGATION, AVOIDANCE, AND MONITORING OPTIONS

Each of the four alternative alignments under study through the greenbelt will affect natural features of the area even though alignment adjustments and bridge design concepts have been incorporated during preliminary project design to minimize such impacts. These effects are expected to be offset (although natural area impacts cannot be completely compensated for) by a miitigation plan to be developed in cooperation with the Iowa DNR and Hardin County Conservation Board. For example, each alignment may result in uneconomic remnants of excess right of way within the greenbelt area creating parcels that could then be conveyed to the local conservation board for use where appropriate. These parcels, if now under cultivation, could be returned to more natural vegetation and used as buffer areas to better protect the existing wooded areas from further agricultural encroachment. If the parcels are now wooded, their public ownership would better assure their preservation. Other greenbelt areas which the local conservation board views as worthy additions to its county-owned system might be appropriate acquisition for mitigation as well. Continued coordination with the Hardin County Conservation Board and Iowa Department of Natural Resources during project development will play a major role in defining appropriate mitigation efforts.

Another example of mitigation would include possible wetland enhancement opportunities. Although major wetland impacts will be avoided by the alignments under study, the need for highway fill material will present an opportunity to create or restore wetland areas on existing agricultural lands. Engineering practice for the design of borrow areas now considers the need to leave shallow areas that allow emergent vegetation and more valuable habitat. Contemporary borrow area design could result in more natural shapes and could include an adequate area of natural ground cover around the water area to provide nesting habitat for waterfowl. The wetland resources within the greenbelt would be expected to improve as a result of the relocated U.S. 20 project if such borrow "wetlands" were incorporated as mitigation. The exact location of borrow areas could be determined during project design and would also consider the desires of the Hardin County Conservation Board.

The previous sections discussed the types of impacts that are expected for this project, such as vegetation loss and animal habitat reduction. In addition to assessing the natural resources of the area, recommendations for possible mitigation were developed as part of the BRD study to lessen the impact of the highway on natural resources in the greenbelt area. These measures could include the avoidance of certain key areas, mitigation to reduce the severity of the impact and long-term monitoring. These measures are discussed in the following paragraphs.

Avoidance

Avoidance of certain key areas in the four corridors is desirable if a feasible and prudent avoidance option is available. These areas include some forest, prairie, savanna and wetland communities that were determined to be of importance to the greenbelt for one or more of the following reasons:

- Rare type of plant community.
- Good-quality plant community.
- Types of plant species present.
- Raptor nesting habitat areas.
- Aquatic habitat.
- Interior forest area.

When feasible, this avoidance option has been incorporated into the preliminary project design, with the result that project impacts to quality natural areas have been reduced. The monitoring function will be used during the final design phase of development to assure the impact reduction effort is carried forward to reduce impacts to any new areas that may be discovered.

Natural Area Acquisition

Because some unavoidable loss of natural area is bound to occur with any of the alternatives, it would be desirable if good-quality natural areas adjacent to the project right-of-way could be purchased and added to the public greenbelt system. This would serve to prevent highway-related development in these areas, provide a buffer area between the highway and the more interior areas of the greenbelt, and add habitat diversity to the greenbelt.

Wetland Replacement

It is not anticipated that any functional wetlands would be impacted by this highway improvement. If a wetland site is located however, appropriate mitigation/restoration action will be included as part of project development. This may require restoration of wetland areas as compensation for such loss. There are many areas in each of the project corridors where wetland restoration would be feasible. There are a number of former wetlands that are now being farmed that could be restored to their original condition. Also, as mentioned earlier, if properly designed, borrow areas may provide wetland restoration areas as well. FHWA policy is to give first consideration to wetland creation in the project right-of-way. In any case, it would be desirable if a buffer area of natural vegetation be included around the wetland to protect it from the surrounding cropland area. Consideration will also be given to placing wetlands adjacent to other natural areas, especially forested areas, already in public ownership.

Prairie Restoration

Landscaping with native prairie species in the project right-of-way through the entire greenbelt area would be desirable regardless of the alternative. This native landscaping would blend with the natural character of the area and help

native landscaping would blend with the natural character of the area and help suppress the weedy exotics that might invade from adjacent areas. It would also reduce or eliminate the need for mowing and herbicides, which might affect adjacent natural areas. Prairie plants that are to be impacted by the project could provide some seeds as well as individual plants that may be transplanted. Also, the other prairie remnants in Hardin County could serve as seed sources to provide the local varieties needed for this area.

Erosion and Sedimentation Control

Because of the steep slopes, ravines and sensitive aquatic areas, erosion control is especially important on this project. These measures will be in place during the time of actual construction of an activity. Also, unprotected, large, cleared areas will not be exposed at any one time, using erosion control measures beyond the ordinary to assure protection of the Iowa River from harmful levels of sedimentation.

Erosion control is especially important adjacent to the Iowa River because of the possible negative effects on the mussel population and fish spawning areas. Special attention during bridge construction in early to late spring will be considered, particularly for Alternative A which has the best fish spawning area. Stream channelization, dredging or other channel modification will be avoided in the project design. Likewise, pier placement in the channel will be avoided.

In association with these measures, a staff biologist will be involved in monitoring possible aquatic effects during bridge construction.

Raptor Monitoring

Adequate information is not available on the impact of human activities adjacent to Cooper's hawk or sharp-shinned hawk nesting areas. Since it is known that some raptor species may abandon their nests if too greatly disturbed, monitoring of these species would be especially desirable during construction. A staff biologist will monitor the Cooper's hawk nesting areas and sharp-shinned hawk nesting areas prior to any spring construction in the area for Alternatives B, C or D. If active nests are found, consideration will be given to reducing or stopping activities during the nesting period. Monitoring of the nests will continue throughout the nesting season.

Access Control

One of the potential negative impacts to this area could be the development of previously inaccessible natural areas for residential or commercial purposes adjacent to the right-of-way. This may potentially have far-reaching impacts on the greenbelt resources. By limiting access from the highway only to areas outside the greenbelt, such development could be controlled.

Monitor Effects on Adjacent Natural Areas

A monitoring program to assess the impacts to the publicly owned part of the greenbelt, in cooperation with the Hardin County Conservation Board and the Iowa Natural Heritage Foundation will be considered as part of mitigation efforts. This would help to detect any potential major impacts before they become a problem and also provide information useful for future highway impact evaluation in Iowa.

Reduction of Deer-Vehicle Accidents

Several feasible mitigating measures exist for reducing the number of deer-vehicle accidents in a high deer population area such as this. The most effective is 10-foot deer fencing, but only if it is properly installed and maintained. Deer seldom, if ever, attempt to jump over such a high fence, but can often enter the right-of-way by going underneath it where there are small gaps because of topographic contours or erosion (Feldhamer, et al., 1986). Such fencing is only effective on limited access portions of highways, as any openings at intersections would make the fencing ineffective (Feldhamer, et al., 1986).

The fencing should tie into culverts and bridges which deer can use to cross under the highway to feeding/bedding areas. Culverts need to be large enough for deer to be able to see through to the other side (Dr. E. D. Bellis, personal communication). Lee Gladfelter, Iowa DNR biologist, has reported that deer refuse to enter openings that are eight feet wide or less.

Fewer road kills of deer probably would result if deer could leave the road right-of-way more easily after entering it. One-way deer gates (Reed, et al., 1974) should be installed along the fence for this purpose. Such fences are currently being used in conjunction with 10-foot fencing along Relocated U.S. 218 adjacent to George Wyth State Park in Waterloo, Iowa, and appear to be effective.

Options other than deer fencing, such as warning reflectors along the roadside will also be considered. This strategy, which has been successful in other states, would have less effect on roadside aesthetics than deer fences.

Another recommended way to reduce deer kills is to minimize the amount of de-icing salt used on the highway such that highway deicing is accomplished without attracting deer to the highway by overuse of salts (Feldhamer, et al., 1986). Likewise, any artificial sources of salt will be placed away from the highway area.

Initial Four-Lane Construction

Because intrusion into the greenbelt area (as defined by the Greenbelt Masterplan) appears to be a virtual certainty regardless of the alternative selected, it would be desirable if four-lane construction be completed through the most environmentally sensitive segments (perhaps through Hardin County) during the initial phased construction, rather than using the phased four-lane

construction planned for the project. The rationale behind this recommendation reflects the feeling of the project biologist that less damage would be done to the greenbelt if the construction process were limited to one occurrence rather than two separate actions. This would tend to limit construction disturbance to a single event and would allow local officials and greenbelt committee members to make restoration and development decisions based on known conditions.

The final point concerns continuing coordination during the construction phase through the Iowa River valley. In this regard, it is proposed that throughout the location study phase and design of the project, periodic reviews with staff from the Iowa Department of Natural Resources and Hardin County Conservation Board be maintained to provide review and input of roadway features pertinent to preservation of the natural resources of the area.

COMMENTS AND COORDINATION

Over the twenty plus years of development, this project has been the subject of review and comment by dozens of federal, state, and local agencies and interested citizens. Most recently, beginning with the pre-location study published in July of 1987, the early coordination and scoping process was begun anew, to again seek input and advise interested parties that planning was underway to modernize U.S. Highway 20 through Hardin and Grundy Counties.

This early coordination/scoping process has involved publication and distribution of the pre-location study in mid-1987, a document that was intended to reestablish project studies. This report detailed 13 potential alignments for a relocation of Highway 20, which included the four original EIS alternatives. Publication of the pre-location study was followed by two public information meetings in Hardin and Grundy Counties to receive input from elected representatives and interested citizens. This was supplemented by additional meetings with both local officials and interested members of the public to keep all interested persons aware of project progress and development. Additionally, an Iowa intergovernmental review system letter of intent was forwarded to state agencies to formally advise them that work was underway on this project. Similar early coordination letters were forwarded to appropriate federal agencies as well as area clearinghouses.

One additional method used to keep area residents apprised of project developments was a U.S. 20 newsletter, which was forwarded to over 300 area residents including local and regional elected officials, media, environmental organizations, property owners, and others who had expressed interest in the project.

The results of this effort has been a continuous involvement in the development and decision making process by those persons most affected by the project. This has resulted in additional study alternatives or modifications to alternatives which were evaluated and in some cases incorporated into the proposed construction alternatives.

Key issues established through the early coordination and scoping process were as follows:

* Economic development impacts.
* Protection of the natural environment.
* Preservation of farmland.
* Assuring modernization of U.S. 20 within the study corridor.

These issues and concerns have subsequently been addressed in the environmental impact statement within specific design alternatives developed to meet unique conditions that exist with the study corridor.

A partial listing of participating early coordination agencies as well as other groups who have been involved in the planning for this project is as follows:

U.S. Department of Interior

Federal Emergency Management Agency

U.S. Army Corps of Engineers

U.S. Department of Health and Human Services

U.S. Department of Agriculture (Soil Conservation Service)

U.S. Geological Service

U.S. Fish and Wildlife Service

Hardin County Conservation Board

Iowa Natural Heritage Foundation

Waterloo Chamber of Commerce

Iowa Falls Chamber of Commerce

Eldora Chamber of Commerce

Hardin County Attorney

Hardin County Zoning

Hardin County Land Preservation and Use Commission

Iowa Falls Worker Drop-In Center

Hardin County Engineer

Grundy County Engineer

City of Conrad Development Committee

Iowa State Historic Preservation Office

Iowa Department of Economic Development

Iowa Department of Natural Resources

Iowa Region Six Planning Commission

Iowa Northland Regional Council of Governments

Hardin County Board of Supervisors

Grundy County Board of Supervisors

Iowa Chapter Sierra Club

Hampton Area Chamber of Commerce

Eldora Industrial Development Commission

Waterloo Industrial Development Commission

City of Waterloo

City of Cedar Falls

City of Ackley

City of Wellsburg

City of Eldora

City of Dike

City of Iowa Falls

Citizens of Ackley, Allison, Alden, Applington, Dumont, Hampton, New Hartford, and Parkersburg (through petition).

The Honorable Robert Fuller, State Representative.

School Districts:

Ackley-Geneva	Iowa Falls	Steamboat Rock
Hubbard	Wellsburg	Parkersburg
Dike	Applington	Grundy Center
Reinbeck	Eldora-New Providence	

Iowa Farm Bureau Federation

Hardin County Farm Bureau

EARLY COORDINATION

COMMENT LETTERS

Steven J. Holcomb, P.E.
County Engineer

Merv Stensland, C.E.T.
Assistant to the Engineer

OFFICE OF

GRUNDY COUNTY ENGINEER

COURTHOUSE

GRUNDY CENTER, IOWA 50638

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Gloria Miller
Office Manager

Steve Thomassen, S.E.T.
Technician

April 11, 1990

Mr. Stephen Larson
Iowa Department of Transportation
Office of Project Planning
Planning and Research Division
800 Lincoln Way
Ames, Iowa 50010

Re: Relocated US 20/Grundy County

DeaR Mr. Larson:

In accordance with your letter dated March 27, 1990, I have reviewed the project map and find no known hazardous waste sites in or near the relocated US 20 corridor.

The proposed improvement is consistent with the county comprehensive transportation plan.

Should you have any other questions please give me a call.

Sincerely,

Steven J. Holcomb

Steven J. Holcomb, P.E.
Grundy County Engineer

SJH:gm

United States Department of Agriculture

Soil Conservation Service

210 Walnut Street
693 Federal Building
Des Moines, IA 50309

February 12, 1990

Received

FEB 14 1990

Office of
Project Planning

Mr. Harry S. Budd
Director
Office of Project Planning
Planning and Research Division
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010

Dear Mr. Budd:

We recently received and reviewed your information describing proposed relocation of U.S. 20 in Hardin and Grundy Counties, Iowa.

During your planning efforts, we would urge your consideraton of potential disruption of prime farmlands, wetlands, and agricultural drainage systems including terraces, waterways, and underground tile.

The local Soil and Water Conservation District in each respective county would be happy to assist you with any soil site problems.

Sincerely,

J. Michael Nethery

J. Michael Nethery
State Conservationist

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

January 17, 1990

Stephen Larson
Office of Project Planning
Planning & Research Division
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Larson:

This letter is in response to your letter of January 9, 1990, in which you requested information on hazardous waste sites in or near the study corridor for the proposed U.S Highway 20 in Hardin and Grundy Counties.

Three known CERCLA sites are noted on the enclosed map. The Hardin County Landfill is located 1/2 mile east and 3/4 mile north of Highway 35 and D41. The Iowa Falls Coal Gasification site is located at 416 Rocksylvania Avenue in Iowa Falls. The third site is Hubbard Train Depot located in Hubbard, north of the grain elevator. There are no known CERCLA sites in Grundy County.

The Iowa RCRA sites are currently being regulated by Region VII of the U.S. Environmental Protection Agency (EPA) in Kansas City, Kansas. We do not have information regarding the location of RCRA sites. This information can be obtained from Mr. Craig Smith, U.S. Environmental Protection Agency, Region VII, 726 Minnesota Avenue, Kansas City, Kansas 66101. The RCRA telephone number is 913/236-2887.

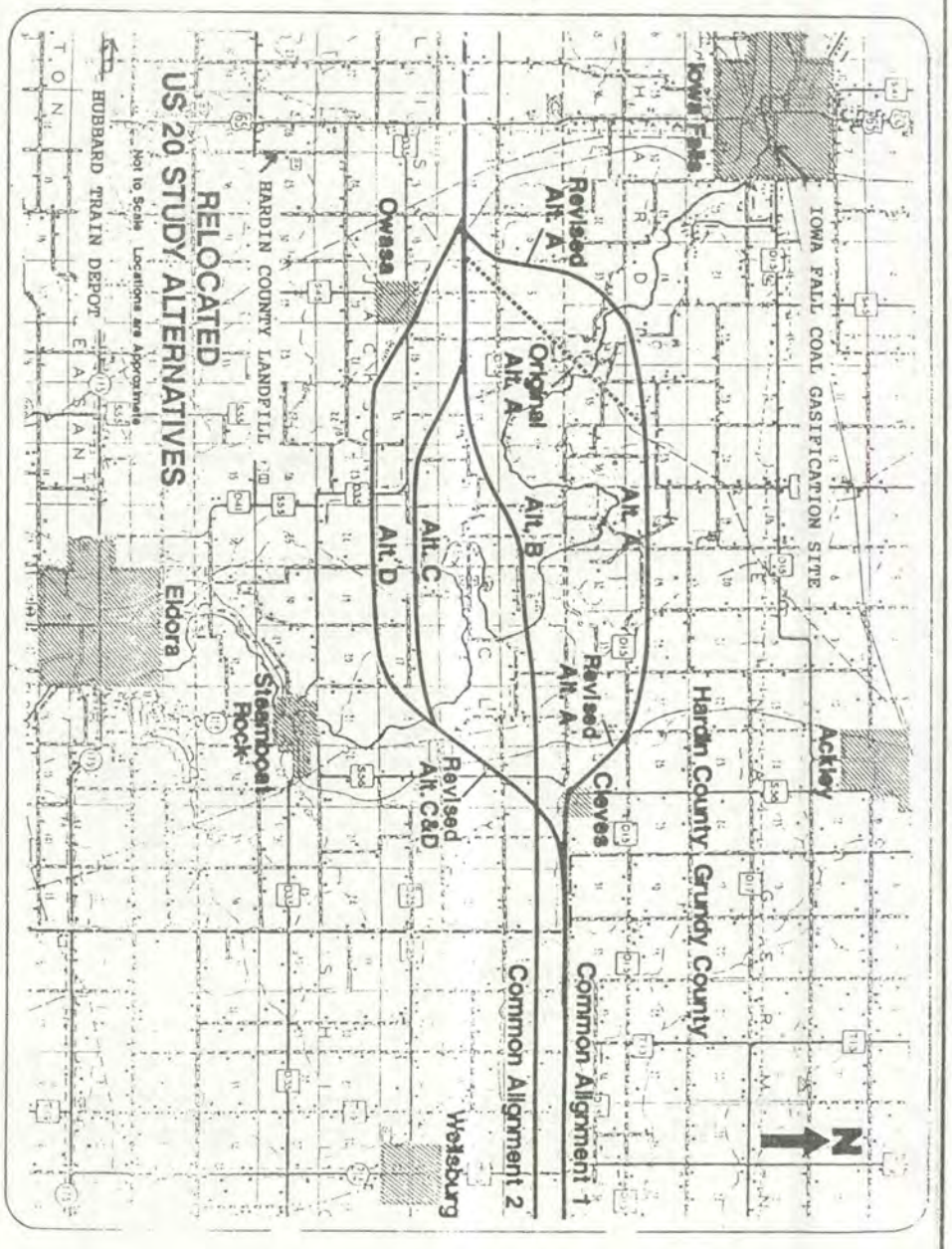
If you need additional information or have any questions, please contact me at 515/281-8852.

Sincerely,

Pete R. Hamlin
Chief, Air Quality & Solid Waste Protection
Environmental Protection Division

ATTACHMENT

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319 / 515-281-5145 / TDD 515-242-5967 / FAX 515-281-889



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

January 19, 1990

Mr. Harry S. Budd, Director
Office of Project Planning
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Budd:

RE: Early Coordination Processing for Highway 20 (F-20-5)

Thank you for your letter of January 8. We have looked at the project map and provide the following comments:

The alternate routes as detailed on the map you supplied appear to have the potential of impacting the flood plain and associated riparian values of the Iowa River. We suggest that you select a route that uses existing road right-of-way (county or state). Alternate Route "A" appears to have the least impact on the river and flow-way.

Please keep us informed of the project development and status. If you have any questions please write to me or call Mr. Dewayne Knott at (913) 236-2823. Thank you for the opportunity to comment.

Sincerely,

Lawrence M. Cavin

Lawrence M. Cavin, Chief
Environmental Review and
Coordination Section

City of Dike

Phone: (319) 989-2291
P. O. Box 160
Dike, Iowa 50624

March 14, 1990

Mr. Tom Welch
Office of Project Planning
Iowa DOT
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Welch,

The Dike City Council, at the regular Council meeting on March 13, 1990, was unanimously in support of the continued development for the Relocated U.S. 20 Project in Grundy and Hardin Counties.

It was further recommended consideration to the prompt efficient construction schedule in Grundy County to Iowa 14.

Please feel free to contact me if any further information is needed.

Sincerely,

Agnes Biersner

Agnes Biersner
City Clerk

IOWA NORTHLAND REGIONAL COUNCIL OF GOVERNMENTS
531 Commercial Suite 800 Waterloo, Iowa 50701-5442 Telephone: 319-235-0311

February 15, 1990

Mr. Tom Welch
Office of Project Planning
Iowa DOT
800 Lincoln Way
Ames, Iowa 50010

Dear Tom,

This is in response to your request for review and comment on the letter of Intent for Relocated U.S. 20 in Grundy and Hardin Counties. Further, this is to inform you that the INRCOG Council acted at their meeting on February 15, 1990 to support the continued development of this project based upon a four-lane freeway concept on new alignment.

The alignment for the proposed U.S. 20 study corridor in Grundy County is consistent with regional and county comprehensive plans and with community plans for Dike and Wellsburg. The freeway concept is also consistent with previous position statements made by the Black Hawk Metro Transportation Policy Board which was re-affirmed at their January 18, 1990 meeting.

I appreciate your thorough presentation of the proposed U.S. 20 project to Grundy County supervisors and community representatives on January 25th. Our review of the project corridor at that meeting indicates that only minor drainage ways are affected in Grundy County and no adverse impacts will occur on 100 year flood plains. We understand that there will be opportunities for local review as the project design progresses, particularly for review of separation and access locations.

Finally, we recommend consideration of an expeditious construction schedule in Grundy County with special consideration of the segment between Black Hawk County and Iowa 14.

Please feel free to contact me if you need any further information regarding this project.

Sincerely,

Rod Larsen

Rod Larsen
Transportation Director

RL:sk

cc: Mr. Don Schildroth
Grundy County Supervisor Chairman
Mr. Ken Cordes
Mayor of Wellsburg
Mr. Don Knudsen
Mayor of Dike
Ms. Sharon Juon
INRCOG Executive Director

DIKE COMMUNITY SCHOOLS
PROGRESSIVE AND PROUD

330 Main Street · Dike, Iowa 50624
SUPERINTENDENT 319/989-2552 · SECONDARY 989-2485 · ELEMENTARY 989-2487

February 14, 1990

Mr. Stephen Larson
Office of Project Planning
Planning & Research Division
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Larson:

Enclosed are two copies of maps outlining the Dike Community School District. I greatly appreciate the opportunity for input and also being continually informed/updated on the status of the project.

My reaction to your proposed route from the school district point of view is most positive. I encourage development and construction of the project as soon as possible to eliminate the heavy auto and truck traffic on the present single lane route. Our buses and students are presently "at risk" because of the amount of traffic on present U.S. 20 and the continuous ignoring of traffic signs, especially through and to the east of Dike. We frequently observe or experience vehicles passing/traveling in no-passing/traveling zones and ignoring our bus lights and signals while picking up and discharging students living on U.S. 20.

My brief analysis of the proposed route reflects three concerns:

First, at the location identified in green (1), a no-entry/overpass/underpass would necessitate our transportation vehicles backtracking 3 miles each of three times daily (AM, Noon and PM). The same would be true for residents living in the area and traveling to and from Dike. If construction to be effected will be similar to U.S. 20 between Webster City and Fort Dodge, an entry with stop sign at the location will eliminate the concern.

Mr. Stephen Larson
Office of Project Planning
Iowa Department of Transportation
February 14, 1990

Second, at location (2) which experiences a reasonable amount of traffic from southeast of Dike, a solution might be for a by-pass road (1/2 mile) between T55 and 7th Street.

Third, the area marked (3) near the west end of the district would necessitate backtracking 2 miles each trip or 6 miles per day. School bus routes would be the primary beneficiary of any provision at this location.

Please note that the above comments are rendered from 13 years of observation and school transportation patterns in the community and district.

Sincerely,

D. M. Gunderson

Don M. Gunderson
Superintendent

DMG:jcc

Enclosure

Eldora-New Providence Community Schools

Eldora, Iowa 50627

Eldora:
Superintendent's Of
858-5631
High School Princi
858-3421
Elementary Scho
858-3421
New Providence
Middle School
497-5201

February 12, 1990

Stephen Larson
Office of Project Planning
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Larson:

Thank you for the opportunity to express our concerns about the relocation of U.S. Highway 20. The Eldora-New Providence Board of Education would like to go on record as supporting the most southern route Alternative D. Alternative D would go through some of our District but we feel that it will not create any problems on our bus routes and the advantages to our District and communities and to the environment far outweighs any inconvenience the new route might create.

Again, "thanks" for allowing us imput into this project and if any more information is needed, please contact us at any time.

Yours truly,

Ingvert Appel

Ingvert Appel
Superintendent

WELLSBURG COMMUNITY SCHOOL

609 S. Monroe Wellsburg, Iowa 50680

February 22, 1990

Stephen Larson
Office of Project Planning
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010

Dear Mr. Larson:

The Relocated U.S. 20 Project was discussed with both the Wellsburg and Steamboat Rock Boards of Education.

Both felt that if the interchanges/separations were located as projected on the proposal, no major impact on bus routes would occur. Of the "alternates" which penetrate the Steamboat Rock District, alternate "B" was perceived as having the least impact.

Both boards of education were unanimous in their request for this project to move forward as quickly as possible.

Sincerely,

Neil OKones Jr.

Neil OKones, Jr.
Superintendent of Schools

Enc: District Maps

Superintendent of Schools 515-869-3732 | Secondary Principal 515-869-5121 | Elementary Principal 515-869-3816

BOARD OF EDUCATION
Douglas Timmons, *President*
Jane Bangasser, *Vice President*
Norma Johnson, *Secretary*
Patricia Meyer, *Treasurer*
Timothy Diehl
Leon Lindsay
Gary Oelmann

ACKLEY-GENEVA COMMUNITY SCHOOLS
ACKLEY, IOWA 50601 - PHONE 515-847-2611

ADMINISTRATION
Kirk Nelson, *Superintendent*
Robert Clifton, *Secondary Principal*
Wayne Slack, *Elementary Principal*

February 12, 1990

Mr. Steven Larson
Office of Project Planning
Planning & Research Division
Iowa Department of Transportation
Ames, Iowa

Dear Mr. Larson:

I am in receipt of your letter regarding the proposed plans for the relocation of Hwy. U.S. 20. My response to the proposed plan would of course be based on current conditions with regard to the Ackley-Geneva School District.

As of now, Alternative Route A as proposed would impact on the Ackley-Geneva Community School District. Your planning would impose travel restrictions for four or five families who currently attend our school. Those families most effected would come from the immediate area around Cleves.

At the current time, there is a strong push for increased sharing between schools which will most certainly lead to eventual consolidations. I see these changes as a reality within the next three to five years.

Please accept an outdated school district map for use in further studies. The map boundaries are accurate although other map information is subject to change from month to month.

We look forward to further involvement and additional information as the project moves along. Please feel free to contact my office if the need aries.

Sincerely,

Kirk Nelson, Superintendent
Ackley-Geneva Community Schools
Ackley, IA

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING—P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO ATTENTION OF:

February 2, 1990

Planning Division

Mr. Harry S. Budd, Director
Office of Project Planning
Planning & Research Division
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Budd:

I am writing in response to your letter dated January 8, 1990, concerning improvements to U.S. 20 from U.S. 65 to the Grundy/Blackhawk County line.

Rock Island District staff have reviewed your proposal and we have the following comments:

a. No Corps of Engineers administered land is involved. Therefore, no further Corps real estate coordination is necessary.

b. Department of the Army (DA) authorization will be required for any proposed placement of fill or dredged material into waters of the United States (including wetlands). When detailed plans are available, please complete and submit the enclosed application to the Rock Island District for processing.

We would appreciate a copy of the Environmental Impact Statement upon completion. No environmental, cultural, engineering, or floodplain management concerns surfaced during our review at this time. Thank you for the opportunity to comment on your proposal.

Sincerely,

Mark C. Schroeder
for Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure

United States Department of the Interior
FISH AND WILDLIFE SERVICE
ROCK ISLAND FIELD OFFICE (ES)
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

IN REPLY REFER TO:
COM: 309/793-5800
FTS: 386-5800

February 2, 1990

Mr. Harry Budd, Director
Iowa Department of Transportation
Office of Project Planning
Planning and Research Division
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Budd:

This is in response to your letter of January 8, 1990, requesting our agency to comment on the relocation of Highway U.S. 20 in Hardin and Grundy Counties. We conducted a site inspection and reviewed information on the area.

We are providing you with a list of federally endangered and threatened species which may be present in Grundy and Hardin County to facilitate compliance with Section 7(c) of the Endangered Species Act of 1973 as amended.

Classification	Common Name	Scientific Name	Habitat
Endangered	Bald Eagle	Haliaeetus leucocephalus	Wintering

There is no designated critical habitat in the project area. However, bald eagles are known to winter along the Iowa River and have been observed near several of the proposed crossings of the Iowa River by U.S. 20. They typically feed along open, ice free areas, where they perch in large riparian trees. They roost at night in large trees in sheltered areas such as ravines.

We understand that you have initiated a study to assess migrating and wintering bald eagle use of the study area. We would like to review the study results when they become available. At that time we can make a determination as to what further measures will be needed to address potential impacts on bald eagles.

General Description

The study area, with the exception of the Iowa River Valley, is in agricultural crop production or pasture. Most of the wildlife habitat present is associated with streams and drainages.

Typically, wetlands characterized by a dense stand of reed canary grass, or less frequently, a narrow strip of trees and shrubs, are associated with these watercourses.

The Iowa River Valley, due to its very steep terrain, is a mixture of forest, pasture and bottomland crop fields. Upland forests are dominated by oaks, with shagbark hickory, hackberry, basswood and sugar maple occurring less frequently. Paper birch and large-toothed aspen, which typically have a more northerly distribution are also found at some locations. Forested wetlands are primarily found along the Iowa River and are dominated by silver maple, box elder, honey locust and green ash. Wetlands are also present in the up-land area along the Iowa River valley. These are typically small, palustrine emergent wetlands associated with areas classified as forested wetland. The isolated nature of this area, the large amount of public land ownership in the Hardin County Greenbelt and the unique characteristics of the vegetation all contribute to the natural, wildlife and recreational value of this stretch of the Iowa River valley.

Impacts of Alternatives to Wildlife

Alternative A: This alternative crosses the Iowa River at a point where the riparian forest corridor is only 0.1 mile in width. The Iowa River is bordered by forested wetland on the east side and upland forest dominated by oak on the west side. Cropland borders these forested areas. The adjacent riparian corridor is similar. This area would provide habitat for white tailed deer, wild turkey, beaver, wood ducks, various non-game bird species and potentially bald eagles. Habitat loss from a highway crossing at this location would be relatively small. As there are already houses nearby and a bridge crossing less than a mile downstream, disturbance from a crossing at this site would be less than at other crossings.

Alternative A bisects a 7.5-acre woodlot dominated in Section 26 of Hardin Township. This would significantly reduce the wildlife value of this tract of forest for deer, turkey, and resident non-game birds. Besides the actual habitat loss, the value of this corridor for wildlife would be lost.

In Section 30 of Etna Township, the highway corridor passes through a large tract of upland forest on the upper end of a drainage which is contiguous with Iowa River. This extensive tract of forest provides habitat for deer, squirrels, turkey and a wide variety of bird species. Besides the forest actually lost from highway construction, this alternative will effectively isolate 50 acres of upland forest, affecting movement and

resulting in wildlife mortality at the highway crossing. The fragmenting effect of the highway will probably also result in the loss of nesting forest interior bird species such as forest warblers, vireos and thrushes.

In Section 35 of Etna Township, depending on the location, the corridor is aligned parallel and adjacent to South Beaver Creek and its associated wetlands, which are primarily in pasture or reed canary grass. These could be impacted, depending on the exact location of the corridor.

Alternative B

In Sections 4 and 5 of Clay Township, before descending into the Iowa River Valley, the highway corridor passes through a mixture of upland forests and forested wetlands, with scattered small potholes. This forest is presently pastured but it provides habitat for wide variety of wildlife, including wetland species such as wood ducks. It also connects extensive forest tracts to the south and north. Putting the highway through this location would have serious impacts on wildlife movements and those forest interior bird species and raptors which require extensive tracts of forest.

As the corridor descends into the Iowa River Valley, it cuts through another tract of forest along the bluffs, traverses the pastured floodplain, a portion of which is wetland, and then cuts through another tract of forest. Upland forest in this area is characterized by a wide variety of tree species, such as red and white oak, shagbark hickory, hackberry, basswood, sugar maple and includes trees of more northern affinities such as paper birch and large-toothed aspen. Bottomland forest is characterized by box elder, green ash, silver maple and honey locust. The isolation of this site and the tracts of forest present make this a prime area for wildlife of all types, but it would be particularly valuable for raptors such as bald eagles and Cooper's and sharp-shinned hawks, which are not tolerant of disturbance and require large tracts of forested habitat. Passage of the highway corridor through this site would destroy the isolated nature of this area, as well as creating a barrier to wildlife movement. The corridor would also pass near the Mann Wilderness segment of the Hardin County Greenbelt and the highway noise would negatively impact the "wilderness" characteristics for which it was named.

This corridor will also impact 3 small woodlots of 3-10 acres in the western part of the corridor. This will result in the loss of habitat primarily for squirrels, raccoons and resident bird species.

Alternative C

In Section 13 of Jackson Township, the corridor passes through a pastured bur oak woodland with three wetlands of 1-2 acres in size. These wetlands are seasonal, but have value for waterfowl, herons and amphibians. The woodland provides habitat for deer, turkeys, squirrels and various songbirds. All of the wetlands will be lost and the value of the woodland will decrease significantly if the highway is constructed through this site.

In Section 16 of Clay Township, the corridor descends into the Iowa River valley. It will cross a heavily wooded drainage and a forested wetland dominated by large silver maple before ascending the bluffs through a forested corridor 500 feet wide. The corridor will also pass through or directly next to the Leverton Timber segment of the Hardin County Greenbelt. The mixture of pasture, forested wetland, upland forest and aquatic habitat provides habitat for a wide variety of wildlife including white-tailed deer, turkey, wood ducks, great blue herons raptors and various songbirds. Bald eagles are known to use this area. The value of this area is largely dependant on its isolation as there are no road crossings of the Iowa River for approximately five miles. There is also a long, contiguous tract of timber connected to the more extensive tracts of timber to the north. The proposed corridor would cut through the middle of this corridor and would negatively impact the value of the area to species dependant on isolation, such as raptors and pileated woodpeckers, disrupt wildlife movements along the riparian corridor and reduce habitat value for those species, particularly forest interior bird species requiring unbroken tracts of forest.

Alternative D

In Section 17 of Jackson County, the proposed alignment would appear to require the relocation of 0.25 miles of Beaver Creek. Beaver Creek at this location is a perennial stream 15 feet wide with an associated forested wetland corridor approximately 100 feet wide. This provides habitat for a pheasants, rabbits and a variety of small mammals and songbirds. Fish species present may include bigmouth shiner, creek chub, central stoneroller and black bullhead.

Alternative D will cross the Iowa River just south of Alternative C and its impacts will be very similar, except that it will not pass through the wooded drainage.

Common Alignment

This portion of the highway corridor will primarily impact wetlands along South Beaver Creek, as the corridor crosses the creek at several locations. Associated wetlands vary in width

from a narrow strip to several hundred feet. The wetlands in some cases are pastured, but at other locations are vegetated with dense stands of reed canary grass. This provides habitat for pheasants and various grassland birds.

We have enclosed aerial photos with Soil Conservation Service wetland mapping determinations. As these are preliminary and the landowners have not yet been notified, this information should be considered confidential at this time. Areas designated as wetlands in crop fields are only considered potential wetlands and they may be classified as converted wetlands when determinations are finalized.

As this project has the potential to affect significantly affect wetlands, as well as a number of wildlife species of concern to our agency, we request that we be keep informed of any changes or decisions regarding project alternatives. If you have any questions, please contact John Grettenberger or Wayne Fisher of my staff at 309/793-5800.

Sincerely,

Richard C. Nelson
Field Supervisor

Enclosures

cc: Doug Janke (IADNR, Hampton)
Darrell Howell (IADNR, Des Moines)

HARDIN COUNTY
BOARD OF SUPERVISORS

515-858-3461

Hardin County Courthouse
Eldora, Iowa 50627

LINN ADAMS
Iowa Falls
515-648-4958

DONALD BALVANZ
Hubbard
515-864-3155

MILLIE LLOYD
Gifford
515-858-3078

October 27, 1987

Tom Welch, P.E.
Office of Project Planning
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Welch:

The Board of Supervisors appreciate the opportunity to comment and provide suggestions on location of U.S. 20 across Hardin County.

The relocation of U.S. 20 in Hardin County has been a controversial issue for many years and will continue to be one. Many studies have been made and we understand still more studies will be made. Is this a wise expenditure of our tax dollars?

We feel the Iowa Department of Transportation has the expertise in making a decision on the location of U.S. 20 based on economic studies, environmental studies and engineering studies. By the Iowa Department of Transportation requesting a corridor be recommended by the Board of Supervisors, the Iowa Department of Transportation is placing the Board in a serious political dilemma. There are many groups in the County putting pressure on the Board of Supervisors and consequently, any decision made would offend various groups. The Board does not have the means to conduct the many studies necessary to make a sound decision.

The final decision on the location of U.S. 20 should not only consider the people of Hardin County, but emphasis should also be placed on people it serves who are traveling from Sioux City to Dubuque.

We are wondering what is happening to other segments of U.S. 20, i.e. from U.S. 65 to Hamilton County, from Fort Dodge west to U.S. 169 and U.S. 20 in Grundy County? Shouldn't these segments also be finalized before U.S. 20 from U.S. 65 to the Grundy County line?

The Board of Supervisors offer the following suggestions as the Iowa Department of Transportation does further and/or additional Environmental Impact Studies on location of U.S. 20. (See enclosed map)

Alternative 2: Section 10 of Jackson Township--relocate route further south to avoid ravine on the Fuller property.

Alternative 2: Section 6 of Clay Township--move route as far north as possible and consider purchase of three homes.

Alternative 4: Relocate to coincide with creek bed.

In conclusion, we feel the decision for the final location of U.S. 20 be with the Iowa Department of Transportation as you certainly have the people capable of making the decision considering the needs of the people of the state of Iowa and also the many serious concerns of the people of Hardin County. We are sure the decision will not be a political decision, but one based on needs, concerns, environmental, economical, and engineering.

Sincerely,

Millie Lloyd

Mildred Lloyd, Chairman
Board of Supervisors

Enclosure

/sk

IOWA FARM BUREAU FEDERATION
5400 University Avenue, West Des Moines, Iowa 50265 / (515) 225-5400

April 10, 1990

Tom Welch
Iowa Department of Transportation
Office of Project Planning
800 Lincoln Way
Ames, Iowa 50010

Dear Tom:

Thanks for providing area farmers and land owners detailed information on the U.S. 20 highway relocation during the March 28 meeting at Steamboat Rock. Response following the meeting has been positive from land owners who appreciated the opportunity to gain better understanding about the project. They also appreciated the chance to talk one-on-one with DOT staff that attended the meeting.

We are submitting the following items for Department of Transportation staff and Commissioners to consider in making a decision on the route for the relocation of U.S. 20.

1. Minimize the use and disturbance of prime agricultural land. Currently, we have an abundant supply of food in the United States. Agriculture currently has the ability to produce more crops that can be used in the market place. However, the welfare of future generations needs to be considered before irrevocable changes are made to Iowa farmland. Predictions that the world population will double soon after the turn of the century will certainly increase food demands dramatically.

2. Consider the inconvenience in disruption that the newly located highway will bring to the families living nearby. A route that minimizes the impact on existing farmsteads should receive preference. And, human concerns should have a priority higher than, or at least equal to, wildlife concerns.

   We understand the effort to minimize disturbance to wildlife habitat by the actual highway construction and the concern for disturbance by traffic noise. However, we know that some species are very adaptable to human activities. Let me point to a specific example that happened in southeast Iowa a few years ago when large herds of deer were coming out of the Iowa Army Ammunition Plant area near Burlington. The deer population had grown so rapidly in the 19,000-acre reservation that they were coming out and completely destroying crops on nearby farm land.

   One farmer told me of the Department of Natural Resource's effort to scare off the deer from cropland by using a combustible noise device. It was equipped with a timer and portable LP tanks and would set off a periodical high decibel explosion similar to firing a gun.

   The farmer told me that in a few days the deer adjusted and still grazed on his property. Perhaps all species are not as adaptable, but specific studies about species should be available. Consideration should be given to families from both emotional and economics due to highway relocations.

3. Diagonal sections of the highway should be kept to a minimum. Coping with point rows on crops are always bothersome and irregularly shaped fields reduce a farmer's efficiency.

4. The economic development of one community versus another should be a low, or non-existing, priority for choosing alternative sites.

We realize the Iowa Department of Transportation has many federal and state laws to guide and direct highway corridor selection. Many of these requirements, rightly so, protect historical sites, certain plants and animals. There is a growing perception in rural areas about a lack of concern for existing farm families. We urge DOT staff and the Department of Transportation Commissioners to be considerate of farm families and their activities when deciding on the new route for Highway 20.

Thanks for the opportunity to comment.

Sincerely,

Jerry Shepler

Jerry Shepler, Director
Local Affairs

lb

A JOINT RESOLUTION EXPRESSING A PREFERENCE FOR THE ROUTING OF RELOCATED U.S. HIGHWAY 20 FROM U.S. HIGHWAY 65 EAST THROUGH HARDIN COUNTY

WHEREAS, the prompt completion of the new U.S Highway 20 Route is essential to the economic well-being of Hardin County; and

WHEREAS, the Iowa Department of Transportation has proposed four alternative routes for relocated U.S. Highway 20 through Hardin County; and

WHEREAS, the swiftest possible completion of this project is of primary concern to the communities of Hardin County; and

WHEREAS, local input to the Iowa Department of Transportation is an important element in the decision making process; now

Therefore BE IT RESOLVED, that proper access to relocated U.S. Highway 20 should be provided to those Hardin County communities that need adequate transportation to preserve and enhance their economic vitality; and

BE IT FURTHER RESOLVED, that the recommendation contained in this resolution may be subject to re-evaluation at such time as the Environmental Impact Study on the proposed relocation alternatives is complete; then

BE IT FINALLY RESOLVED, that the undersigned organizations will endorse any alternative route for U.S. Highway 20 that is located between proposed alternative B and D including these alternatives (see attached map).

9/5/90
Date
H.L. Hammerberg, Mayor
City of Ackley

9/12/90
Date
Wayne Shuger, President
Ackley Industrial
Development Corp.

9-5-90
Date
Glen Boheman, President
Ackley Chamber of
Commerce

Date
A.E. Shepherd, Mayor
City of Eldora

9/7/90
Date
Leon Herndon, President
Eldora Industrial
Development Corp.

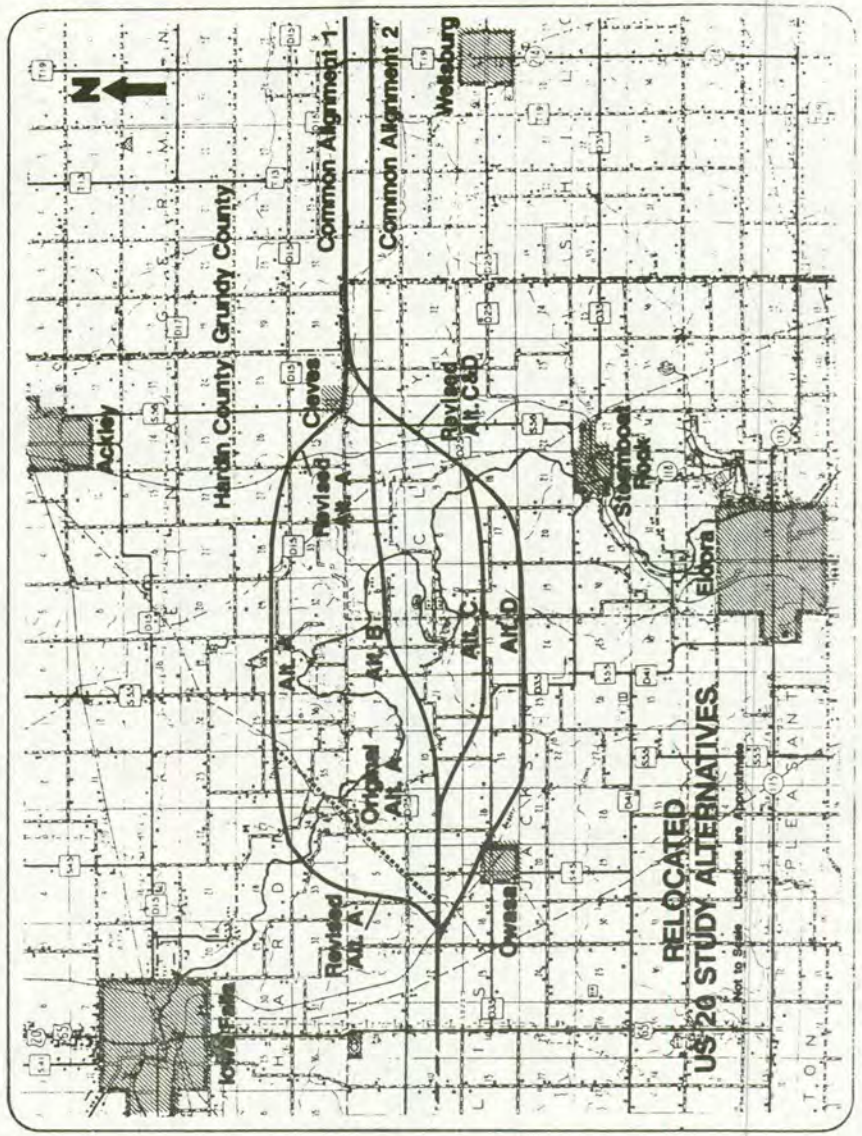
9/4
Date
Fergus Taylor, President
Eldora Chamber of
Commerce

Date
George Vest, Mayor
City of Iowa Falls

9/12/90
Date
Ted Williams, President
Iowa Falls Industrial
Development Corp.

9/12/90
Date
Mike Nissly, President
Iowa Falls Chamber
of Commerce

Date
Millie Lloyd, Chairman
Hardin County Board
of Supervisors



U.S. Department
of Transportation
Federal Highway
Administration

Region 7
Iowa, Kansas
Missouri, Nebraska

Iowa Division
P. O. Box 827
Ames, Iowa 50010

October 3, 1990

Mr. Art Klingerman
Chief of Planning
Rock Island District
U.S. Army Corps of Engineer
Clock Tower Building
Rock Island, IL 61201

Dear Mr. Klingerman:

The Federal Highway Administration (FHWA) in cooperation with the Iowa Department of Transportation (DOT) is initiating environmental impact statements for the following projects:

- Relocated U.S. 20 through Hardin and Grundy Counties. This project is described as a relocation of U.S. Highway 20 using two-lane construction on four-lane right of way over the 40-mile length of the corridor between U.S. 65 and the Black Hawk county line. Early coordination materials for this improvement were forwarded to you by the Iowa DOT on January 8 of this year.

- Upgrading I-235 in Des Moines, Polk County. Work currently underway involves development of alternatives for increasing capacity and/or reducing the traffic demand on I-235 through the city of Des Moines. These alternatives will later be evaluated in a draft environmental impact statement (EIS). At the time EIS work is initiated, appropriate early coordination materials will be forwarded to you.

Since these projects will almost certainly require Section 404 permits, and because of your agency's legal jurisdiction over such permits, we are requesting you to be a cooperating agency.

Your agency's involvement should entail those areas under its jurisdictional expertise and no direct writing or analysis will be necessary for document preparation. The following are activities we will take to maximize interagency cooperation:

1. Invite your agency representative to appropriate meetings.

2. Consult with you on relevant technical studies that will be required for the project.

3. Provide you with project information, including study results.

4. Provide you the opportunity to review pre-draft and pre-final environmental documents and technical studies prior to publication.

5. Encourage your agency to use the documents noted above to express your views on subjects within your jurisdiction or expertise.

6. Include information in the project environmental documents that cooperating agencies need to discharge their National Environmental Policy Act (NEPA) responsibilities and any other requirements regarding jurisdictional approvals or permits.

We look forward to your response to this request and your role as a cooperating agency on this project. If you have any questions, or would like to discuss in more detail the project or our agencies' respective roles and responsibilities during preparation of the EIS's, please contact our office.

Sincerely,

H. A. Willard
Division Administrator

cc:
Mr. Harry Budd, Office of Project Planning, Iowa DOT

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING—P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO ATTENTION OF:
Operations Division

November 7, 1990

Mr. H.D. Willard
Division Administration
U.S. Department of Transportation
Iowa Division
Post Office Box 627
Ames, Iowa 50010

Dear Mr. Willard:

Please reference your letter dated October 3, 1990, requesting the Corps of Engineers to become a cooperating agency for the preparation of environmental impact statements for the relocation of U.S. Route 20 through Hardin and Grundy Counties and the upgrading of Interstate 235 in Polk County, Iowa.

We currently do not have the funding or manpower to participate as a cooperating agency. However, we will review your projects for our regulatory involvement under Section 10 of the Rivers and Harbors Act of 1899 and/or Section 404 of the Clean Water Act. You should also provide a copy of your National Environmental Policy Act (NEPA) documentation to this office so that we may utilize relevant portions of the documents for our NEPA compliance.

Should you have any questions, please contact our Regulatory Functions Branch by letter, or telephone Mr. John Betker, 309/788-6361, extension 6380.

Sincerely,

Raymond Horton P.E.

James H. Blanchar, P.E.
Chief, Operations Division

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

December 17, 1990

Stephen Larson
Office of Project Planning
Planning & Research Division
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

RE; Highway 20 - Hardin & Grundy Counties

Dear Mr. Larson;

This letter is in response to your department's October 19, 1990 letter to Pete Hamlin of our Air Quality and Solid Waste Protection Division regarding the preparation of an environmental impact statement (EIS) for the relocation of Highway 20. We offer the following comments for the items addressed in your letter.

1. Ambient conditions of streams, rivers, or other water bodies within the project. Enclosed we have provided the recent report on water quality in Iowa. This report provides a summary of the water quality of the Iowa River but not of the smaller streams in the area as water quality monitoring data was not routinely gathered on these creeks. Other information contained in the report may be of interest in your preparation of the EIS.

It may also be helpful to note the provisions of Iowa's Water Quality Standards which are applicable within the study area. Only one water body in the corridor has been designated under the new Water Quality Standards, the Iowa River. The river is designated as a Class A, B(WW) and HQR water. Class A is for the protection of primary contact recreation, such as swimming, skiing and water contact canoeing. Class B(WW) is for the protection of Significant Resource warm water aquatic species, primarily sport fisheries. The High Quality Resource (HQR) designation denotes the substantial recreational or ecological significance of the water body because it possesses unusual, outstanding, or unique physical, chemical, or biological

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characteristics which enhance the beneficial uses and warrant special protection.

It is the latter HQR designation which this proposed project may have the greatest affect upon. The roadway corridor and construction activities will likely have an impact on the physical and possibly the biological integrity of the river. This potential impact may be associated with such items as the changes to the bank cover, the possible alterations of the bank alignment, and the extent of fill during and post construction. The departments review of the project under Corps of Engineers Section 404/401 permitting activities and the agency's Section 111 Construction Permit will evaluate the effects of the project on water quality, fisheries and wildlife. Special considerations or mitigation efforts (such as limiting the extent of fill material or rip rap, reducing clear cut areas, or minimizing stream realignment) may be needed to assure a minimum impact to the HQR designation. These considerations or conditions will be developed latter in the project development and may require more information on the route, design specifications and construction techniques.

Other streams along the route, such as North Black Hawk and South Fork of South Beaver Creeks in Grundy County and Beaver Creek in Harden County, are potential candidates for the Class B(LR) Limited Resource designation. This Limited Resource designation is for the protection of aquatic populations associated with smaller, low flow streams typically supporting minnows. The project corridor and its construction activities will likely have a lesser impact on these streams, however our review of the project will still need to be performed following submission of additional data. Some degree of special considerations or mitigation may still be needed on these smaller streams during the Section 404/401 permitting process.

The department has not designated any wetlands along the corridor, however, it is very likely that various types of smaller wetland areas will be crossed. The affected wetlands which fall under the Section 404 provisions will require department review and potential mitigation developed to assure that the water quality standards are met.

2. Possible project impacts to area aquifers. To date, we are unaware of any deep aquifer which may be impacted by the

project. The construction activity may locally influence the shallow alluvial aquifer as would any surface activity. We are referring this request to our Geological Survey Bureau in Iowa City for any comments they may have.

3. Potential for encroachment on wellhead protection areas. The department has not designated any areas for wellhead protection. However, IDOT should contact individual property owners with public water supply systems to determine if they have designated a wellhead protection area.

4. Sole-source aquifers. There are no sole-source aquifers designated in Iowa.

5. Locations of critical aquifer protection areas. There are no critical aquifer protection areas designated in Iowa.

It warrants notation that the abandonment of any active or unused well encountered along the selected route must be completed in accordance with our regulations. These regulations include the methods of abandonment and the reporting of the affected wells.

Please feel free to contact Dennis Alt (515/281-8998) regarding water supplies, Ralph Turkle (515/281-7025) regarding water quality, or myself (515/281-7706) if questions arise.

Sincerely,

Lavoy Haage

Lavoy Haage, Supervisor
Water Quality Planning Section

enclosure

SELECTED

COMMENTS RECEIVED DURING

PRE-LOCATION STUDY DEVELOPMENT

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*

Name Of Project: Relocated U.S. 20
Proposed Land Use: Highway Construction
Date Of Land Evaluation Request:
Federal Agency Involved: Federal Highway Administrati
County And State: Grundy County, Iowa

PART II *(To be completed by SCS)*

Date Request Received By SCS: August 6, 1990

Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply – do not complete additional parts of this form). Yes ☒ No ☐

Acres Irrigated: 0 | Average Farm Size: 308

Major Crop(s): Corn
Farmable Land In Govt. Jurisdiction — Acres: 320,640 % 100
Amount Of Farmland As Defined in FPPA — Acres: 281,200 % 88
Name Of Land Evaluation System Used: Grundy County
Name Of Local Site Assessment System: None
Date Land Evaluation Returned By SCS: December 5, 1990

PART III *(To be completed by Federal Agency)*		Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		953.8			
B. Total Acres To Be Converted Indirectly		--			
C. Total Acres In Site		953.8			
PART IV *(To be completed by SCS)* Land Evaluation Information		953.8			
A. Total Acres Prime And Unique Farmland		0			
B. Total Acres Statewide And Local Important Farmland		.003			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		70			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		80			
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*					
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	10			
3. Percent Of Site Being Farmed	20	20			
4. Protection Provided By State And Local Government	20	20			
5. Distance From Urban Builtup Area	N/A	--			
6. Distance To Urban Support Services	N/A	--			
7. Size Of Present Farm Unit Compared To Average	10	10			
8. Creation Of Nonfarmable Farmland	25	0			
9. Availability Of Farm Support Services	5	5			
10. On-Farm Investments	20	20			
11. Effects Of Conversion On Farm Support Services	25	0			
12. Compatibility With Existing Agricultural Use	10	0			
TOTAL SITE ASSESSMENT POINTS	160	100			
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	80			
Total Site Assessment *(From Part VI above or a local site assessment)*	160	100			
TOTAL POINTS *(Total of above 2 lines)*	260	180			

Site Selected: | Date Of Selection | Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side) Form AD-1006 (10-83)

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*

Name Of Project: Relocated U.S. 20
Proposed Land Use: Highway Construction
Date Of Land Evaluation Request:
Federal Agency Involved: Federal Highway Administrati
County And State: Hardin County, Iowa

PART II *(To be completed by SCS)*

Date Request Received By SCS: Aug 6 1990

Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply – do not complete additional parts of this form). Yes ☒ No ☐

Acres Irrigated: — | Average Farm Size: 320

Major Crop(s): Corn
Farmable Land In Govt. Jurisdiction — Acres: 367,168 % 100
Amount Of Farmland As Defined in FPPA — Acres: 330,000 % 99
Name Of Land Evaluation System Used: Soil Survey of Hardin CO.
Name Of Local Site Assessment System:
Date Land Evaluation Returned By SCS:

PART III *(To be completed by Federal Agency)*		Alternative Site Rating Site A (1)	Site B (2)	Site C (3)	Site D (4)
A. Total Acres To Be Converted Directly		443.2	511.2	555.3	568
B. Total Acres To Be Converted Indirectly		--	--	--	--
C. Total Acres In Site		443.2	511.2	555.3	568
PART IV *(To be completed by SCS)* Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		101.6	113.6	127.0	125.3
B. Total Acres Statewide And Local Important Farmland (Hardin CO prime)		260 000	260 000	260 000	260 000
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		.0016	.0015	.0016	.0016
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		65.3	49.5	47.6	47
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*		73.7	80.2	83.3	84.3
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	15	15	15	15
2. Perimeter In Nonurban Use	10	10	10	10	10
3. Percent Of Site Being Farmed	20	20	20	20	20
4. Protection Provided By State And Local Government	20	20	20	20	20
5. Distance From Urban Builtup Area	N/A	--	--	--	--
6. Distance To Urban Support Services	N/A	--	--	--	--
7. Size Of Present Farm Unit Compared To Average	10	10	10	10	10
8. Creation Of Nonfarmable Farmland	25	10	5	8	8
9. Availability Of Farm Support Services	5	5	5	5	5
10. On-Farm Investments	20	20	20	20	20
11. Effects Of Conversion On Farm Support Services	25	0	0	0	0
12. Compatibility With Existing Agricultural Use	10	1	1	1	1
TOTAL SITE ASSESSMENT POINTS	160	111	106	108	108
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	73.7	80.2	83.3	84.3
Total Site Assessment *(From Part VI above or a local site assessment)*	160	111	106	108	108
TOTAL POINTS *(Total of above 2 lines)*	260	184.7	186.2	191.3	192.3

Site Selected: | Date Of Selection | Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side) Form AD-1006 (10-8

RESOLUTION

WHEREAS: The Iowa Department of Transportation has requested input on the future location of U.S. 20 in Grundy County, and

WHEREAS: The location of U.S. 20 will have a substantial impact on roads constructed and maintained by the Grundy County Highway Department, and

WHEREAS: The Grundy County Board of Supervisors have discussed this issue at length with many constituents and amongst themselves at a public Board meeting,

NOW, THEREFORE, BE IT RESOLVED, that the Grundy County Board of Supervisors go on record as supporting Common Alignment 1 in Grundy County, to be constructed as an Expressway.

Benefits of this route are as follows:

1) Utilizes existing east-west U.S. 20.
2) Utilizes 10 miles of existing Grundy County gravel roads.
3) Provides 12 miles of paved road in an area of Grundy County not currently served by a paved road.
4) Expressway addresses the needs of Grundy County farmers who must conduct their business along this road.
5) Requires minimal diagonal routes which the Grundy County Board of Supervisors oppose except for very short distances.
6) Allows for a compromise of the Greenbelt problem with the hookup to 10 possible routes thru or around the Greenbelt.
7) Vehicle operating costs will be low along this relatively straight route for the thousands of people who drive this road daily.
8) Cities north and south of this route will all have an equal opportunity for business development.

Passed and Approved this 8th day of September 1987.

Bernard K. Eilderts, Vice-Chairman
Grundy County Board of Supervisors

ATTEST: Jake Hemmen
Jake Hemmen
Grundy County Auditor

March 29, 1988
Ames, IA

DOT STAFF & COMMISSIONERS

The Hardin County Board of Supervisors thank you for this opportunity to comment on the relocation of U.S. Highway 20 across Hardin County, a controversial issue for many years.

It is inevitable the relocation of Highway 20 will be constructed. Since this is the missing link in the highway corridor we encourage the project to be pursued without further delay.

We feel some traffic on county roads would be eleviated if the freeway were constructed. A freeway would provide a free flowing highway corridor to improve safety and increase efficeincy in distribution of products. It could also further business interest in communities and enhance industrial development.

With only 2-3% projected difference in project costs in alternatives one through five, it doesn't appear that cost is a significant factor.

It is our understanding the commissioners have received recommendations of DOT engineering staff to further study Routes 1A, 2, 4, and 6.

In previous comments to the DOT and board discussions routes 2, 4, and 6 have been prefered. The general populous of Hardin County have made comments supporting these routes. People are interested in various routes for personal reasons and interests.

Alternative 2 appears to be the most direct route. The board previously suggested Alternative 2 be relocated further south and east before making diagonal severance to avoid a deep ravine in Section 10, Jackson Township. In Clay Township, Section 6, the board suggested the route be moved as far north as possible and consider purchasing the three homes in that area. This route has considerably less severance than other routes.

On alternative 4 the board suggested the route be relocated to coincide with a creek bed thus creating less diagonal severance through farmland. Mileage varies little between Alternatives 2 and 4.

Route 6 could utilize railroad right of way where diagonal severance already exists. The route would have more level land than other routes. This is a longer route and has more diagonal severance.

In analyzing the effects of the relocation of U.S. 20 on our County road system, it varies little between Routes 2, 4, and 6 in our opinion.

Of the four routes proposed for further study, the Board would prefer Routes 2 & 4 with 1A and 6 less desirable.

The relocation of U.S. 20 would affect Hardin County if we have to be responsible for taking over and maintaining Old 20. The improvement of U.S. 20 across Iowa would be a definite benefit for the State of Iowa, more than just a benefit to the people of Hardin County. If the County has to assume maintenance of Old 20 this will be a definite hardship to the tax payers of Hardin County. This rule should be reanalyzed and studied for a possible change.

In conclusion, we feel the decision for the final relocation of U.S. 20 should consider the concerns and needs of the people of Hardin County and the State of Iowa and consideration should be given to what is the most feasible and economical.

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

September 28, 1987

Mr. Thomas M. Welch, P.E.
Office of Project Planning
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010

Dear Mr. Welch:

We appreciate the opportunity to review and provide responses to the "Pre-Location Study of US-20 in Hardin and Grundy Counties." Obviously if there were an easy solution to the location of this highway, it would have been resolved and constructed long ago.

Earlier planning and assessment efforts in the 1970's and inputs to the IDOT's Pre-Location Study have made it very clear that intense and well- founded opposition exists for any route which plunges straight through the very center of the Iowa River Greenbelt. This agency felt that Alternatives 2, 2A and 3 were unacceptable in the 1970's, and that they are still unacceptable today.

Rather than single out a specific route as being favored by the DNR, we have grouped the remaining alternatives into two classes. They are as follows:

PREFERRED ALTERNATIVES	LESS DESIRABLE ALTERNATIVES
1B	1C
1B(Modified)*	7
6	7A
6A	4
8	5

*The "1B-Modified" route as sketched on the enclosed map follows the 1C route for 2-3 miles west of Robertson to provide a narrow buffer zone between the highway and the dense timber to the south.

These groupings are based on evaluations conducted by DNR biologists, considering such things as existing fishery resources, existing wildlife resources and associated habitats, timber resources, deer movement routes, archaeological resources and aesthetics of the Greenbelt. Additional surveys regarding threatened and endangered species have been suggested to the

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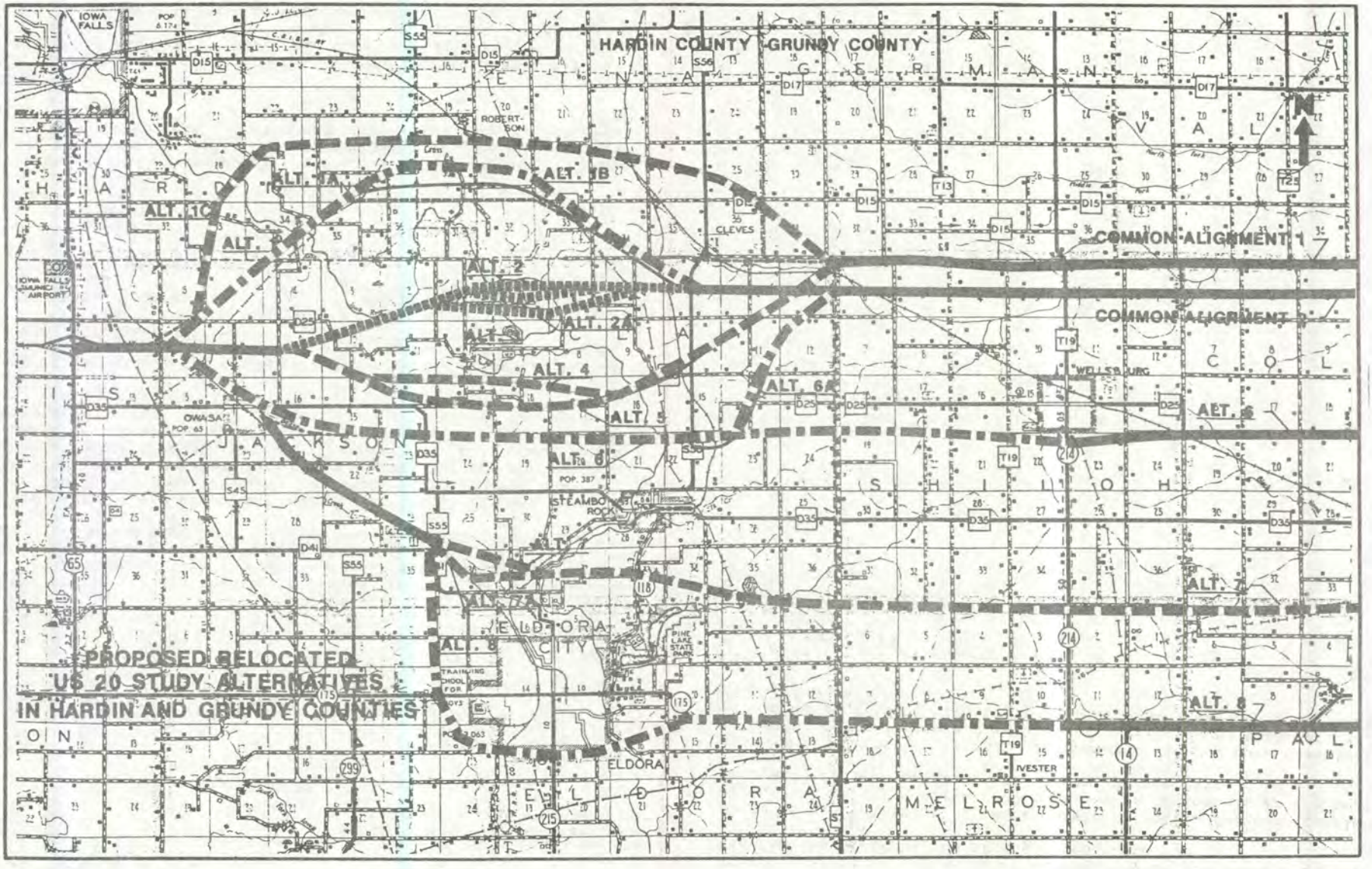
IDOT; and findings from those surveys may affect the DNR's position on the desirability of any given route.

While we are cognizant of the economic rationale for not considering the existing Highway 20 route as an option, it is the most desirable from an environmental impact perspective.

Thank-you for this opportunity to comment. If you have questions regarding our grouping and ranking of pre-location alternatives, please direct them to Arnie Sohn, Planning Bureau Chief, IDNR (515,281-5814).

Sincerely,

Larry J. Wilson
Director


HARDIN COUNTY
GRUNDY COUNTY
IOWA FALLS
ROBERTSON
CLEVES
ALT. 1A
ALT. 1B
ALT. 1C
ALT. 1
ALT. 2
ALT. 2A
ALT. 3
ALT. 4
ALT. 5
ALT. 6
ALT. 6A
ALT. 7
ALT. 7A
ALT. 8
COMMON ALIGNMENT 1
COMMON ALIGNMENT 2
ALT. 8
IOWA FALLS (MUNICI AIRPORT)
OWASA
POP. 65
POP. 387
STEAMBOAT ROCK
ELDORA
ELDORA CITY
PINE LAKE STATE PARK
TRAINING SCHOOL FOR BOYS
POP. 2,063
WELLSBURG
IVESTER
MELROSE
PROPOSED RELOCATED US 20 STUDY ALTERNATIVES IN HARDIN AND GRUNDY COUNTIES
PREFERRED
LESS DESIRABLE
UNACCEPTABLE

LIST OF PREPARERS

Iowa Department of Transportation:
- Harry S. Budd, Director, Office of Project Planning
- Thomas Welch, Deputy Director, Office of Project Planning
- Ronald Ridnour, Environmental Specialist
- Donald Keller, Location Planner
- William Pusateri, Environmental Specialist
- Martin Sankey, Location Engineer
- Randall Faber, Historic Preservation Specialist
- Stephen Larson, Program Planner

Federal Highway Administration:
- David Gibbs, Program Development Engineer
- James Hogan, Area Project Engineer
- Kenneth W. Bechtel, Environmental Specialist
- Leland Dong, Highway Engineer

LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE EIS ARE SENT:

A copy of the Draft Environmental Impact Statement was forwarded to the following agencies and individuals for review and comment:

Federal Agencies:

- Department of Agriculture
- Department of Interior
- Environmental Protection Agency
- Department of Health and Human Services
- Army Corps of Engineers
- Federal Emergency Mangement Agency
- Geological Service
- Fish and Wildlife Service

State Agencies:

- Iowa Department of Natural Resources
- Iowa Department of Economic Development
- State Historic Preservation Officer

Local Agencies:

- Grundy County Board of Supervisors
- Hardin County Board of Supervisors
- Iowa Region Six Planning Commission
- Iowa Northland Regional Council of Governments
- Iowa Farm Bureau Federation
- Hardin County Farm Bureau
- Hardin County Conservation Commission
- Grundy County Conservation Commission
- Grundy County Farm Bureau
- Area School Districts
- Hardin County Engineer
- Grundy County Engineer
- Cities of:
  - Ackley
  - Wellsburg
  - Eldora
  - Dike
  - Iowa Falls
  - Steamboat Rock
  - Grundy Center
  - Applington
  - Parkersburg
  - Holland
  - Alden

Organizations, Individuals

- Iowa Natural Heritage Foundation
- Iowa Chapter Sierra Club

Appendix 1

Selected Alternative Comparison Tables

ALTERNATIVE COMPARISON TABLE

Anticipated Impacts
By Natural Resource

Most Desirable

Most Impacts Least Impacts

Least Desirable

Intrusion Through Priority Greenbelt Areas	Prairie	Quality Forested Areas	Wetlands	Nesting Protected Raptor Species	Wintering Bald Eagle Sites	Quality Animal Habitat	Unique Plant Communities	Fishery Resource	Mussel Habitat	Publicly Owned Natural Areas	Fragmentation of Interior Forest
D	B	D	B	A	A	D		D	C/D	A	
B	C		C	D				C		B	
		B/C					A/B/C/D		B		B/C/D
C	D		A	C		A/B/C		A/B		D	
					B/C/D						
A	A	A	D	B					A	C	A
EXPECTED DEGREE OF WORST IMPACT: MINOR	MINOR	MODERATE	MINOR	MINOR–MODERATE	MINOR	MODERATE	MINOR	MINOR	VERY MINOR	VERY MINOR	MINOR–MODERATE

SELECTED ALTERNATIVE COMPARISONS
(Data Based on Preliminary Location and is Subject to Review and Modification)

Alternative	Total Length (miles)	Estimated Displacements Farmsteads	Homes	Other	Estimated Costs in 1000s
Common Alignment	24.1	2	--	2*	$46,200
Alternative A	16.0	1	--	1**	$34,400 (1)
Alternative B	13.7	1	--	--	$31,100 (1) $35,000 (2) $41,900 (3) $38,200 (4)
Alternative C	14.4	2	--	1***	$37,800 (1) $44,300 (3) $41,700 (4)
Alternative D	15.0	2	--	1***	$38,000 (1) $44,500 (3) $41,900 (4)

(1) Low profile bridge.
(2) High profile bridge, using berm construction.
(3) High profile bridge, arched design.
(4) High profile bridge, girder construction.

* Includes a church and county maintenance garage in Dike.
** One barn, grain bin, shed.
*** River cabin, now used as a permanent dwelling.

RIGHT OF WAY

Alternative	Total Acres of Right of Way	Miles of Diagonal Severance	Estimated Acres of Prime Farmland
Common Alignment (Grundy Co.)	996	--	954.0
Alternative A	636	5.06	101.6
Alternative B	556	3.18	113.6
Alternative C	583	5.12	127.0
Alternative D	605	5.87	125.3

Estimates for Alternative A-D include figures for Hardin County Common Alignment.

GRUNDY/HARDIN COUNTIES
ROAD USER COSTS FOR U.S. 20 CORRIDOR

Route	Estimated Annual VMT	Estimated Annual Road User Cost	Annual Road User Cost Savings	Average $/VMT
Existing Condition	$220,300,000	$96,800,000	NA	$0.44
Alternative A	$218,400,000	$93,900,000	$2,900,000	$0.43
Alternative B	$214,600,000	$92,300,000	$4,500,000	$0.43
Alternative C	$215,800,000	$92,800,000	$4,000,000	$0.43
Alternative D	$216,800,000	$93,200,000	$3,600,000	$0.43

NOTES:

1 - Road user costs only include vehicle operating cost and time cost.

2 - Analysis includes traffic changes on all primary routes in the study area and most all of the paved county routes that would have traffic changes as a result of the alternative routes.

3 - Preliminary estimate based on the current traffic analysis. A more in-depth road user analysis would require a more detailed traffic analysis.

EXISTING ALIGNMENT
ALTERNATIVE COMPARISON

Alternative	Total Length	Total ROW Acres	Estimated Displacements	Diagonal Severance Mileage	Estimated Construction Costs in 1,000s
New Alignment (Averaged)	39.0	1,391	3	5	$ 76,000
Existing U.S. 20	59.5	1,552	59	4	$103,000*
Existing Iowa 175	69.5	1,904	32	10	$105,000*

*Estimates updated to reflect current costs.

ESTIMATED ACRES OF FOREST TO BE REMOVED BY U.S. 20 WITHIN GREENBELT
(Based on 300-foot Right of Way)

	Alternative Alignments			
Forest Quality	A	B	C	D
B+	4			
B				
B-				
C+			1	
C	7	17	13*	1*
C-	3	3		
D+		(less than 0.5)		
D	1			
D-				
Total Acres	15	20	14	1
Acres Within Master Plan's Proposed Priority Management Areas	15	6	14	1

*Considers complete span of river valley.

RELOCATED U.S. 20
ESTIMATED RIGHT OF WAY NEEDS
BY LAND USE TYPE

Right of Way Needs in Acres

	Crop/Pastureland	Woodlands	Areas Classified As Prime Farmland
Alternative A	617	19	101.6
Alternative B	531	25	113.6
Alternative C	564	19	127.0
Alternative D	599	6	125.3
Grundy County Common Alignment	992	4	954.0

POTENTIAL PROJECT RELOCATIONS

	Farmsteads	Other	Owners	Tenants
Alternative A	2	2*	1	1
Alternative B	1	1**	0	1
Alternative C	1	--	1	0
Alternative D	2	1***	2	0
Grundy County Common Alignment	2	1***	2	0

* Includes a church and county maintenance garage located community of Dike near the eastern end of the project.

** One barn, grain bin, and a shed.

***River cabin not used as a permanent dwelling.

NUMBER OF HIGHWAY MILES WITH
HIGH POTENTIAL FOR DEER-VEHICLE ACCIDENTS

Alternative	Total Miles	Number of Miles With High Accident Potential
A	12	4
B	10	6
C	11	5
D	12	2

SUMMARY OF NATURAL QUALITY
ACREAGES FOR EACH STUDY ALTERNATIVE
(One-Half Mile Wide Study Corridor)

Alternative		B+,B,B-C+	C,C-	D+,D,D-	Total
A	Forest	23	98	92	213
	Prairie	4	26	12	42
	Total	27	124	104	255
B	Forest	54	218	54	326
	Prairie	--	7	--	7
	Total	54	225	54	333
C**	Forest	1	154	36	271
	Prairie	4	5	--	9
	Total	85	159	36	280
D**	Forest	15	64	1	80
	Prairie	5	5	--	10
	Total	20	69	1	90

* Acreage includes all forested or prairie areas within one-half mile corridor for each alternative.

**Includes 76 acres of overlap between Alternatives C and D.

Homes Most Affected By U.S. 20 Traffic Noise
In Alternative Greenbelt Crossing Areas

Alternate	Homes Within 400 feet
A	4
B	8
C	7
D	4

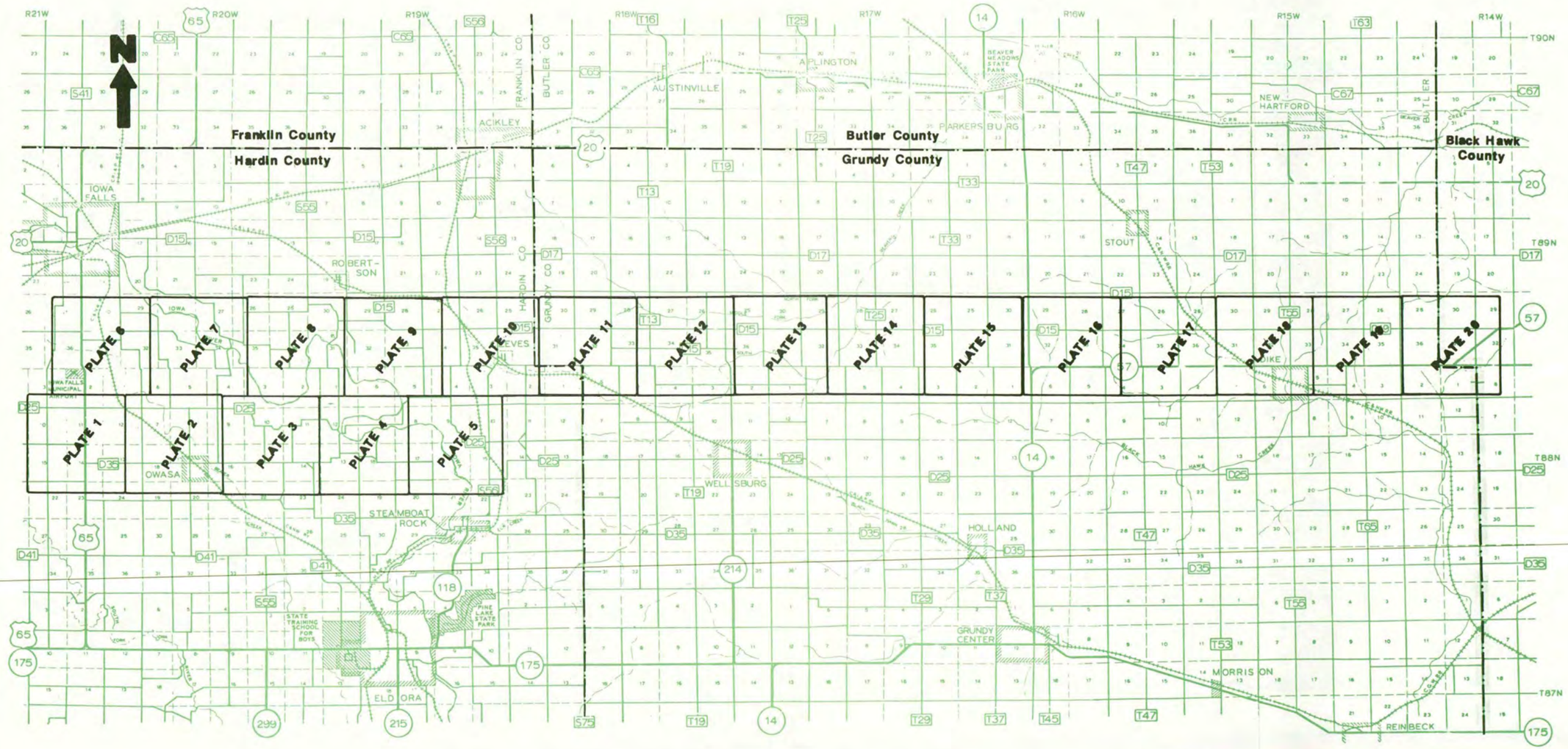
Occurrence of State Endangered and Threatened Species of Mussels in the Project Corridors

	Mussel Species					
	Fluted Shell		Strange Floater		Elktoe	
	Live	Dead	Live	Dead	Live	Dead
Alternative A						
Number From Transects	4	56	2	11	7	39
*Qualitative Sample	X	X	X	X	X	X
Alternative B						
Number From Transects	1	10	4	1	11	3
*Qualitative Sample	X	X	X	X	X	X
Alternative C/D						
Number From Transects				1		
*Qualitative Sample	X	X	X	X	X	X

*Indicates species presence but not necessarily along transect lines.

Appendix 2

Aerial Photographic Plates



LOCATION OF AERIAL PHOTOGRAPHIC PLATES

LEGEND

AERIAL PHOTOGRAPHIC PLATES

1988 PHOTOS

PROPOSED RELOCATED US 20 CONSTRUCTION ALTERNATIVES

BRIDGE CONSTRUCTION

CORPORATION LINES

SECTION LINES

COUNTY LINES

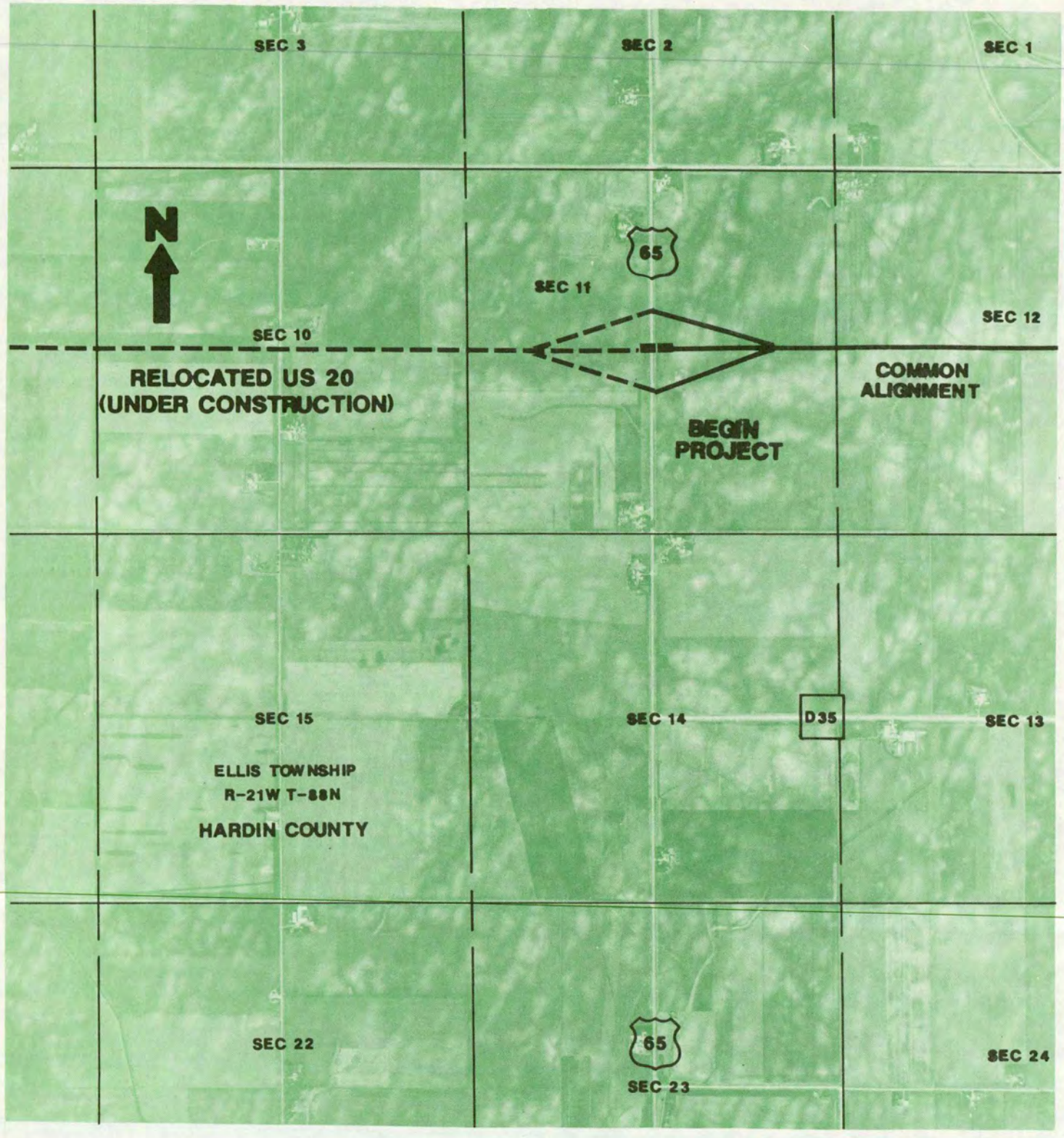
GRADE SEPARATIONS

PROPOSED ACCESS ROADS

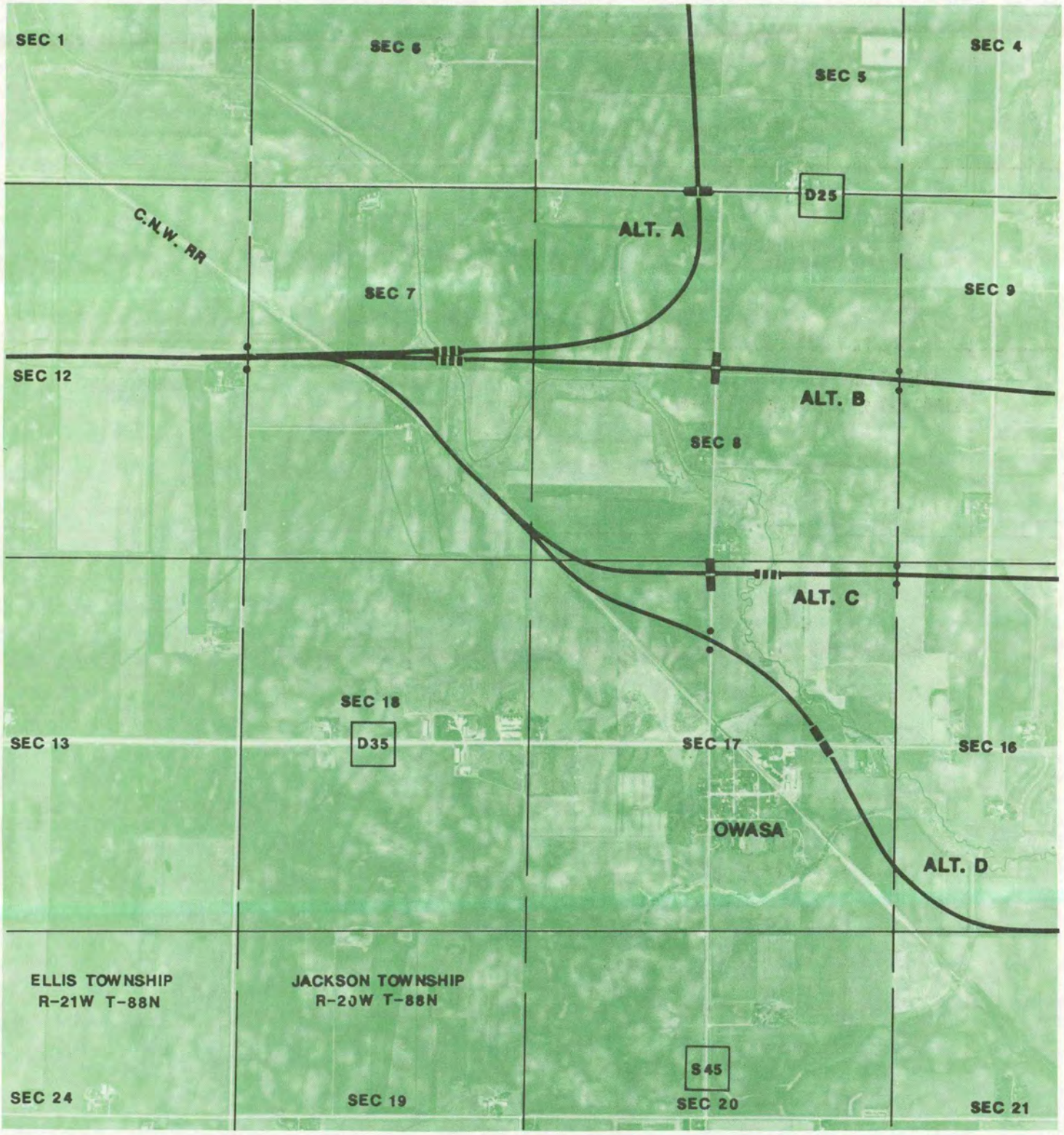
PROPOSED ROAD CLOSURES

NOTE: THE ABOVE SYMBOLS REPRESENT

APPOXIMATE LOCATIONS AND ARE NOT TO SCALE



SCALE: 1" = 2000'	PLATE 1



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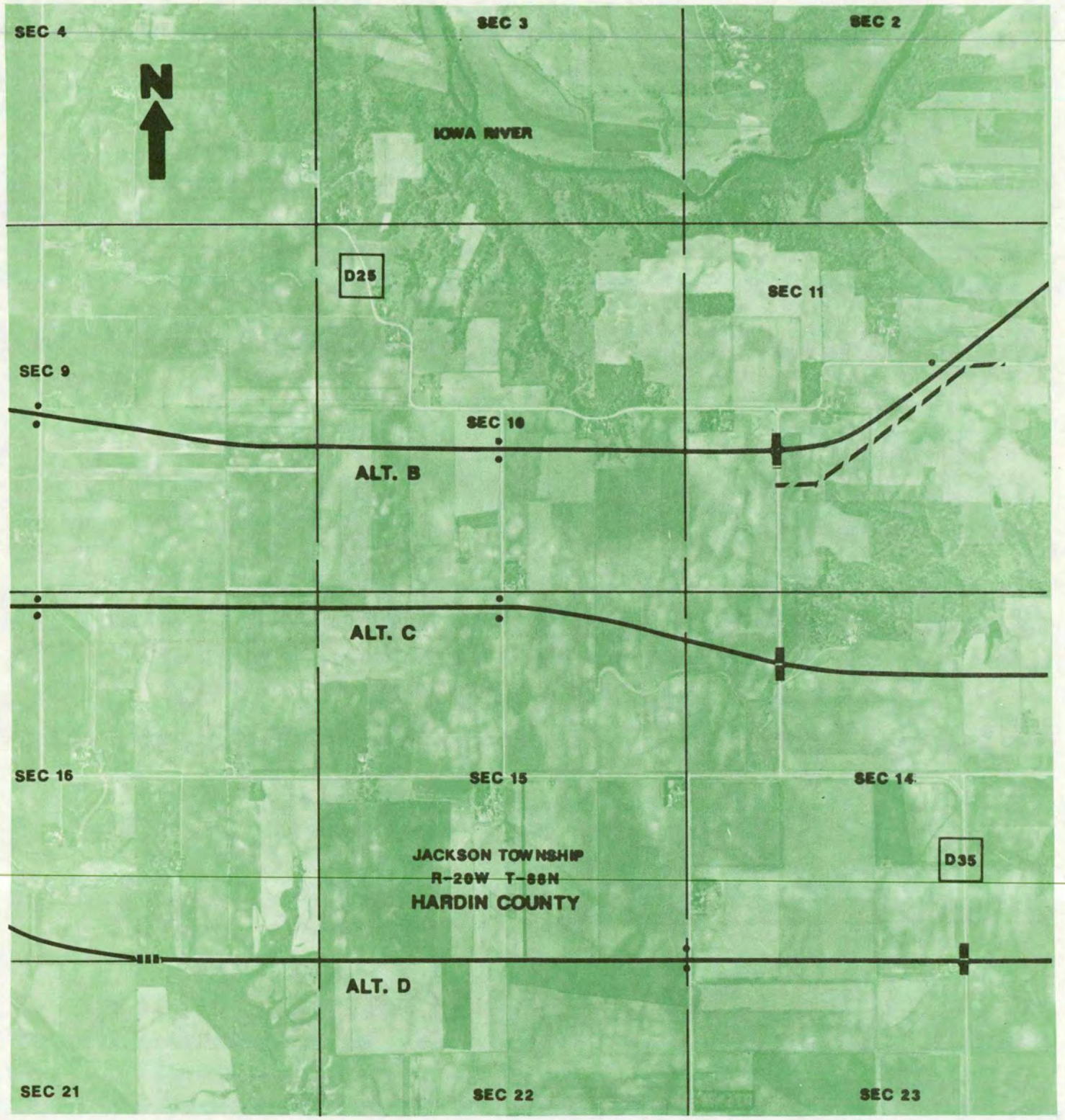

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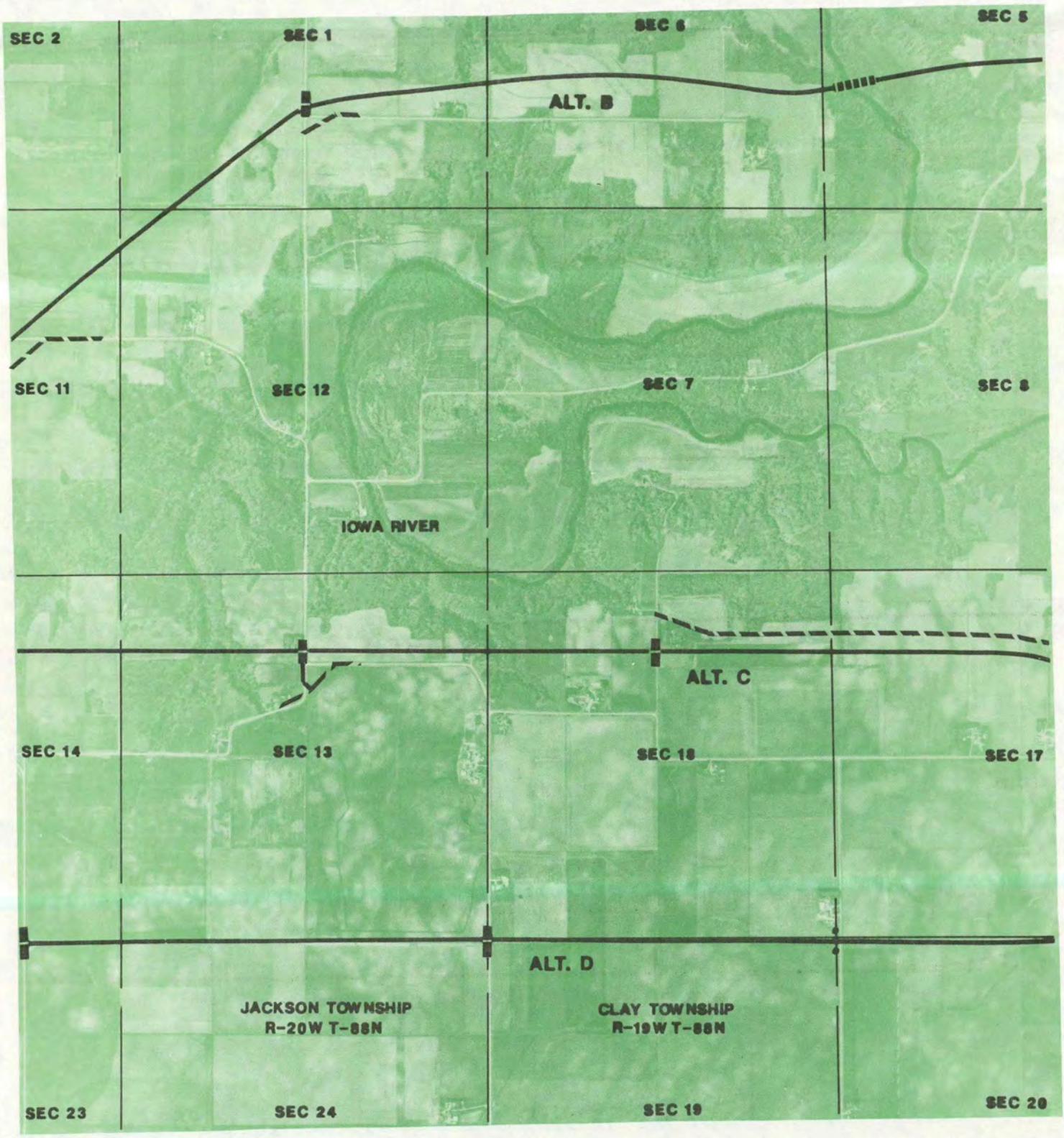

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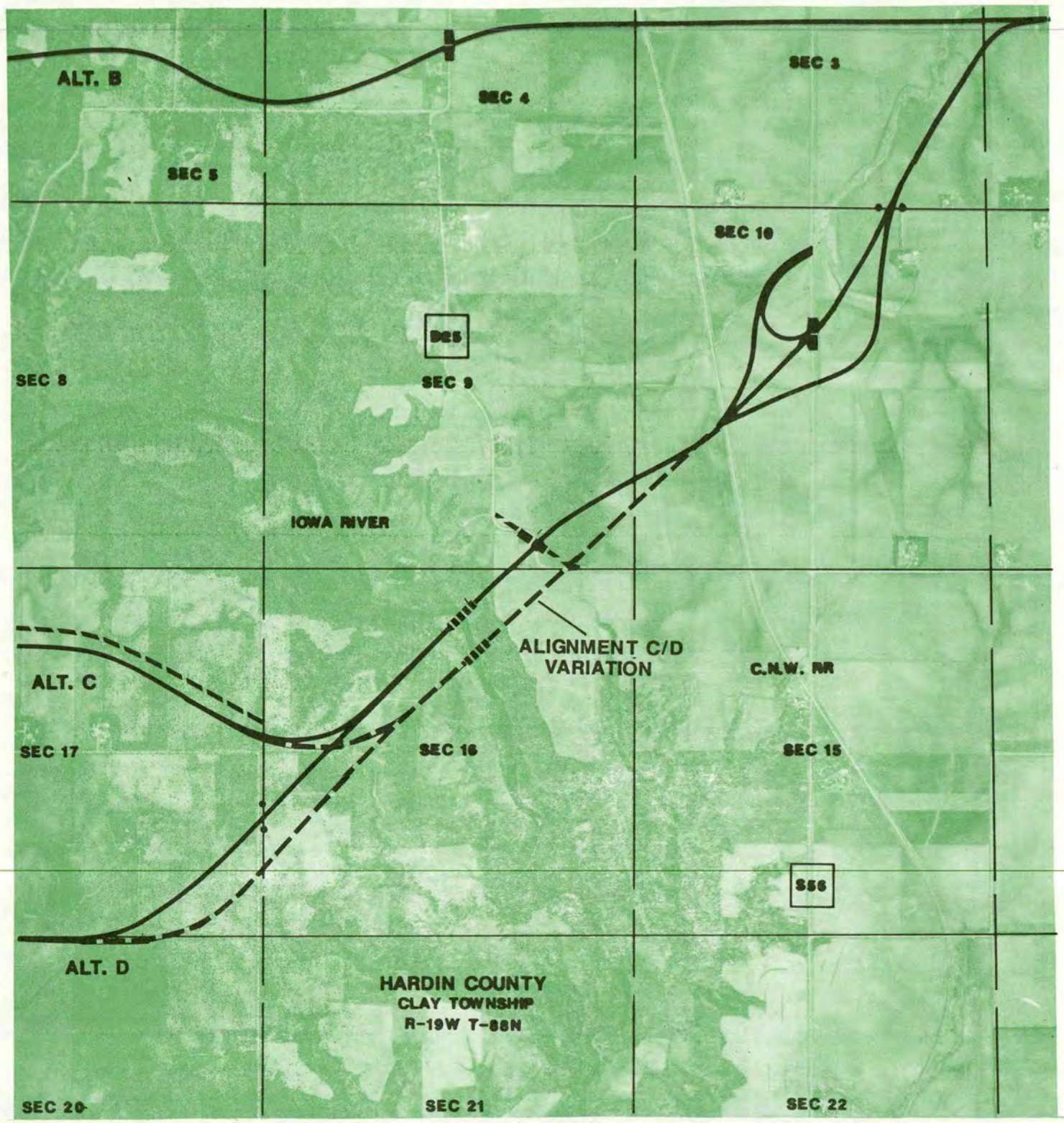

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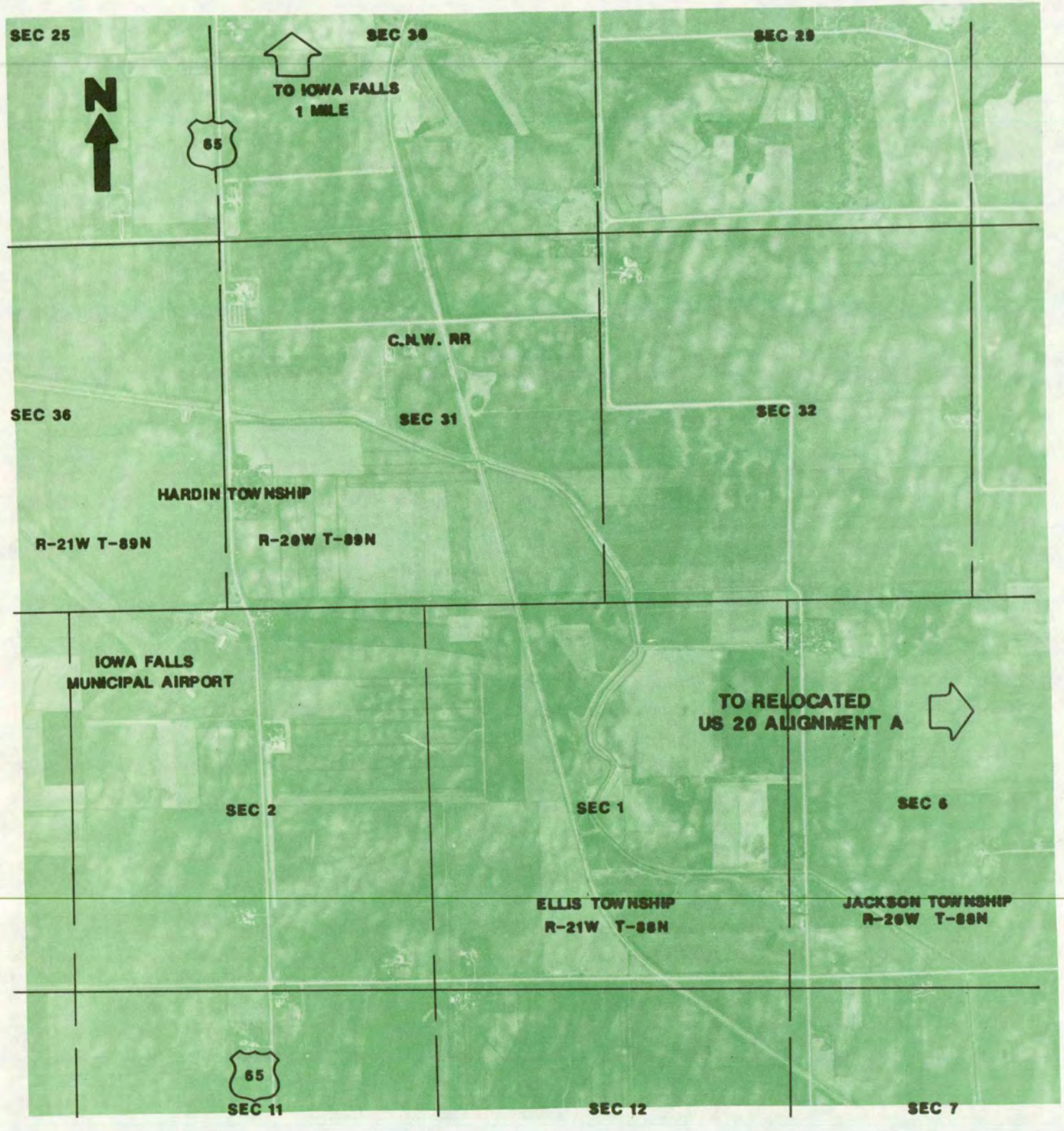

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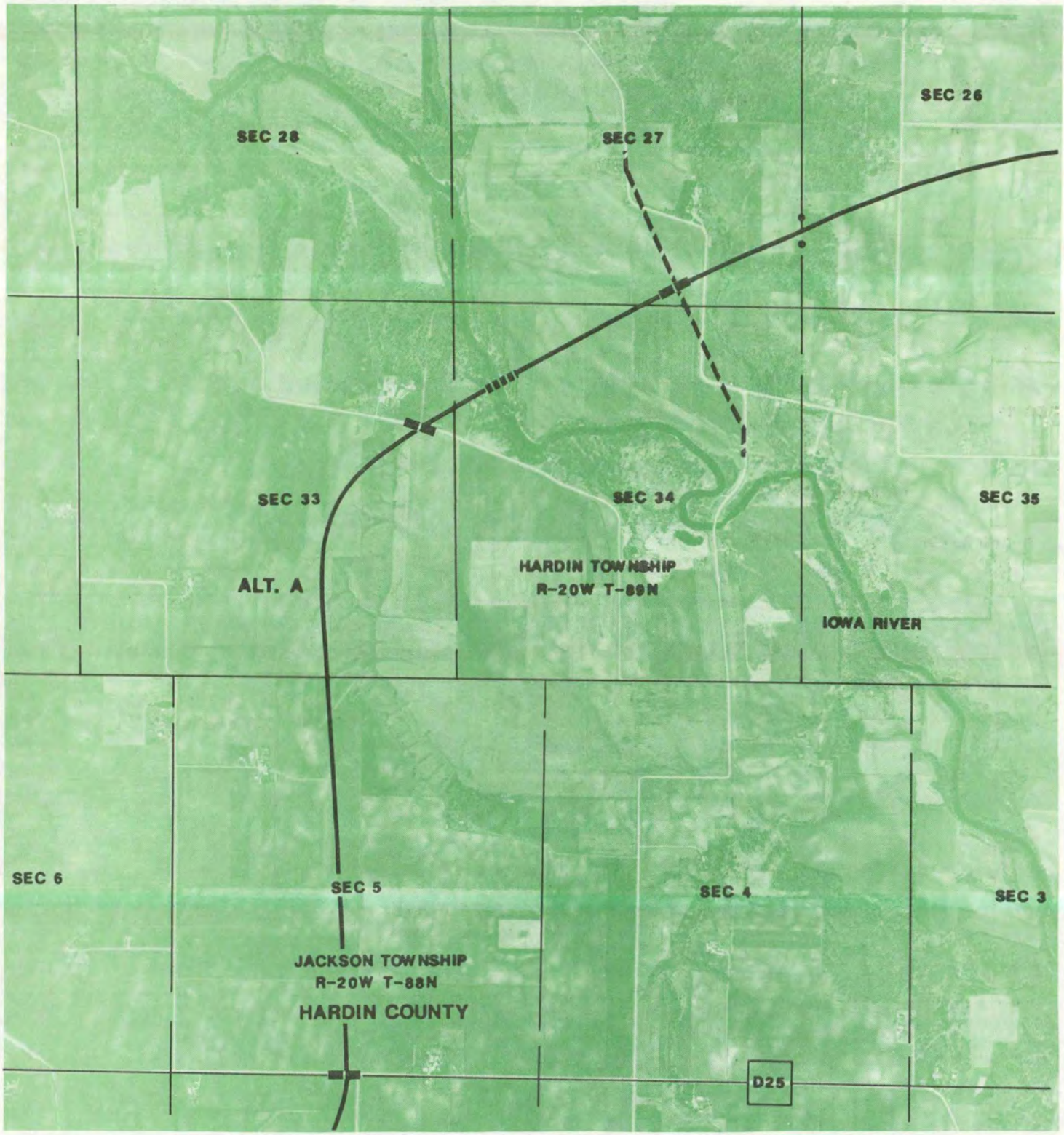

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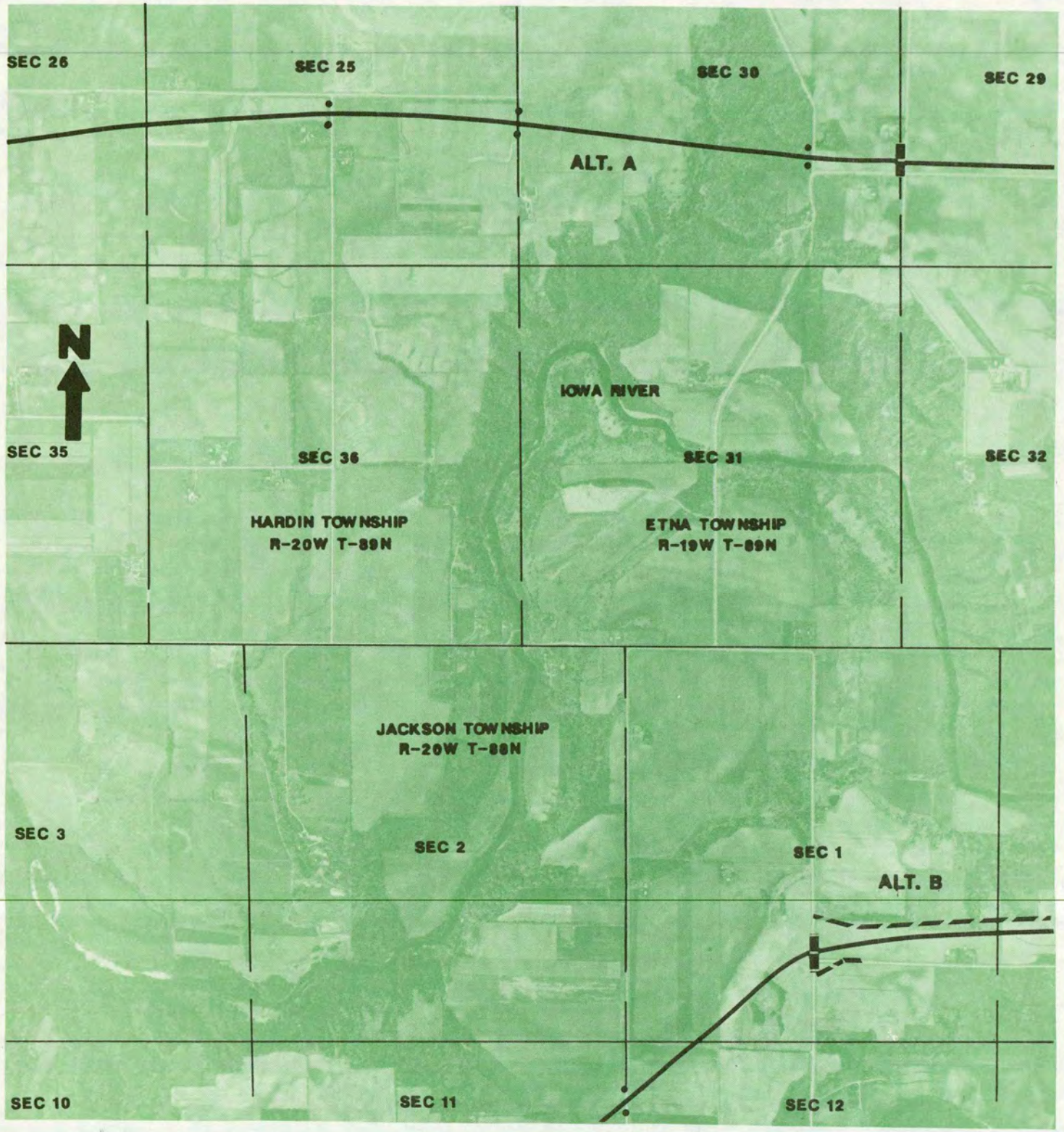

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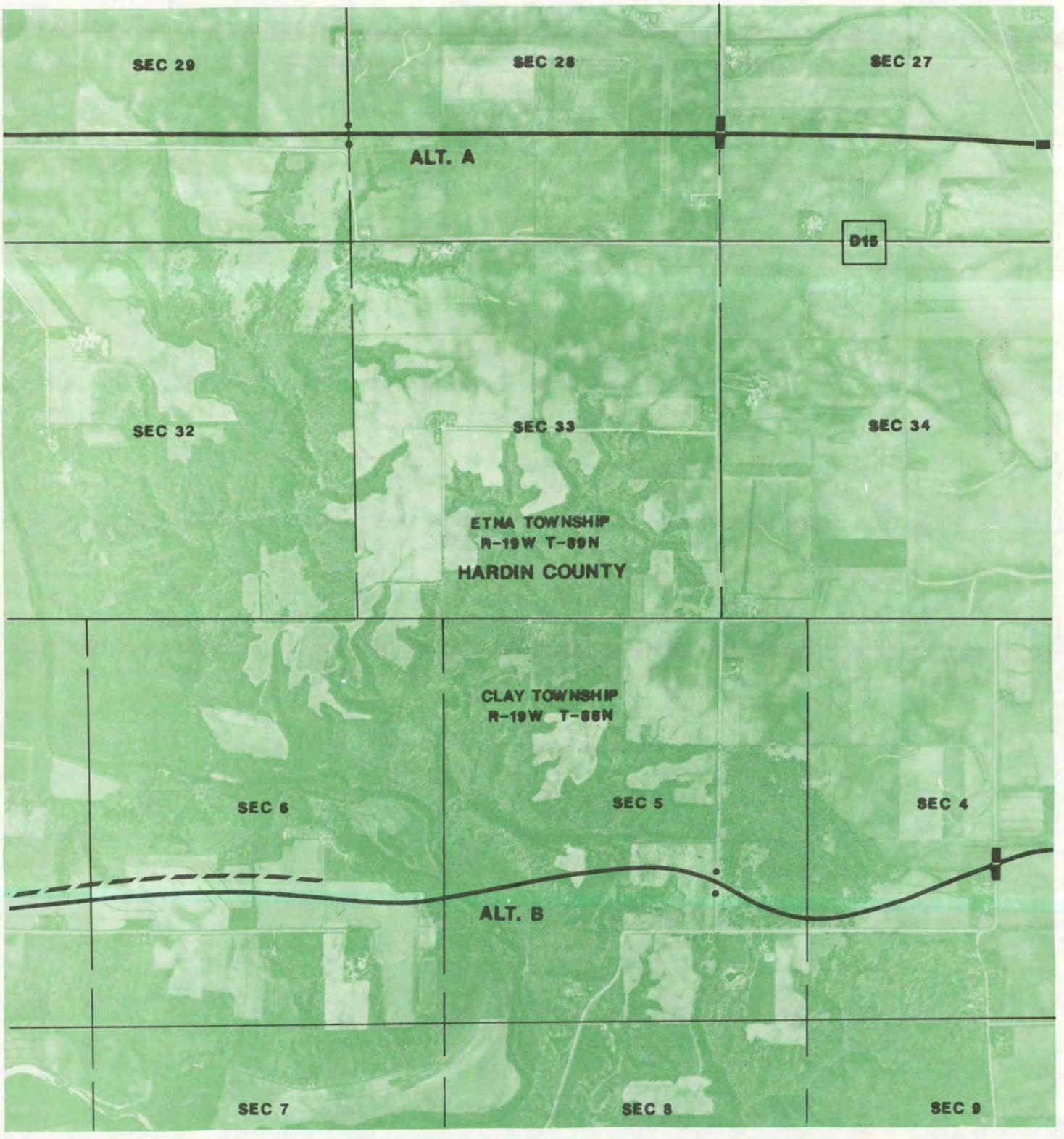

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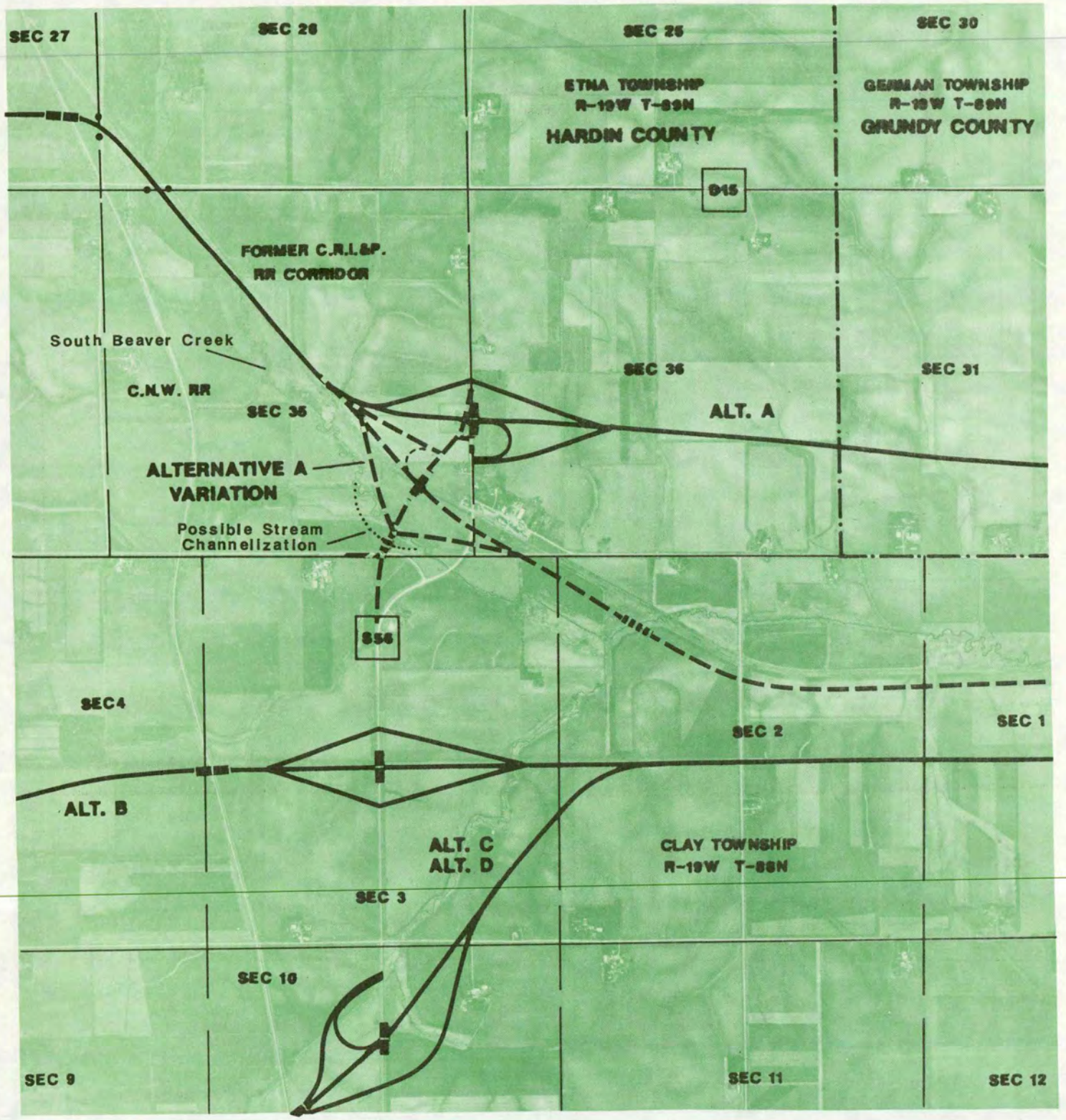

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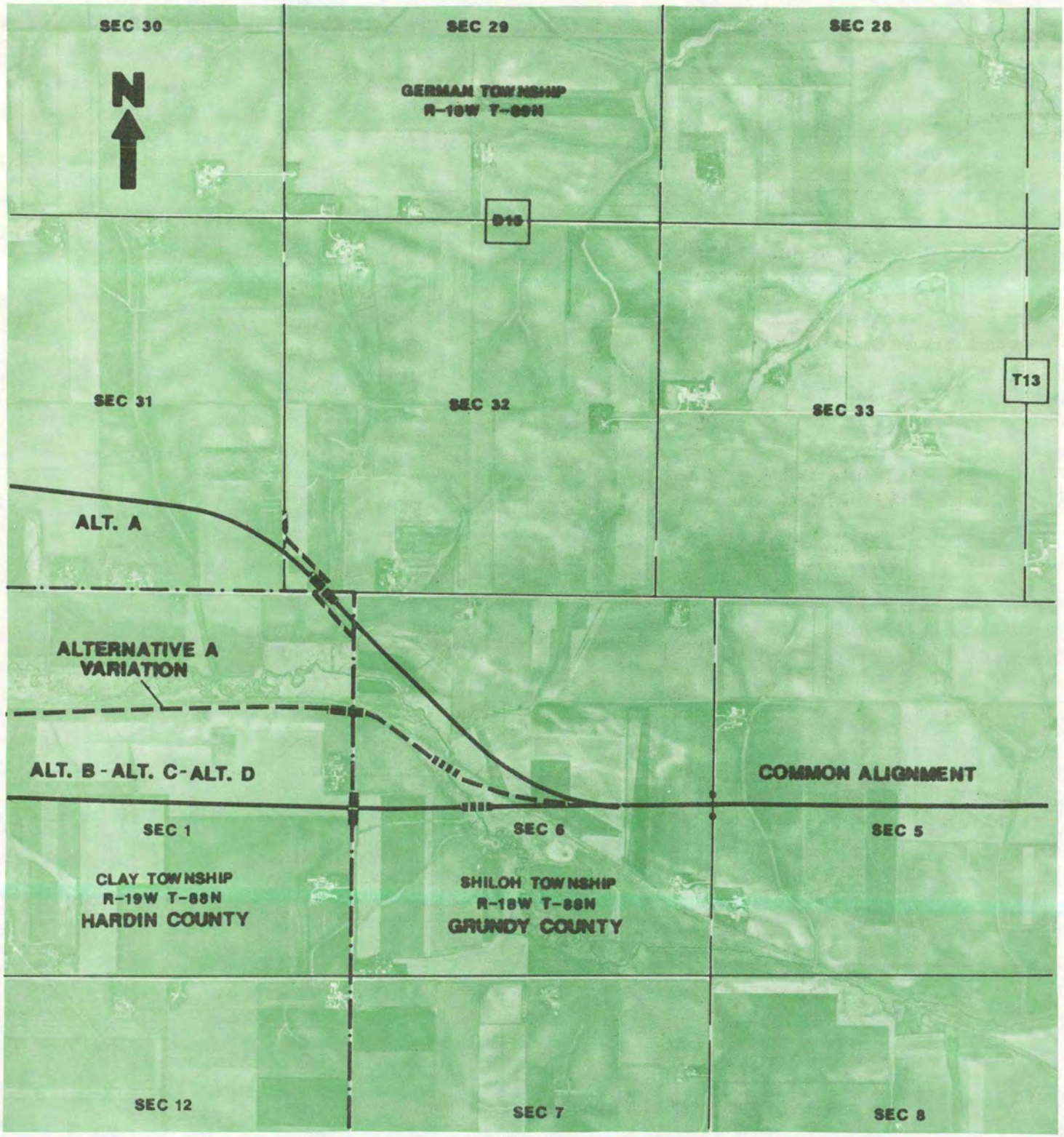

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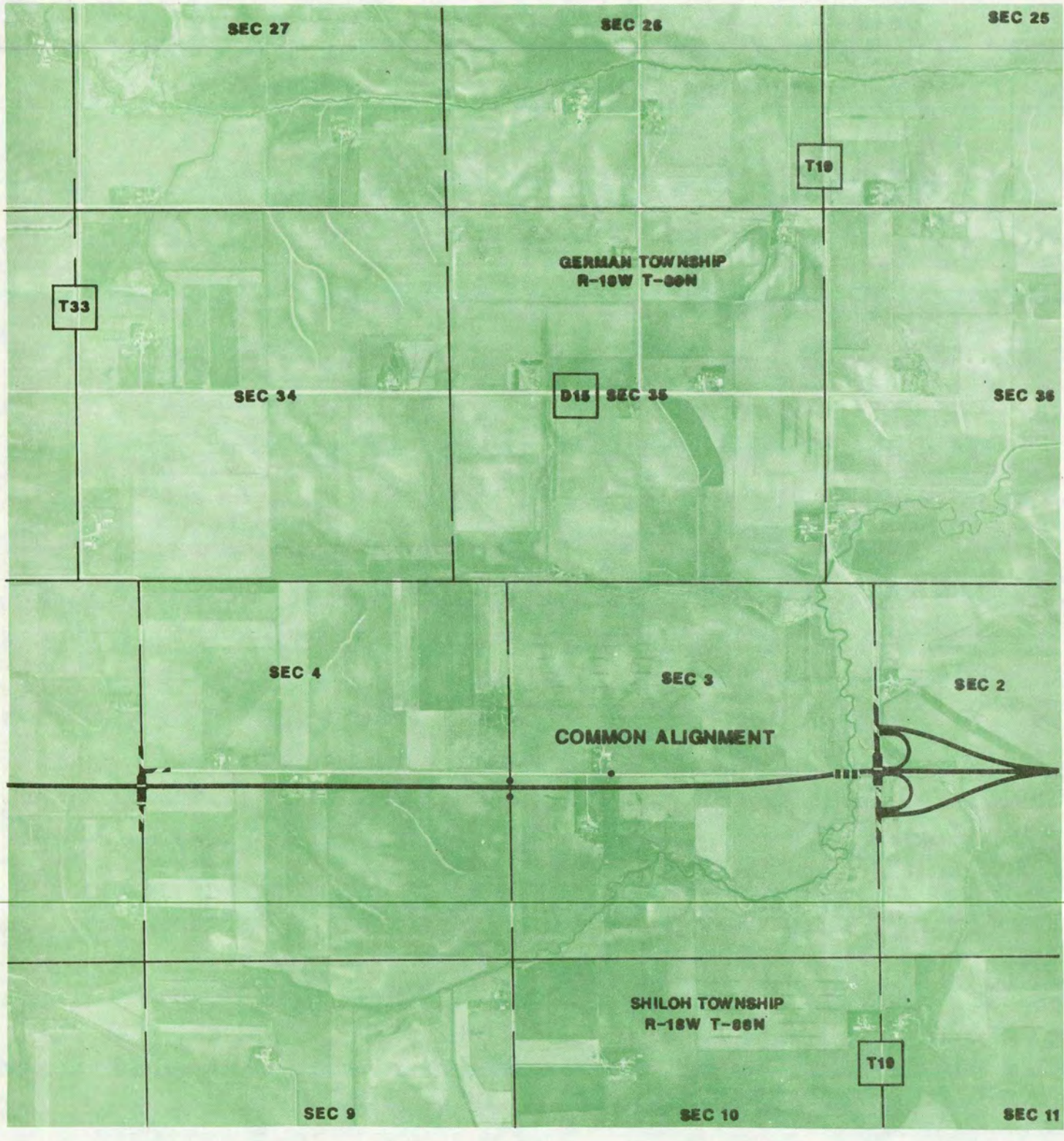

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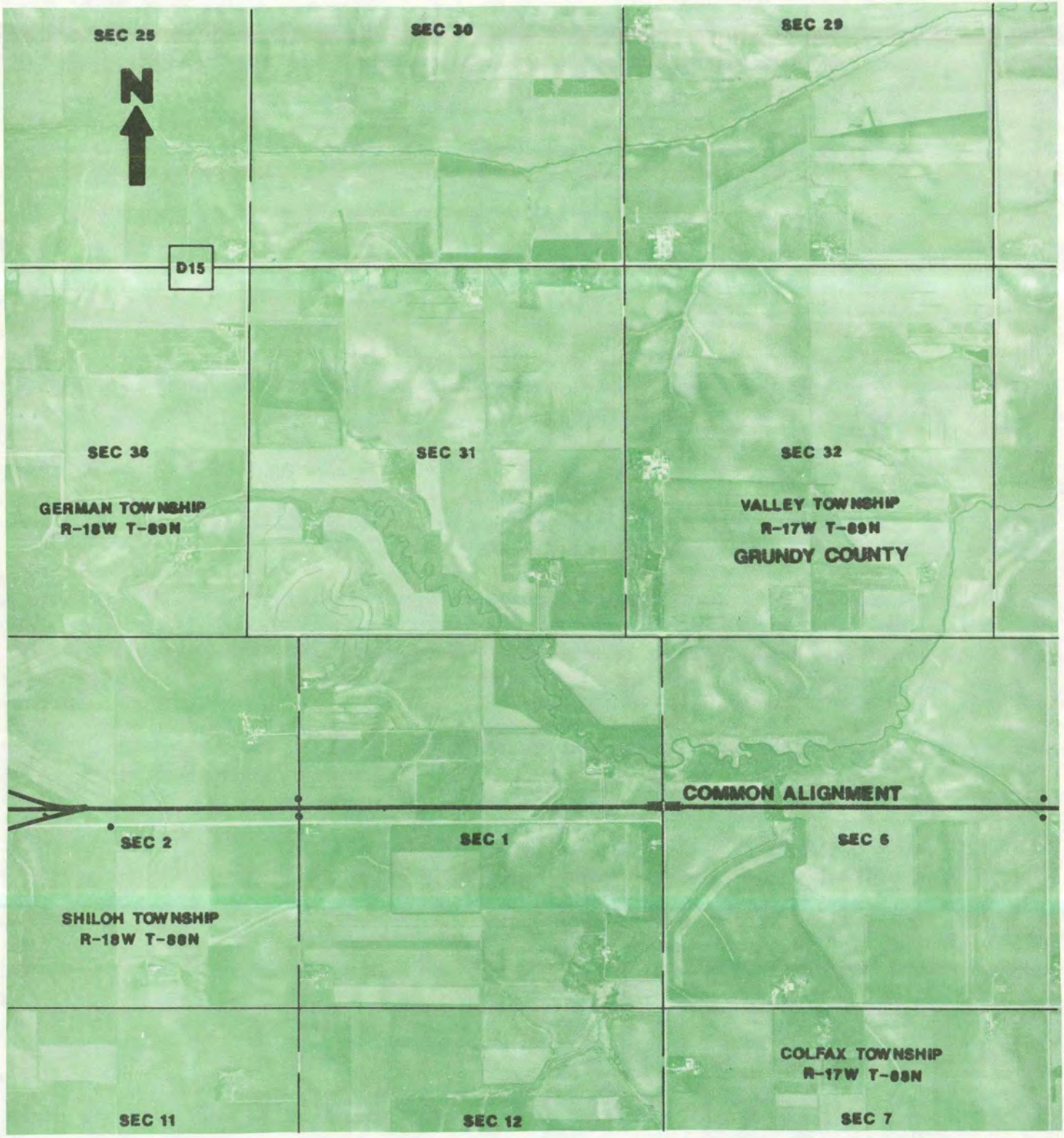

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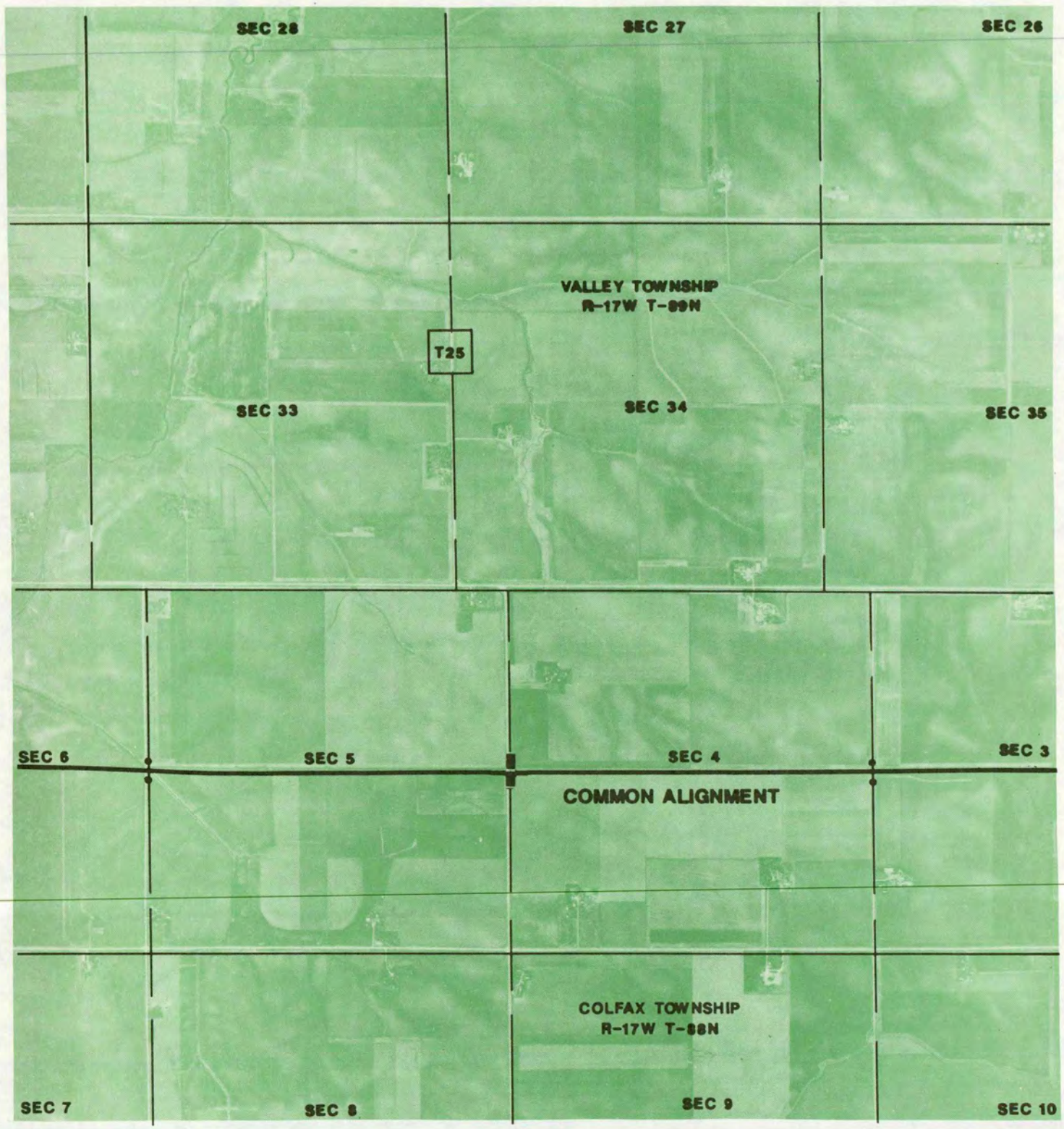

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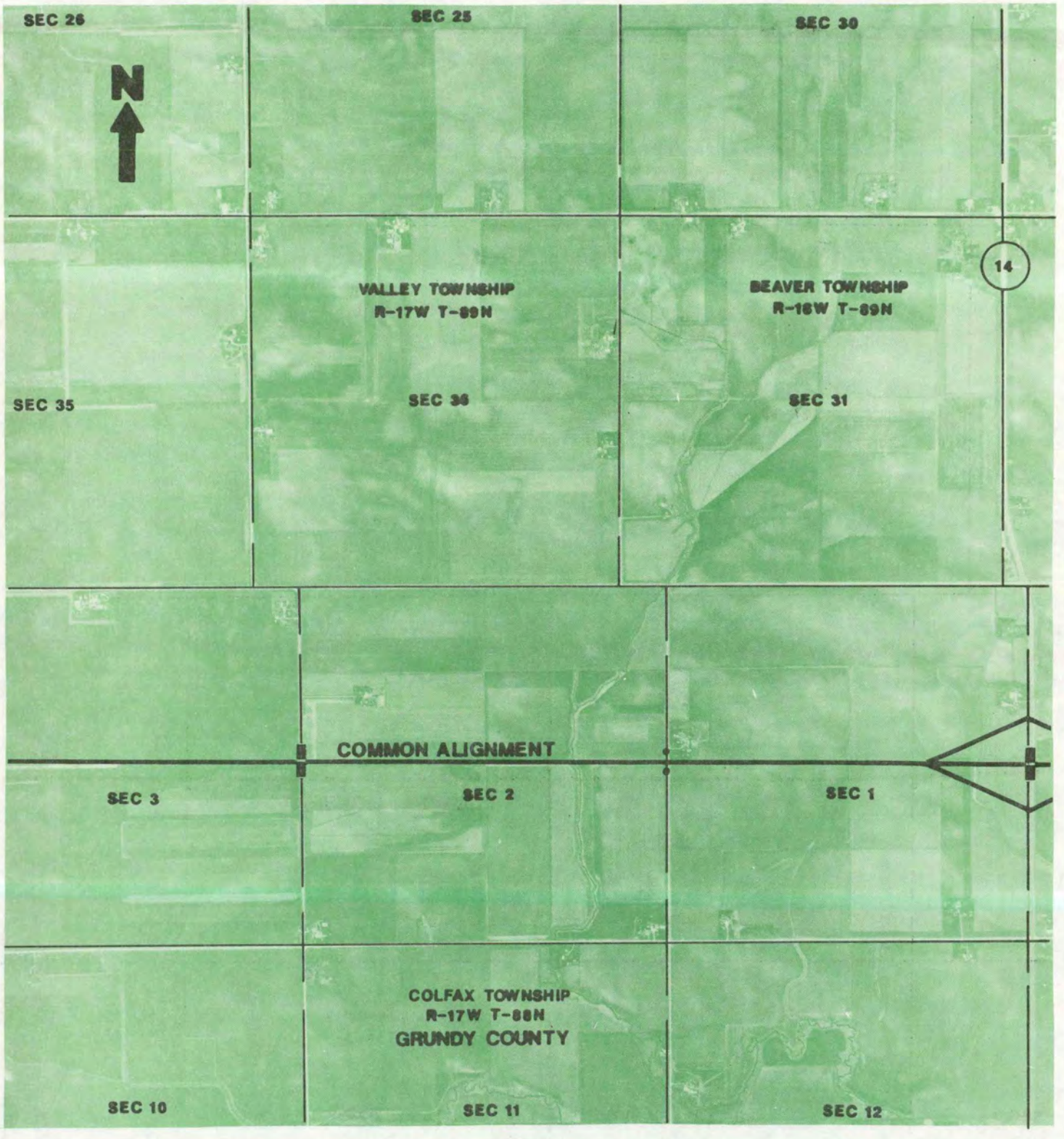

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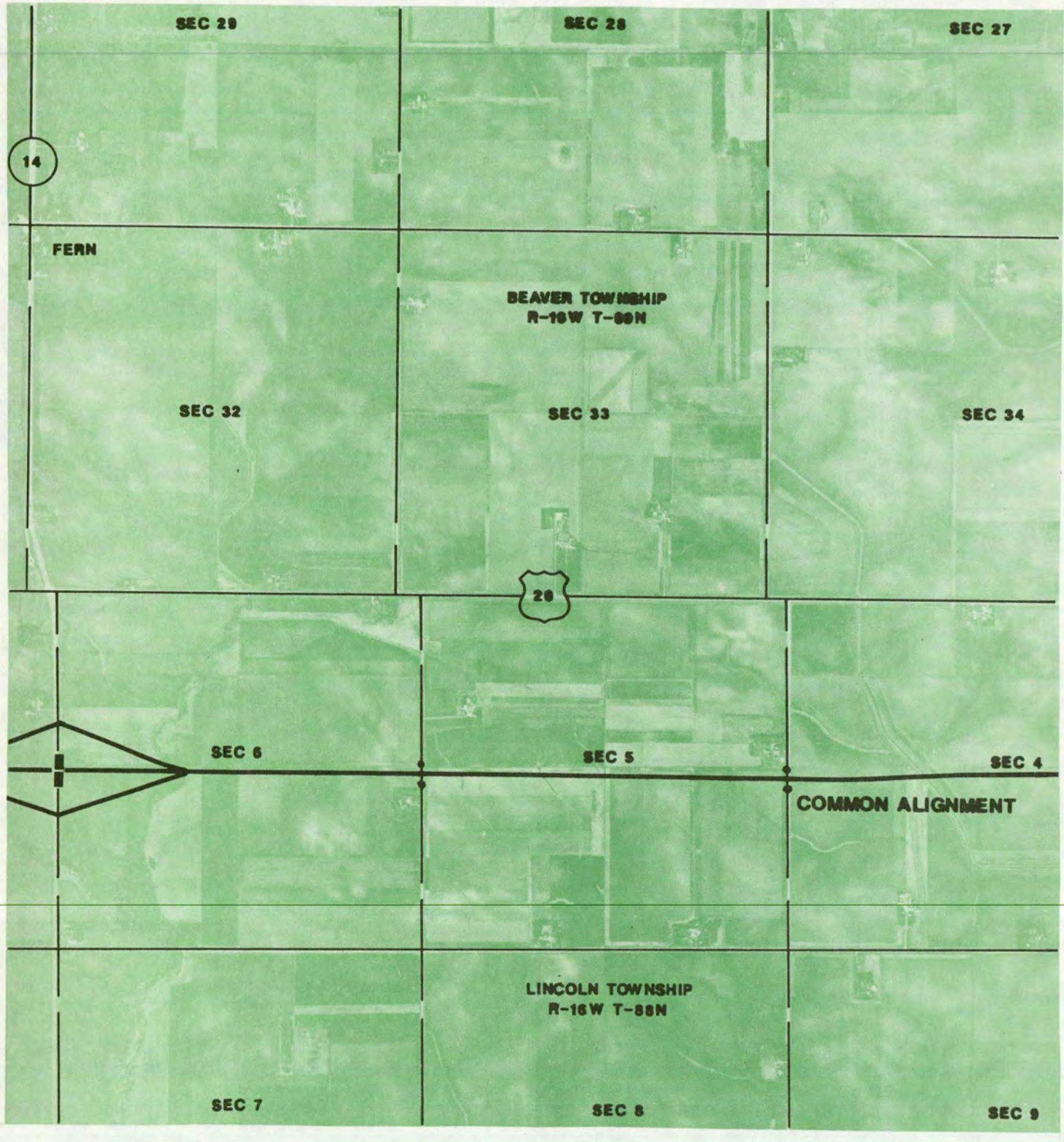

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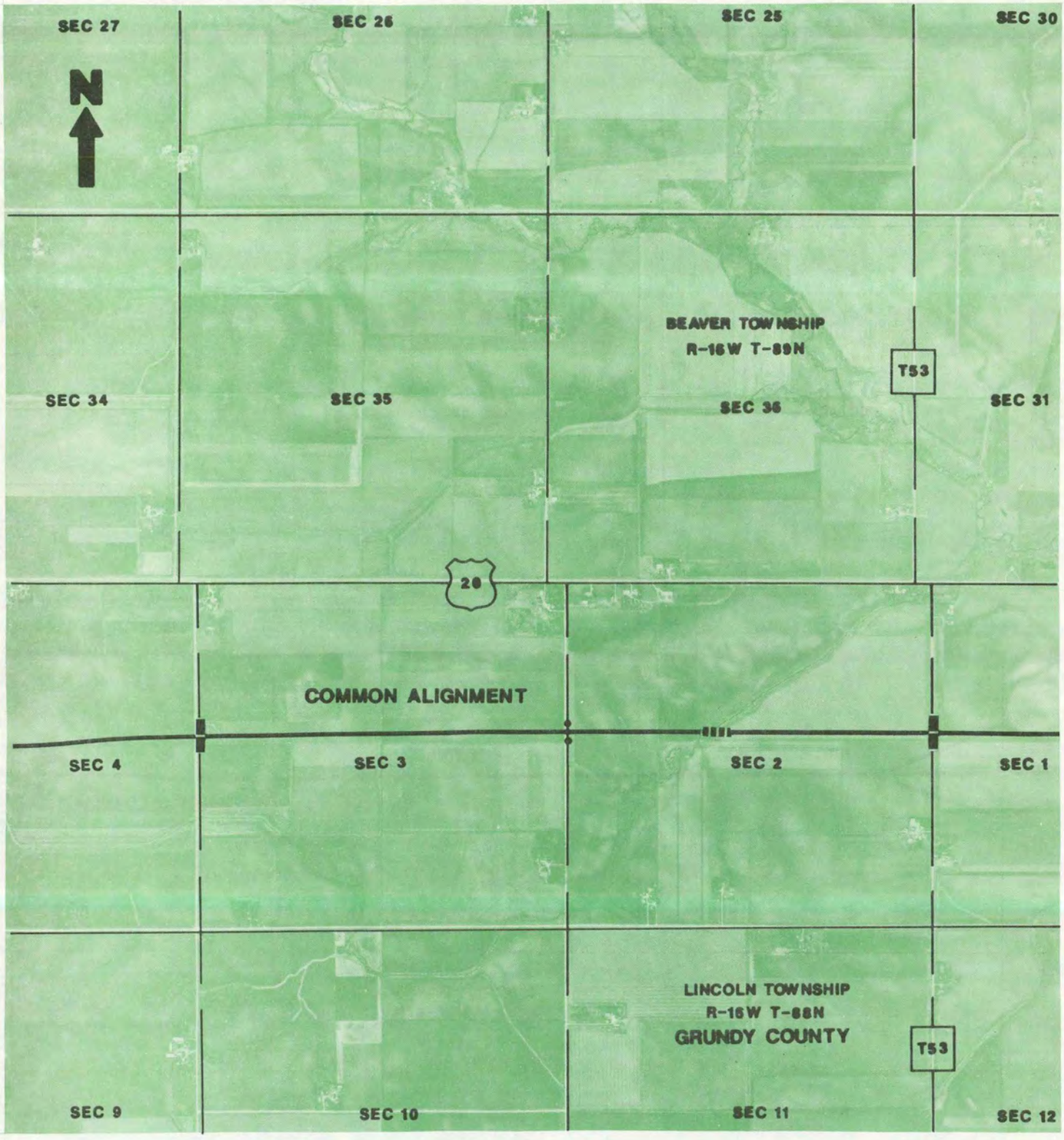
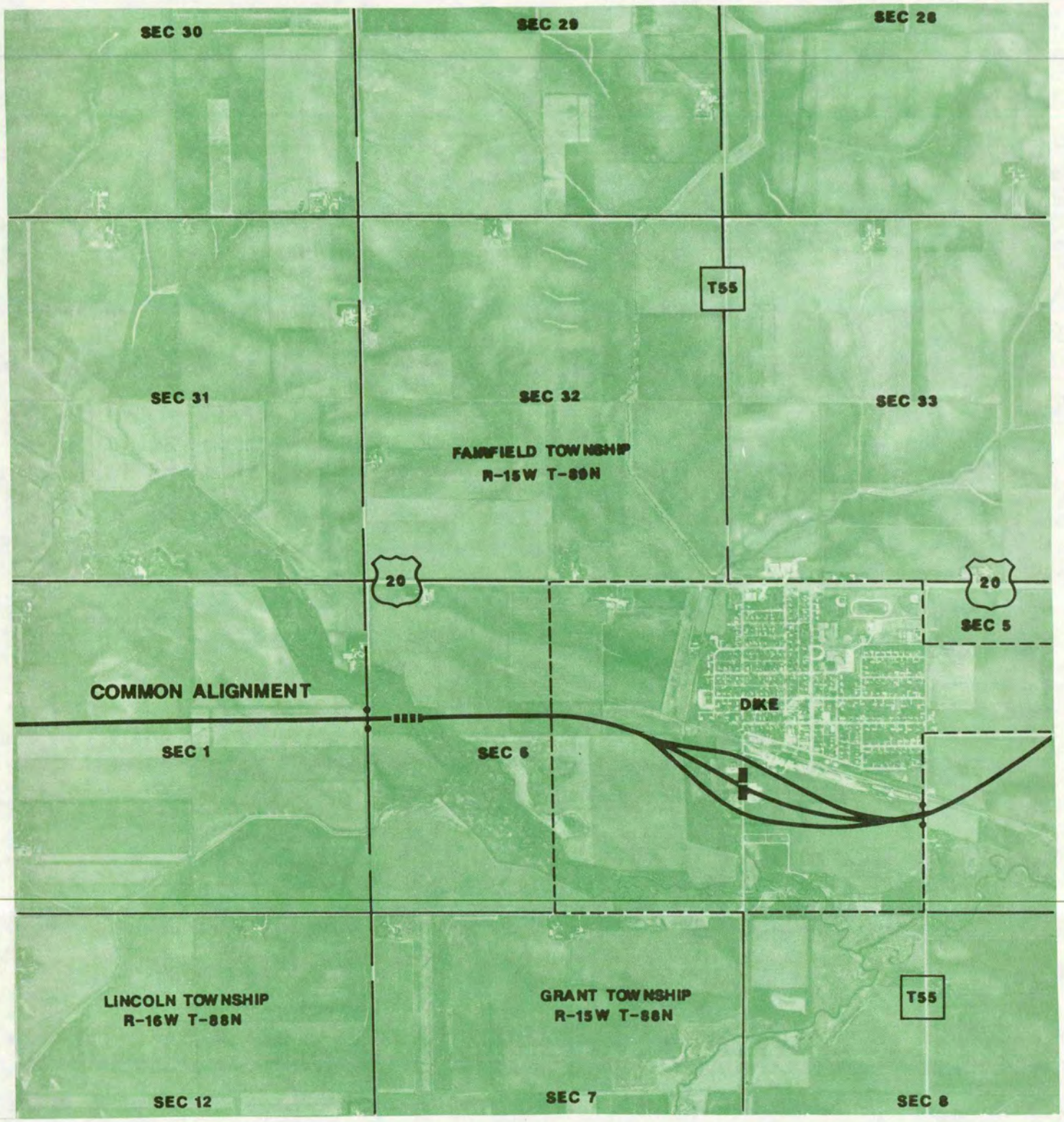
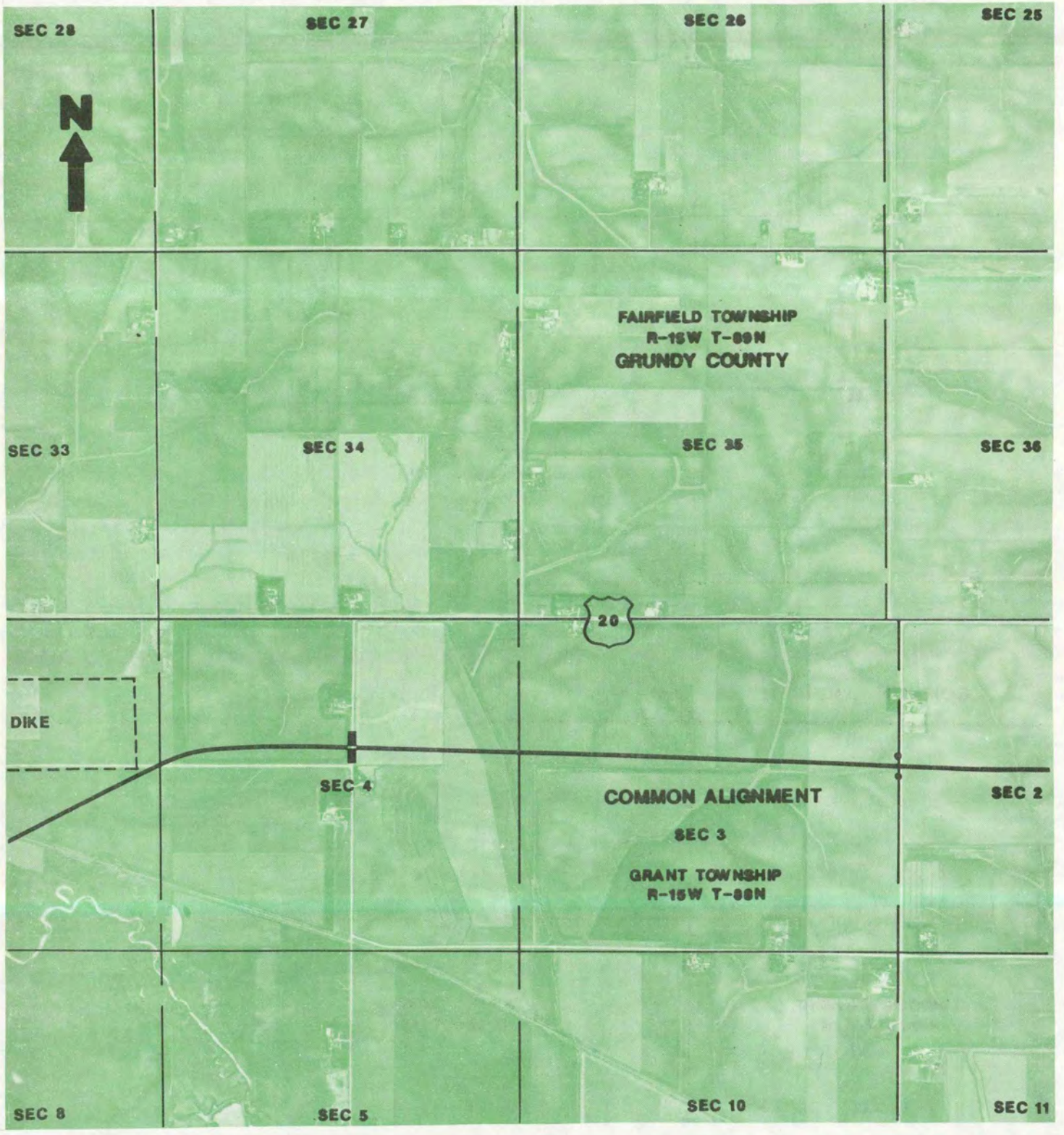


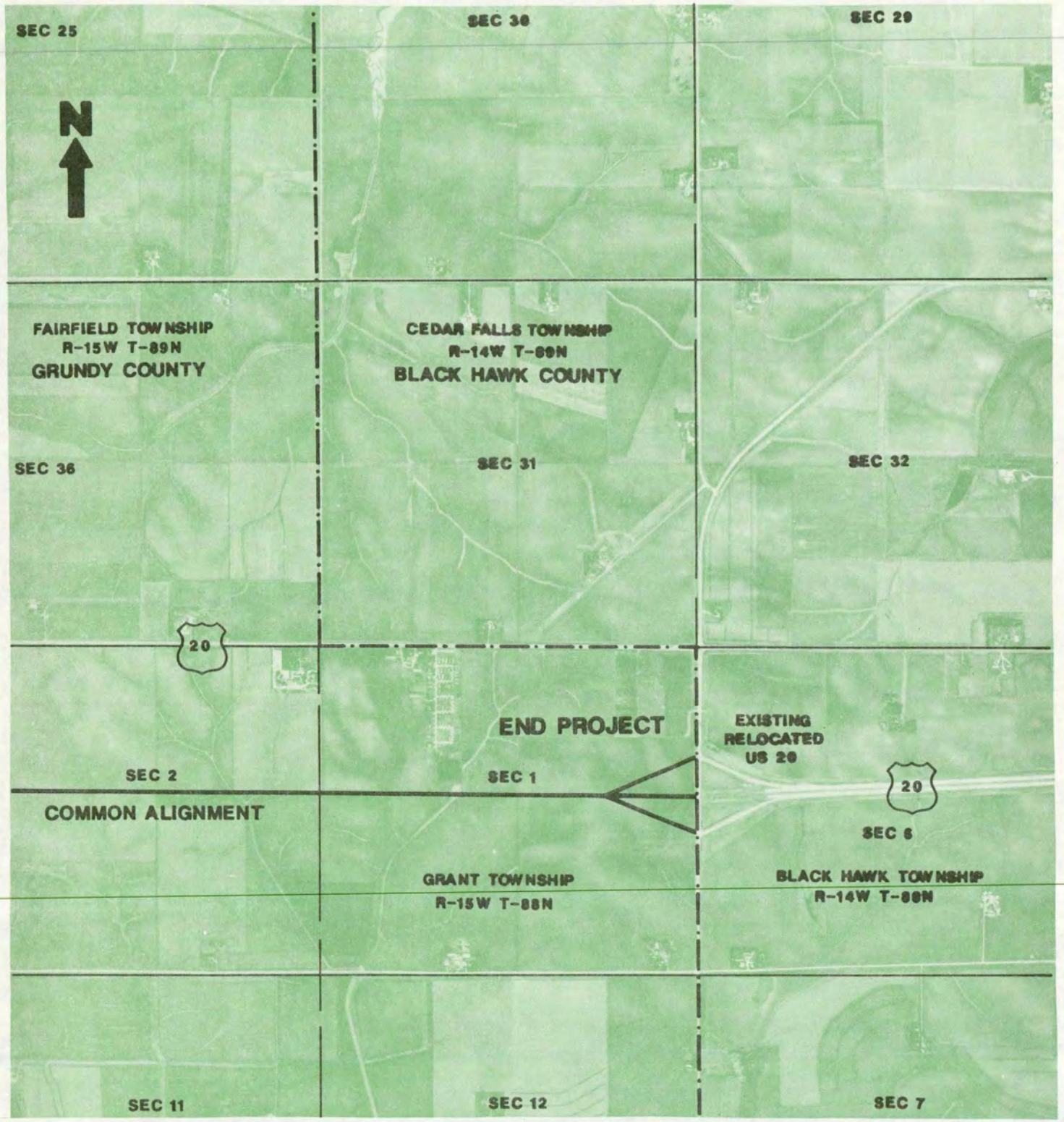
SCALE: 1" = 2000' | **PLATE 17**



SCALE: 1" = 2000'	PLATE 18



SCALE: 1" = 2000' | **PLATE 19**



SCALE: 1" = 2000'	PLATE 20

Appendix 3

Draft Section 4(f) Evaluation

SAND SPRINGS

The Sand Springs Unit is administered by the Hardin County Conservation Board and consists of five individual parcels of land totaling about 216 acres in Sections 15 and 16 of Clay Township. A map of the park detailing individual parcel ownership is shown in Figure 1A. Figures 15 and 16 show this facility and its relationship to other area parks. The primary function of this park is as a nature preserve, however, hunting, fishing, hiking, and primitive camping are encouraged. A cross country ski trail is planned for future development, but at present there are no developed facilities in the park. The annual number of users/visitors is estimated at 1,000. Principle access to Sand Springs is provided from the east from an adjacent local road. A north access is also available, although this is generally used as a maintenance access. No vehicles are permitted in the park.

Sand Springs was acquired through land purchases by the Iowa Department of Natural Resources and the Hardin County Conservation Board. Some parcels were acquired by the Iowa Natural Heritage Foundation, an Iowa non-profit environmental preservation organization. It is expected that these parcels will eventually be turned over to the county or state. No land or water conservation funding has been used in either acquisition or development of this park. Additionally, there are no limiting clauses in effect that would limit use or development of the facility.

Noteable elements of this park include a grouping of Indian burial mounds located near the southern boundary and the location of an archaeological site near the northern boundary. These sites are designated 13HA30 and 13HA65, respectively, and evaluated in the project archaeological survey included by reference in this report. Neither site is listed as being potentially National Register eligible. See Figure 1A for the appropriate location of these sites.

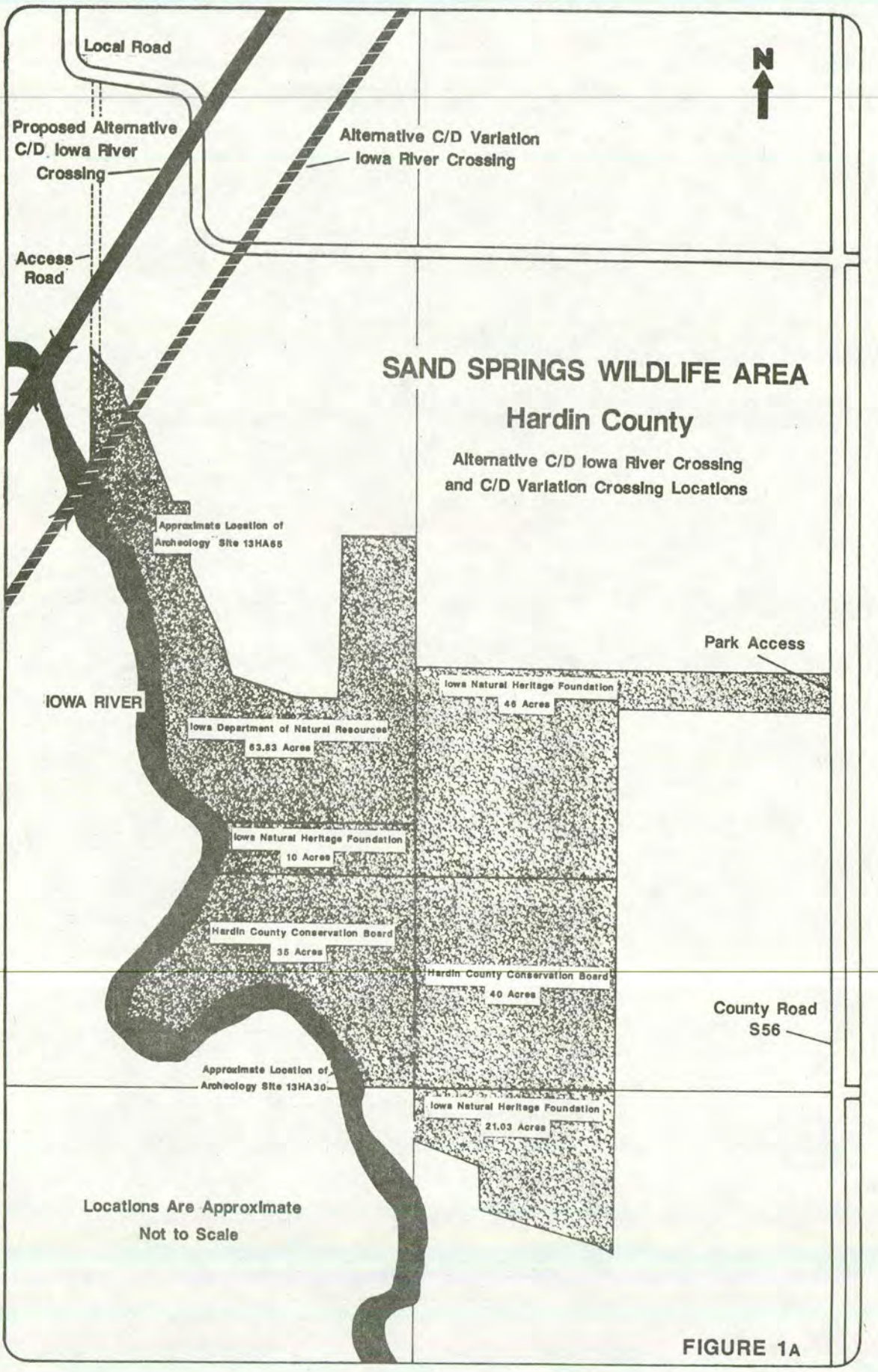

Local Road
N
Proposed Alternative C/D Iowa River Crossing
Alternative C/D Variation Iowa River Crossing
Access Road
SAND SPRINGS WILDLIFE AREA
Hardin County
Alternative C/D Iowa River Crossing and C/D Variation Crossing Locations
Approximate Location of Archeology Site 13HA65
Park Access
IOWA RIVER
Iowa Natural Heritage Foundation
46 Acres
Iowa Department of Natural Resources
63.83 Acres
Iowa Natural Heritage Foundation
10 Acres
Hardin County Conservation Board
35 Acres
Hardin County Conservation Board
40 Acres
County Road S56
Approximate Location of Archeology Site 13HA30
Iowa Natural Heritage Foundation
21.03 Acres
Locations Are Approximate
Not to Scale

FIGURE 1A

Project Impacts

Figure 1A depicts the location of Sand Springs and details both potential Iowa River crossings for the Alternative C and D common alignments. In viewing this figure, it can be seen that the proposed C/D alignment passes near Sand Springs but would not infringe on park property. The C/D alignment variation, which is located about 500 feet downstream from the proposed crossing site, would however, proceed diagonally across park property along the northern most extremity of the facility, and would require about 2 1/2 acres of park property. Both alignments would eliminate park access from the north, which currently serves as access for park maintenance activities.

Avoidance Alternatives

None of the greenbelt alternatives (A through D) as proposed, would impact park property and accordingly each would serve as avoidance alternatives to converting land from Sand Springs to transportation uses. However, one measure that was developed to reduce impacts of the proposed C/D alignment near the Iowa River crossing, and enhance its value as a construction option through the greenbelt, would be to relocate the crossing site approximately 500 feet downstream, to the optional crossing location designated as the Alternative C/D variation alignment (Figure 1A).

It should be kept in mind that throughout the planning and preliminary design for the relocated U.S. 20 improvement a number of alignment modifications were incorporated into project design to minimize potential impacts. These included alignment shifts away from the more sensitive or high quality natural areas, changes to avoid farming operations, wetlands and so forth. Relocating the C/D crossing downstream by 500 feet is yet another opportunity to reduce potential impacts by avoiding a higher quality natural area and reducing right of way impacts, although doing so would result in project infringement on the Sand Springs Wildlife Area.

The rationale behind this proposal is best illustrated in the following comparison:

Proposed C/D Alignment	C/D Alignment Variation
• The proposed C/D crossing is less favorable from an engineering perspective, because of topography and the probable requirement to incorporate river bank stabilization to protect piers for the new bridge from river bank erosion.	• Topography is somewhat more favorable, and no stream bank stabilization would be required.
• The C/D alignment would result in greater potential impacts to adjacent, privately owned woodlands. These contain some of the higher quality habitat in the Iowa River Valley and also contain some generally unique species of vegetation (paper birch).	• Although the C/D crossing variation would impact natural habitat, it is not of the higher quality and does not involve any unique plant species.
• This crossing is in the vicinity of an eagle roosting site and is adjacent to the Leverton Timber, another location of high quality forest habitat and part of the Hardin County greenbelt.	• Avoided by C/D crossing variation.
• Proposed alignment would require relocation of an active farmstead located just west of the Iowa River.	• Avoided by C/D crossing variation.

As shown above, the C/D alternative variation would avoid the most serious impacts of an Iowa River crossing within the generalized C/D corridor, and presents a more favorable alignment from an engineer perspective, which warrants inclusion of the variation as a viable option for highway construction.

Potential Measures to Minimize Harm and Proposed Mitigation for the C/D Variation Alignment:

Discussions with the Iowa Department of Natural Resources (title holder for the affected parcel) and the Hardin County Conservation Board (park administrator) resulted in the following recommendations for mitigation:

1. In kind replacement of Iowa River Greenbelt forest and pasture disturbed by highway construction on an acre-for-acre replacement basis, with replacement lands to be managed by either the state or county conservation agencies.

2. Reseeding and reforestation of disturbed sites based on the county conservation board's site specific recommendations.

3. Continuation of access from the north for maintenance vehicles and pedestrians.

If Alternative C\D variation is selected causing encroachment upon Sand Springs, these recommendations will be incorporated into the project mitigation plan and carried out as part of the project development plan.

Measures to minimize harm may include additional minor alignment shifts to further reduce proximity impacts near the park and reduction of overall right-of-way needs near the park by reducing the highway cross section at this location.

Coordination

Potential construction impacts and mitigation measures have been reviewed with the Hardin County Conservation Board and with the Iowa Department of Natural Resources. Additional review and consultation will be carried out to develop a final mitigation plan if either Alternative C or D is selected as the construction option.

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INDEX (cont.)

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