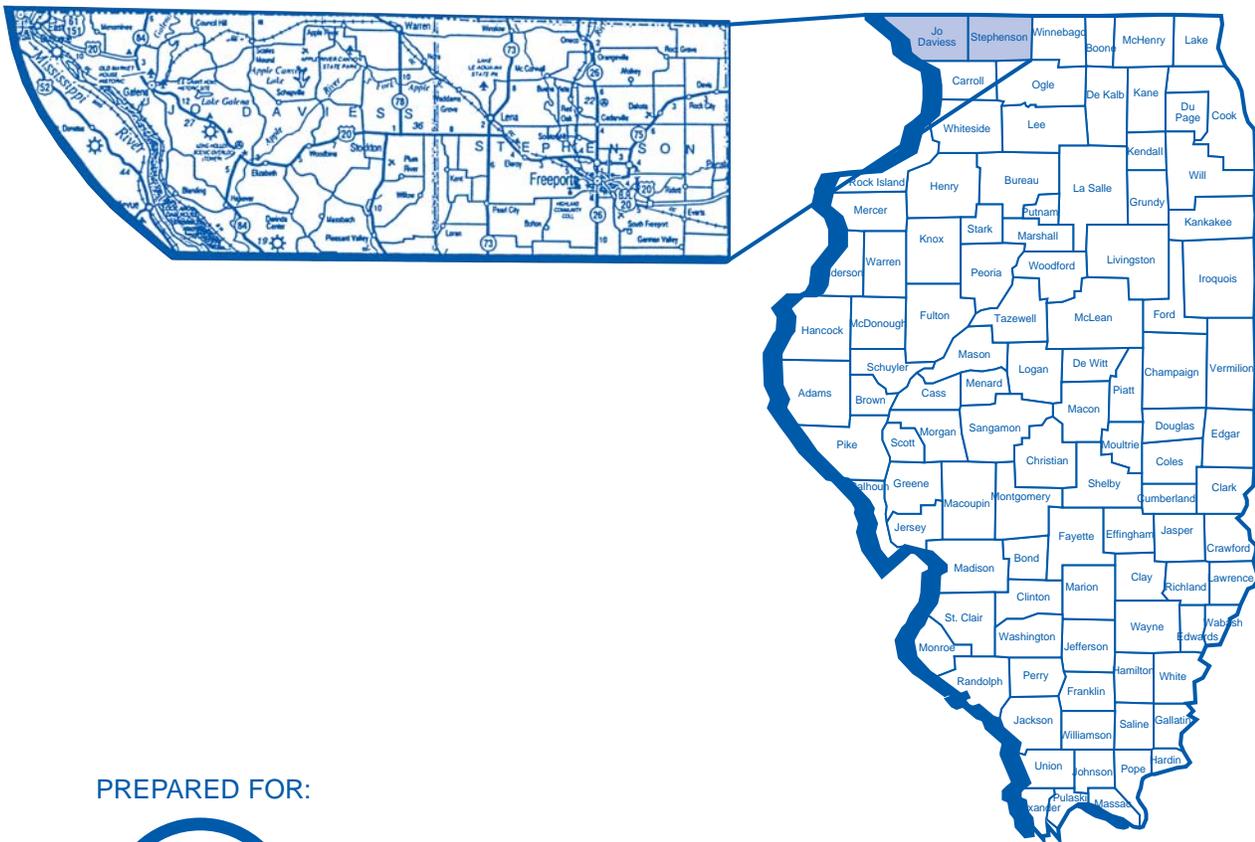


FINAL ENVIRONMENTAL IMPACT STATEMENT

U.S. ROUTE 20 (FAP 301) JO DAVIESS AND STEPHENSON COUNTIES



PREPARED FOR:



ILLINOIS DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS

U.S. ROUTE 20 (FAP 301)
FROM ILLINOIS ROUTE 84 NORTH OF GALENA
TO BOLTON ROAD NORTHWEST OF FREEPORT IN
JO DAVIESS AND STEPHENSON COUNTIES, ILLINOIS
FINAL
ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to 42 U.S.C. 4332(2)(c)
by the
Federal Highway Administration
U.S. Department of Transportation
and
Illinois Department of Transportation

Cooperating Agencies

U.S. Army Corps of Engineers
U.S. Environmental Protection Agency

11/16/04
Date of Approval

11/16/04
Date of Approval

U.S. Fish and Wildlife Service

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Abstract: The purpose of the proposed action is to provide an improved transportation system in Jo Daviess and Stephenson Counties, to provide a transportation facility that will properly address existing and projected system deficiencies and to improve the safety and efficiency of the existing transportation system. The proposed action will integrate the needs of increased development, system capacity, travel safety, community access, and system continuity. The Preferred Alternate will provide a high-type multi-lane highway with an appropriate connection to the four-lane facility west of Illinois Route 84, and extending 75.6 km (47 miles) to the east, connecting to a previously approved four-lane facility east of Bolton Road, northwest of Freeport.

The Preferred Alternate includes the displacement of 34 residences and 3 businesses. **Of the 34 residential displacements, 25 are farmsteads containing 103 buildings. Agricultural impacts include the loss of 842 acres of prime farmland, severance of 98 parcels and landlock 34 parcels. The project will require 2,760 acres of right-of-way. Natural resource impacts include the loss of 111 hectares (274 acres) of upland forest communities, fragment forested habitat for neotropical migrant species of birds, the loss of 1.47 hectares (3.63 acres) of wetlands, involve four longitudinal floodplain encroachments, the placement of 22,298 square meters (240,017 square feet) of fill into 12 base (100-year) floodplains and cause visual impacts in the Apple River area. Mitigation is being provided for upland forest, Neotropical migrants, and wetland impacts.**

TABLE OF CONTENTS

	Page
FOREWORD	F-1
Condensed Final EIS	F-1
Substantive DEIS Changes and Additions.....	F-1
1.0 PURPOSE OF AND NEED FOR ACTION	1-1
1.1 Purpose of Proposed Project	1-1
1.2 History	1-1
1.3 Need for Proposed Action	1-4
2.0 AFFECTED ENVIRONMENT	2-1
2.1 Project Area.....	2-1
2.2 Transportation Facilities	2-1
2.3 Social/Economic.....	2-2
2.4 Agriculture	2-5
2.5 Cultural Resources.....	2-5
2.6 Air Quality.....	2-6
2.7 Noise	2-6
2.8 Natural Resources.....	2-7
2.9 Surface Water Resources and Water Quality.....	2-10
2.10 Floodplains	2-14
2.11 Wetlands	2-15
2.12 Special Waste	2-15
2.13 Biological Resources.....	2-16
2.14 Visual/Aesthetics	2-21
3.0 PROJECT ALTERNATIVES	3-1
3.1 Project Alternatives Considered	3-1



TABLE OF CONTENTS (CONTINUED)

	Page
3.2 Project Alternatives Eliminated.....	3-14
3.3 Preferred Alternate	3-23
4.0 ENVIRONMENTAL CONSEQUENCES	4-1
4.1 Social/Economic.....	4-1
4.2 Agriculture	4-11
4.3 Cultural Resources.....	4-12
4.4 Air Quality.....	4-13
4.5 Noise	4-14
4.6 Natural Resources.....	4-15
4.6.1 Geology	4-15
4.6.2 Biological Resources	4-18
4.7 Surface Water Resources and Water Quality.....	4-24
4.8 Floodplains	4-27
4.9 Wetlands	4-30
4.10 Special Waste	4-33
4.11 Types of Permits	4-33
4.12 Visual/Aesthetics	4-34
4.13 Construction Impacts.....	4-35
4.14 Secondary and Cumulative Impacts.....	4-38
4.15 List of Commitments and Mitigation Measures.....	4-42
4.16 Short-Term Use and Long-Term Productivity Relationship.....	4-46
4.17 Irreversible and Irrecoverable Commitments of Resources	4-46
5.0 COMMENTS AND COORDINATION	5-1
5.1 Coordination with Federal and State Agencies	5-1
5.2 Public Involvement	5-1
5.3 Public Hearing	5-2



TABLE OF CONTENTS (CONTINUED)

	Page
5.4 DEIS Comment Responses	5-3
6.0 LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT WERE PROVIDED	6-1
6.1 Federal Agencies	6-1
6.2 State Agencies	6-1
6.3 Local Agencies	6-1
6.4 Agricultural Agencies.....	6-1
6.5 Organizations and Institutions	6-1
7.0 LIST OF PREPARERS	7-1
7.1 Federal Highway Administration (FHWA).....	7-1
7.2 Illinois Department of Transportation (Department)	7-1
7.3 Consultants	7-3
8.0 REFERENCES.....	8-1

APPENDIX A

- Public Hearing Documentation
- Resource Agency Coordination
- AD-1006 Forms
- NEPA/404 Merger Meeting Minutes
- Municipality Resolutions
- Draft Section 404 (b)(1) Evaluation Report
- Aerial Plan Sheets

LIST OF TABLES

Table 1-1	Existing U.S. Route 20 - Level of Service.....	1-8
Table 1-2	Crash Type and Number, 1984-2002.....	1-9
Table 1-3	Crash Type and Number Summary, 2000-2002.....	1-9
Table 2-1	Designated 100-Year Floodplains Within the Project Area	2-17
Table 3-1	Section Alternate Cross-Reference Matrices	3-17
Table 4-1	Access Changes for Farms and Residences, U.S. Route 20, Galena to Freeport, Summary Comparison of Alternates	4-4
Table 4-2	Property Displacements, U.S. Route 20, Galena to Freeport, Summary Comparison of Alternates	4-6



TABLE OF CONTENTS (CONTINUED)

	Page
Table 4-3	Summary of Construction Sales, Employment and Income Generation Associated with the Freeway and Expressway Alternates 4-8
Table 4-4	Tax Revenue Loss in 1997 Dollars by Alternate 4-9
Table 4-5	U.S. Route 20 Land Cover Conversion to Highway Use 4-10
Table 4-6	Agricultural Impacts for the Preferred Alternate 4-12
Table 4-7	Noise Impact Summary Tabel – Preferred Alternate 4-14
Table 4-8	Sensitivity of Aquifers to Contamination 4-18
Table 4-9	Summary of Cover Types Affected by Each Alternate 4-19
Table 4-10	Nesting Season Dates for Neotropical Migrants Known to Occur in the Project Area, Jo Daviess County, Illinois 4-21
Table 4-11	FEMA 100-Year Floodplain Impacts - Preferred Alternate 4-28
Table 4-12	100-Year Floodplain Impacts by Alternate 4-28
Table 4-13	Impacts to Wetlands by Alternate 4-31

LIST OF FIGURES

Figure 1-1	Project Area Map 1-2
Figure 1-2	Regional Map 1-3
Figure 1-3	Existing and Projected Design Hourly Volumes for U.S. Route 20 1-6
Figure 2-1	Carbonate and Non-Carbonate Bedrock in Relation to U.S. Route 20 Sections, Jo Daviess and Stephenson Counties, Illinois 2-11
Figure 2-2	Karst Features in Relation to U.S. Route 20 Sections, Jo Daviess and Stephenson Counties, Illinois 2-12
Figure 2-3	Aquifer Sensitivity Classifications in Relation to U.S. Route 20 Sections, Jo Daviess and Stephenson Counties, Illinois 2-13
Figure 3-1a	Section Map West 3-2
Figure 3-1b	Section Map East 3-3
Figure 3-1c	Sections C-D and D-E Detail 3-4
Figure 3-1d	Sections E-F (N) and E-F (S) Detail 3-5
Figure 3-1e	Sections G-H (N) and G-H (S) Detail 3-6
Figure 3-1f	Sections I-J, L-K, and J-K Detail 3-7
Figure 3-2	Proposed Typical Cross-Section – Freeway Alignment 3-18
Figure 3-3	Proposed Typical Cross-Section – Expressway Alignment 3-19
Figure 3-4	Proposed Typical Cross-Section – Tunnel Alignment 3-20
Figure 3-5a	Alternatives Considered and Rejected (West) 3-21
Figure 3-5b	Alternatives Considered and Rejected (East) 3-22
Figure 4-1	Public Facilities and Roadway Closures, Alternate 2: Galena-Woodbine 4-2
Figure 4-2	Public Facilities and Roadway Closures, Alternate 2: Woodbine-Freeport 4-3



FOREWORD

Condensed Final EIS

This section describes the intent, approach and organization used in this condensed Final Environmental Impact Statement (FEIS). The intent of this document is to make clear to the reviewer those changes and additions that have been made since the Draft Environmental Impact Statement (DEIS) was published. This is done by refraining from repeating the extensive material given in the DEIS in this document. Rather, the DEIS is incorporated by reference in this FEIS. Thus, changes and additions to the DEIS, which are presented in this FEIS, stand out clearly to the reviewer.

Each major section of the Final EIS will briefly summarize the important information contained in the corresponding section of the draft, reference the section of the draft that provides more detailed information, and discuss noteworthy changes that have occurred since the draft was circulated. Changes and additions are highlighted in bold.

Two new sections are added to Chapter 5.0 “Comments and Coordination”: Section 5.3 has been added to discuss the Public Hearing (one public hearing – two locations) while Section 5.4 presents the responses to the DEIS comments. Appendix A includes photocopies of comment letters from federal, state and local governmental agencies and organizations along with a listing of all individuals who commented on the project. The responses, which are given in Section 5.4 and organized by topic of discussion, are cross-referenced to each appropriate commenting party.

Substantive DEIS Changes and Additions

This FEIS includes discussion of the following substantive changes and additions from the DEIS:

- Additional studies on the potential impacts to Karst areas and groundwater quality issues.
- Mainline and sideroad alignment changes, and the associated right-of-way changes, required to bring the preliminary design into accordance with current State Design Standards (**IDOT Bureau of Design and Environment - BDE**). Included in Appendix A, Aerial Plan Sheets, is a summary of the alignment changes and only those plan sheets affected by the revisions.
- Sections 5.3 and 5.4 have been added to include the Public Hearing transcripts, comments made within 45 days of the Notice of Availability and final coordination issues (public involvement responses).
- Additional crash data have been added to supplement the findings in the DEIS.



1.0 PURPOSE OF AND NEED FOR ACTION

1.1 Purpose of Proposed Project

The purpose of the proposed project is to provide for an improved transportation system in Jo Daviess and Stephenson Counties through a transportation facility that properly addresses existing and projected system deficiencies and seeks to improve the safety and efficiency of the transportation system (Figure 1-1). This would include the high level of trip demands in Jo Daviess and Stephenson Counties caused by increasing community and economic development within the area. The proposed project should integrate the needs of increased development, system capacity, travel safety, community access, and system continuity.

The proposed project would provide a high-type highway with an appropriate connection to the four-lane facility west of Illinois Route 84, northwest of the city of Galena, and extend 47 miles to the east connecting to a previously approved four-lane facility east of Bolton Road, northwest of the city of Freeport (see Figure 1-2). This improvement and the Mississippi River crossing (Julien Dubuque Bridge) are the only remaining two-lane sections of U.S. Route 20 left to be studied for multi-lane improvements between Waterloo, Iowa and Rockford, Illinois. The Dubuque Metropolitan Area Transportation Study (DMATS) in cooperation with the Iowa Department of Transportation and the Illinois Department of Transportation (Department) is currently studying increasing the system capacity over the Mississippi River between Dubuque and East Dubuque.

The termini have been established so that U.S. Route 20 would function independently without forcing further improvements that may have impacts not addressed in the environmental studies, and so that the project would not restrict other future transportation improvements.

1.2 History

There has been a formal interest in modernizing U.S. Route 20 in northwestern Illinois since the interstate system took form. In 1963, the Illinois State Legislature responded to the interest in improving such routes as U.S. Route 20 by establishing the Transportation Study Commission (TSC). The TSC was charged with preparing a comprehensive study for modernizing the State's transportation system. The study was completed in 1967 and recommended a long-range program of development based on a complete network of arterial, collector and access routes throughout the State. To meet the future need for arterial routes, the study proposed the integration of planned federal interstate routes with a new State Supplemental Freeway System.

The 1967 TSC study identified a freeway location in the northwestern part of the state between Dubuque, Iowa and Rockford, Illinois. It was designated as Federal Aid Primary (FAP) Route 401 and closely paralleled U.S. Route 20 (U.S. Route 20 has subsequently been redesignated as FAP 301). A freeway in this location was based on the need to provide accessibility to interstate type service and improve east-west traffic service to this part of the state.

The latest stage in developing a comprehensive system of highways at the national level came with the passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). This federal legislation established a National Highway System to provide an interconnected system of principal arterial routes to serve interstate and interregional travel, meet national defense requirements, and serve major population centers, international border crossings, ports, airports, public transportation facilities, other intermodal transportation facilities, and major travel destinations. Among the highways included in the National Highway System are the



Figure 1-1 Project Area Map – T:\IDOT\1283\Reports\EIS\Volume1\Exhibits\Figure 1-1.dgn



Figure 1-2 Regional Map - T:\IDOT\1283\Reports\EIS\Volume\Exhibits\regional map.dgn



interstates. Other urban and rural principal arterials that fulfill the purposes of the system are also included in the system. U.S. Route 20 between Rockford and East Dubuque was included in the National Highway System on November 28, 1995.

U.S. Route 20 was included in the National Highway System because it continues to be a principal rural arterial serving the major population centers of Galena, the Galena Territory and the city of Freeport within Jo Daviess and Stephenson Counties. These interconnections provide access between the communities served by U.S. Route 20 and the major markets and business centers of the Midwest.

ISTEA authorized the study and/or implementation of specific demonstration projects. Section 1107 of ISTEA provides assistance for highway projects demonstrating innovative techniques of highway construction and finance. Environmental studies, preliminary engineering, and design studies for improving U.S. Route 20 to four lanes in Jo Daviess and Stephenson Counties is one of the projects authorized under Section 1107 of ISTEA.

1.3 Need for Proposed Action

The need for the proposed project is based on several aspects of the currently inadequate transportation system. The following sections address the need for the proposed action in terms of regional economic characteristics, system capacity, safety concerns, community access, and system continuity.

Regional Economic Characteristics

Recent increases in tourism and recreational related activities, a dramatic growth in the number of second homes, and shifts in employment trends in the southern and central regions of Jo Daviess County have resulted in a doubling of traffic on U.S. Route 20 over the past two decades. Local commuting patterns and increased truck travel have also contributed to the additional traffic on U.S. Route 20.

This region has experienced considerable increases in tourism in recent years. Tourism is a major economic generator with attractions such as the Galena National Historic District and the Apple River Canyon State Park. The Galena National Historic District is the third most popular tourist destination in the State, with an estimated one million visitors per year¹. The average attendance at Apple River Canyon State Park was 212,400 per year between 1991 and 1995². In addition to these attractions, a number of visitors from Illinois attend dog track racing and riverboat gambling in Dubuque, Iowa.

Substantial growth has occurred in the scenic and recreation-oriented tourism industry. The Chestnut Mountain Resort, south of the Galena Territory, and the Eagle Ridge Inn and Resort in the Galena Territory are two of the three largest employers in the county. Both resorts have hotels. The Galena Territory includes condominiums and second homes centered around lakes and golf courses. Chestnut Mountain has the region's largest skiing facilities. An estimated eighty-five percent of all homes in the Territory are second residences for people from the Chicago area. Growth is expected to continue in the second home communities of the Galena Territory and Apple Canyon Lake, another recreation-oriented development, located to the east. The Galena Territory is currently at 56 percent of capacity. Approximately 50 new homes are

¹ Source: Galena/Jo Daviess County Convention and Visitors Bureau

² Source: Illinois Department of Natural Resources



being built each year. It is expected that the area will reach 85 percent capacity by the year 2010. The first phase of Longhollow Point Resort, a 69-unit new condominium/hotel complex has been built near the entrance to Galena Territory; a total of 250-units are planned to be constructed. South of U.S. Route 20 and across from Longhollow Point Resort is the planned Saddleback development consisting of a golf course with commercial properties and a residential subdivision.

Other areas near the project are growing and are expected to continue this trend. Immediate plans for development in the city of Galena include a 41-hectare (102-acre) industrial park on the west side of the city as well as a 12-hectare (30-acre) mixed-use development and a 103 single family home subdivision on the east side of Galena. Industrial development is expected to continue in the areas south of the city of East Dubuque. Commercial development continues around Freeport.

In addition to the considerable increased travel due to the tourist attractions and development, there are more local trips and greater truck transport demand. Many workers commute to nearby regional employment centers from rural and semi-rural residences. Many residents use U.S. Route 20 to reach work destinations in Dubuque to the west and the cities of Freeport and Rockford to the east. Truck usage of U.S. Route 20 has continually increased through the past decades, since it is the only major east-west highway in the area.

System Capacity

The need for a four-lane facility to serve Jo Daviess and Stephenson Counties was identified in the 1960s. Since then, travel demand along U.S. Route 20 in this region has grown substantially. Measured in terms of Average Daily Traffic (ADT), travel demand along existing U.S. Route 20 has more than doubled on most segments between 1965 and 2003 despite the relatively stable population levels. Traffic volumes on the westernmost 60 percent of the highway grew during the period from 1985 to 1993 at an average annual rate of nearly 5.5 percent (compounded annually). The section of U.S. Route 20 between Illinois Route 73 and the city of Freeport experienced a similar rate of growth.

The growth in travel demand on U.S. Route 20 can be attributed to several factors, all of which are related to the functions served by the highway, as well as national trends. One of these factors is increased interregional travel, in particular truck travel, as the trucking industry has accounted for an increasing share of goods movement since the 1960's. Completion of major segments of the interstate highway system in the 1970's provided a large boost to the use of trucks to transport freight. Travel by commercial truck has continued to grow ever since. Another component of interregional travel is rail travel, both for handling freight and passenger traffic. The handling of freight by rail is still used in the transportation of goods in northwestern Illinois/northeastern Iowa. However, passenger rail service was halted in 1981 due to low ridership.

This growth in travel demand has increasingly affected traffic flow. This is particularly true during summer and fall weekends when additional travel demand by tourists and part-time residents frequently exceeds the roadway's capacity, resulting in extensive backups.

Existing traffic and traffic projections for existing U.S. Route 20 for the year 2020 indicate the need for a four-lane facility (Figure 1-3). Traffic projections, as developed by the Department using a growth rate of 3.36 percent, were based on existing traffic conditions (traffic counts) along existing U.S. Route 20 in Jo Daviess and Stephenson Counties during summer and fall 1993 and spring and summer 1994. According to the latest Department criteria, a four-lane



Figure 1-3 Existing and Projected Design Hourly Volumes For U.S. Route 20 –
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facility is warranted when traffic reaches a two-way Design Hourly Volume (DHV) of 800. The DHV is a measure representing the 30th maximum hour (30HV) in the Design Year. As shown in Figure 1-3, almost all of the sections of existing U.S. Route 20 between Galena and Freeport have a current 30HV that already meets four-lane warrants with the projected Design Hourly Volume far exceeding the warrants. In addition, truck travel in general is expected to continue to grow, even though the existing U.S. Route 20 geometrics were not designed to accommodate the larger trucks that are coming into greater use by the trucking industry.

Increased traffic volumes lower the “level of service” of U.S. Route 20. Level of Service (LOS) is a qualitative measure describing operational conditions within a traffic stream. LOS ratings for a mainline facility are measured with an A as best and a F as worst. Please see Table 1-1 for existing U.S. Route 20 LOS and detailed definitions. Current Department design criteria require at least a LOS of B for a major rural highway.

Safety Concerns

U.S. Route 20 in the project area was constructed through a corridor where topographic and geologic features are characterized by undulating terrain, with steep ridges and narrow valleys and bedrock strata that lie close to the surface. These physical conditions directly influenced the highway’s alignment configuration, which often followed the existing contours of the area’s ridges and valleys. Further, the past era’s roadway design standards are not adequate for today’s higher performance vehicles, truck class dimensions, and overall traffic volumes.

The existing geometry of U.S. Route 20 also reduces the efficiency to move people and goods through the region. Traffic backups develop at many locations behind slow moving vehicles, a result of extensive lengths of no-passing zones, restricted sight distances, steep grades and, generally, only one travel lane operating in each direction. Furthermore, many of the advisory speeds for substandard sections of U.S. Route 20 are at least 25 percent lower than the typical regulated speed of 80 kph (55 mph) for a rural major arterial. This has increased travel time between the U.S. Route 20/Illinois Route 84 intersection on the west and Freeport on the east.

Consequently, most of existing U.S. Route 20 (approximately 73 percent) between Galena and Freeport does not meet the Department’s current design standards for a rural highway. Nearly 50 percent of existing U.S. Route 20 between Galena and Freeport is comprised of vertical and horizontal curves that do not meet the Department’s current standards for a 90 kph (65 mph) design speed for rural highways. In addition, more than 10 percent of this section has grades steeper than the maximum grade allowed for a roadway to remain in place.

According to current Department design standards for a two-lane roadway, passing sight distance (passing zones) should be available for at least 40 percent of a roadway’s length. Along eastbound U.S. Route 20, passing zones account for only 34 percent of the roadway, while along westbound U.S. Route 20, passing is permitted along only 37 percent of the roadway. Actual passing opportunities are available much less than these percentages due to the high volume of traffic. In addition, many of the at-grade intersections within the project limits have substandard turning radii, sight distances, grades and capacity. Shoulders adjacent to the majority of the U.S. Route 20 pavement are either minimal or non-existent.

Crash data has been reviewed for a period covering 1984 through **2002**. As shown in Table 1-2, over the **19**-year period from 1984 to **2002**, a total of **3,942** crashes have been reported along U.S. Route 20 in the project area. **For crash data 2000-2002, see Table 1-3.**



**TABLE 1-1
EXISTING U.S. ROUTE 20 - LEVEL OF SERVICE
Two Lane, General Segment Analysis**

SEGMENT	1993				2010 LOS				2020 LOS				% Trucks	30th Max Hour as % of ADT
	Existing Conditions				Projected Conditions				Projected Conditions					
	30HV	ADT	% NPZ	LOS	30HV	ADT	% NPZ	LOS	DHV	ADT	% NPZ	LOS		
ILLINOIS ROUTE 84 (N) to Galena ECL	1,035	9,000	88	E	1,788	15,550	20	E	2,300	20,000	20	F	7.1%	11.5
Galena ECL to Wachter Rd.	1,020	6,800	71	E	1,770	11,800	20	E	2,280	15,200	20	F	6.6	15
Wachter Rd. to ILLINOIS ROUTE 84 (S)	855	5,700	94	D	1,470	9,800	20	E	1,890	12,600	20	E	7.9	15
ILLINOIS ROUTE 84 (S) to Derinda Rd.	810	5,400	62	D	1,388	9,250	20	E	1,785	11,900	20	E	8.1	15
Derinda Rd. to IL 78 (S)	780	5,200	56	D	1,350	9,000	20	E	1,740	11,600	20	E	8.3	15
IL 78 (S) to IL 78 (N)	930	6,200	4	C	1,598	10,650	4	E	2,055	13,700	4	E	8.0	15
IL 78 (N) to ILLINOIS ROUTE 73	780	5,200	69	C	1,350	9,000	20	D	1,740	11,600	20	E	9.2	15
ILLINOIS ROUTE 73 to U.S. Route 20 bypass	1,100	8,800	44	D	1,894	15,150	20	E	2,440	19,500	20	E	6.3	12.5

Definitions: DHV - Design Hourly Volume
 LOS - Level of Service
 % NPZ - Approximate Percent No Passing Zone
 30HV - 30th Highest Hourly Volume

Notes: Projected conditions assume that a 4-lane highway is not built; however, it does assume that the Department's current policy of maintenance and roadway improvements will continue; for calculation purposes 20% maximum no passing zones assumed for years 2010 and 2020.

The basis for the traffic analysis is a twenty-year design commencing at the start of the study period. Travel patterns in the region have not been meaningfully altered during the development of this DEIS and continue to indicate a need for the project.

- LOS A - Describes free flow conditions. Operation of vehicles is virtually unaffected by the presence of other traffic.
- LOS B - Generally, free flow conditions, although presence of other vehicles begins to be noticeable.
- LOS C - Influences of traffic density on operations become marked.
- LOS D - Borders on unstable traffic flow. Ability to maneuver is severely restricted.
- LOS E - Unstable flow, little to no maneuverability and increased amount of stoppage.
- LOS F - Flow breakdown. Demand exceeds capacity.



**TABLE 1-2
CRASH TYPE AND NUMBER, 1984-2002**

ACCIDENT TYPE	NUMBER OF OCCURRENCES																			
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	TOTAL
ANGLE	4	6	3	8	8	7	7	8	8	7	16	20	NA	19	16	27	10	14	15	203
ANIMAL	21	29	34	40	42	45	62	60	45	47	33	52	NA	46	32	50	39	49	61	787
BICYCLIST	0	0	0	0	0	1	0	0	0	0	0	0	NA	0	0	0	0	0	0	1
FIXED OBJECT	41	41	56	48	42	51	42	40	36	38	33	48	NA	44	36	23	38	28	33	718
HEAD ON	9	8	7	7	5	4	11	6	4	5	7	3	NA	2	3	4	4	1	4	94
OVERTURNED	9	8	19	15	15	12	18	13	14	9	8	10	NA	8	10	5	12	12	12	209
PARKED VEHICLE	3	3	5	2	0	3	2	2	5	2	2	2	NA	2	1	2	1	1	7	45
PEDESTRIAN	0	0	2	1	0	0	0	1	0	0	0	0	NA	1	0	0	0	0	1	6
REAR END	19	32	42	35	27	42	45	45	33	51	64	59	NA	66	71	69	72	53	57	882
SIDESWIPE	15	14	12	12	14	11	21	15	20	17	5	9	NA	13	13	17	8	8	6	230
TURNING	19	28	22	12	20	19	24	25	29	23	18	16	NA	12	9	3	9	17	21	326
OTHER	9	20	12	10	12	20	10	18	17	7	15	12	NA	9	17	14	15	7	11	235
TOTAL INJURED	49	81	96	95	77	79	140	95	100	95	122	110	NA	72	113	83	78	56	85	1626
FATALITIES	4	2	2	4	3	3	3	3	1	1	6	0	NA	2	1	7	3	4	2	51
TOTAL ACCIDENTS	149	189	214	190	185	215	242	233	211	206	201	231	207	222	208	214	208	190	228	3943

Source: Illinois Department of Transportation, 2004.

**TABLE 1-3
CRASH TYPE AND NUMBER SUMMARY, 2000-2002**

CRASH	CRASH TOTALS				PERCENTAGES			
	YEARLY			PERIOD	YEARLY			PERIOD
	2000	2001	2002	2000-2002	2000	2001	2002	2000-2002
A. ANGLE	10	14	15	39	4.81%	7.37%	6.58%	6.23%
B. ANIMAL	39	49	61	149	18.75%	25.79%	26.75%	23.80%
C. FIXED OBJECT	38	28	33	99	18.27%	14.74%	14.47%	15.81%
D. HEAD ON	4	1	4	9	1.92%	0.53%	1.75%	1.44%
E. OTHER NON-COLLISION	4	0	5	9	1.92%	0.00%	2.19%	1.44%
F. OTHER OBJECT	11	7	6	24	5.29%	3.68%	2.63%	3.83%
G. OVERTURNED	12	12	12	36	5.77%	6.32%	5.26%	5.75%
H. PARKED VEHICLE	1	1	7	9	0.48%	0.53%	3.07%	1.44%
I. PEDESTRIAN	0	0	1	1	0.00%	0.00%	0.44%	0.16%
J. REAR END	72	53	57	182	34.62%	27.89%	25.00%	29.07%
K. SIDESWIPE – SAME DIRECTION	4	8	5	17	1.92%	4.21%	2.19%	2.72%
L. SIDESWIPE – OPPOSITE DIRECTION	4	0	1	5	1.92%	0.00%	0.44%	0.80%
M. TURNING	9	17	21	47	4.33%	8.95%	9.21%	7.51%
TOTAL INJURED	78	56	85	219	37.50%	29.47%	37.28%	34.98%
FATALITIES	3	4	2	9	1.44%	2.11%	0.88%	1.44%
TOTAL CRASHES	208	190	228	626	100.00%	100.00%	100.00%	100.00%

Source: Illinois Department of Transportation, 2004.



From an operational perspective, U.S. Route 20's history of relatively high crash rates is indicative of substandard roadway geometry. The number of high crash locations along U.S. Route 20 between the city of Galena and the city of Freeport has been higher for the 3-year period from 1989 to 1991 than for highways in the State as a whole. The locations were numbered 9, 11, and 10, respectively, for each of the three years and were included in the top 1,000 high crash locations statewide outside of the Chicago metropolitan area.

Over the 19-year period between 1984 and **2002**, a total of **3,942** reported crashes occurred within the project area. Of this total, vehicles leaving the roadway accounted for approximately **one-third (33 percent)** of the total crashes, while rear-end and turning/angle collisions accounted for an additional **36 percent** of the total crashes. These types of crashes typically coincide with the types of roadway conditions that characterize substantial sections of U.S. Route 20, including substandard horizontal alignments, inadequate shoulder widths, restricted sight distances, and conflicting turning movements at intersection and driveway locations.

Throughout the study period, both crash rates and crash frequencies have been consistently above the statewide averages for similar facilities. Crash frequencies (crashes per mile) have increased at a rate of about one percent per year. Although crash rates (crashes per vehicle-mile of travel) have decreased slightly, they remain higher than the statewide average.

Animal hits, predominantly deer, account for over **21 percent** of the total crashes along U.S. Route 20 during this period. The limited sight distances and substandard shoulder widths that currently exist restrict drivers' reaction time and limit vehicle maneuverability. These deficiencies help contribute to the high number of animal/vehicle collisions and vehicles leaving the roadway. What is not noted is the number of crashes caused by near animal hits. With the high volume of traffic on U.S. Route 20 and the limited room to maneuver, defensive maneuvers to avoid hitting a deer, or any other animal, can contribute to these crashes.

Aside from geometric deficiencies, the number of crashes occurring along U.S. Route 20 can also be attributed to the higher than optimum traffic volumes. As the design hourly volume (DHV) continues to increase along U.S. Route 20, the level of service continues to decline. A level of service of B provides for stable operations and is the minimum level of service that is desired. According to the latest Department criteria, a LOS of B can be maintained on a two-lane facility with a two-way DHV of 800 or less. With the current DHV ranging from 780 to 1100 vehicles per hour, almost all segments of U.S. Route 20 are already exceeding such a level of service. This has several detrimental effects on the drivers' safety. The number of vehicles on the road at one time causes a reduction in the drivers' physical and psychological comfort including less time to physically react to movements of other vehicles, reduced driver comfort within the congested traffic stream, and driver overcompensation. The increased congestion may also result in drivers taking unnecessary risks.

Although many of the crashes along U.S. Route 20 may be attributable to geometric deficiencies, straightening the curves and widening the shoulders will not correct all the safety problems along this section of U.S. Route 20. The Department has already made geometric improvements to many sections of U. S. Route 20, which had higher numbers of crashes, but the number of sections along U.S. Route 20 on the Department's High Crash Location list still remains relatively constant.

Geometric improvements have removed some sections from the high crash list; however, the number of sections taken off the list is equalized by the number of new sections along U.S. Route 20 that have been added to the list. The most likely cause for this equalization is the



higher traffic volumes. To reduce the total number of sections along U.S. Route 20 on the high crash location list, a combination of geometric improvements and traffic capacity improvements is required.

The above data and information indicate a geographical relationship between high crash locations and locations of substandard geometry along U.S. Route 20. The lack of design consistency, deficient geometrics, and traffic conflicts created at numerous intersections and driveway locations characterize U.S. Route 20 between Galena and Freeport.

Community Access

An additional need for the proposed project is to improve access between the communities located along U.S. Route 20 and to improve access between Jo Daviess and Stephenson Counties and the metropolitan areas and markets in Illinois and the surrounding states. An overview of the existing road network shows that U.S. Route 20 is an integral part of the local road system. This is caused by the topography of the area, which does not lend itself to a grid roadway network typical in other areas of Illinois. As part of the local road system, U.S. Route 20 experiences a varied traffic mix. Vehicles using the roadway include farmers moving their equipment from farmstead to field; school buses picking up children in the outlying areas and taking them to schools in the city of Galena, the villages of Elizabeth, Stockton, Lena and the city of Freeport; residents in the outlying areas traveling to the services provided in the communities; and through traffic making interregional trips.

Traffic along existing U.S. Route 20 has continued to increase as a result of local travel demand. As stated, U.S. Route 20 serves as a major link between many of the communities in both Jo Daviess and Stephenson Counties, particularly for those households that depend on the private automobile and truck for work, leisure and shopping activities, as well as for businesses moving their products from farm to market. This increase in local travel demand has been the result of several factors. Non-farm employment in Jo Daviess and Stephenson Counties has increased by approximately 5,800 jobs between 1980 and 1997 while farm employment has decreased by approximately 1,480 jobs in the same time period. The number of housing units in the counties has increased by 4,731 between 1980 and 2000. Comparable job growth in the nearby regional centers of Rockford and Dubuque (Figure 1-2) has also occurred. The city of Galena, the Galena Territory, the various recreational resorts, the villages of Eleroy, Lena, Elizabeth, and Stockton and the township of Woodbine all provide employment and service opportunities to the residents of Jo Daviess and Stephenson Counties.

Examples of local traffic demand include the dairy farmer in the western portions of Jo Daviess County delivering milk to the dairy processing plants in the village of Stockton. The dairy products are then shipped from Stockton to markets in Wisconsin and Eastern Illinois. A major lumber company in Eleroy receives raw lumber from suppliers in the west and produces roof trusses and prefabricated walls for delivery to markets in the Chicago area and Iowa. The village of Lena provides additional workforce for the commercial and industrial businesses in Freeport. As the businesses and recreational areas continue to grow and serve the region, the need for an improved and expanded roadway facility linking these areas becomes more important.

System Continuity

The Department's Office of Planning and Programming classifies U.S. Route 20 as a Major Arterial Highway within the rural State highway system. In general, major arterials are expected to provide a high degree of mobility and, therefore, should permit high operation speeds and



direct routing to favor the longer trip lengths. In terms of service characteristics, the Major Arterial Highway system is intended to: (1) link cities, large towns, and other "long distance trip" traffic generators (such as resort areas); (2) provide internal spacing consistent with land use and population density patterns, such that all developed areas in the State are within reasonable distances of the highway network; and (3) integrate interstate and inter-county service.

The 47-mile portion of U.S. Route 20 from Illinois Route 84 and Galena to Freeport is the last remaining two-lane section of U.S. Route 20 between Waterloo, Iowa and Rockford, Illinois, other than the Julien Dubuque Bridge across the Mississippi River. Increasing the capacity of the bridge is currently under study by DMATS in cooperation with the Iowa Department of Transportation and the Department. East of Rockford, the east-west travel function is provided by I-90 that essentially extends the nearly continuous four-lane east-west corridor provided by U.S. Route 20 to Chicago and points east.

U.S. Route 20 in northwest Illinois also serves to link important north-south roadways and population centers in the region. These interconnections provide access between the communities served by U.S. Route 20 to the major markets and business centers of the Midwest. In particular, U.S. Route 20 (near Waterloo, Iowa) would connect to the selected "Avenue of the Saints," an interstate-level highway linking St. Louis, Missouri and St. Paul, Minnesota. In addition to these interconnections, U.S. Route 20 via the link with Illinois Route 84, west of the village of Elizabeth in Jo Daviess County serves the Savanna Army Depot, which is being redeveloped to include commercial, residential, and industrial uses.

The proposed project is needed to complete the missing four-lane section on U.S. Route 20 between Galena and the Freeport Bypass. Upon completion of this project and the Mississippi Bridge at Dubuque, U.S. Route 20 would have continuous four-lane capacity from northwestern Illinois to northern Iowa (from Rockford to Waterloo).



2.0 AFFECTED ENVIRONMENT

2.1 Project Area

The general project area is comprised of the two county area of northwest Illinois which includes Jo Daviess and Stephenson Counties. The project area extends from just west of Illinois Route 84, northwest of the city of Galena to approximately 47 miles to the east near Bolton Road, northwest of the city of Freeport. The project area is primarily agricultural, with pockets of residential and commercial development. Concentrated areas of residential and commercial development are located within the corporate limits of Galena, the Galena Territory, Freeport and the villages of Elizabeth, Stockton and Lena. Although the project area is agriculture in nature, the area is experiencing increased patronage to the recreational facilities and residential communities, which serve as second homes for an increasing number of residents from the greater Chicago Metropolitan Area.

2.2 Transportation Facilities

Roadway Facilities

Existing Roadway Facilities

U.S. Route 20 provides interstate service to the motoring public. Two transcontinental through routes are parallel and in proximity to U.S. Route 20, namely, Interstate Route 80, generally to the south, and Interstate Route 90, generally to the north. However, at Rockford, Interstate 90 deviates from its general east-west orientation and proceeds north through Madison into central Wisconsin, at which point it returns to an east-west orientation. As a result, U.S. Route 20 in Jo Daviess and Stephenson Counties is separated from Interstate Route 90 by approximately 100 miles. Meanwhile, Interstate Route 80 is approximately 75 miles south of this area. The nearest interstate highway to this area is Interstate Route 88, approximately 50 miles south of Stockton, an alternate route to I-80, and largely a tollway, for travel between the Quad Cities and Chicago. Therefore, U.S. Route 20 is the only major east-west roadway that serves Jo Daviess and Stephenson Counties.

Proposed Roadway Facilities

There has been a formal interest in modernizing U.S. Route 20 in northwestern Illinois since the interstate system took form. The Department is currently studying the upgrade of U.S. Route 20 from East Dubuque to Illinois Route 84 from a four-lane expressway to a freeway. At the eastern terminus of the project area, the Freeport Bypass is currently a two-lane roadway. The Department has plans to complete the staged construction of the bypass to a four-lane freeway. Resurfacing, rehabilitation, and restoration (3R) type improvements are ongoing along U.S. Route 20, and the Department will continue to do so. No other major improvements are proposed in the project area.



2.3 Social/Economic

Social Characteristics

Jo Daviess County is the northwestern most Illinois county having a population of 22,289 with having 98.7 percent white and 0.3 percent minority population³. The median income for the county was \$48,335.

Stephenson County located next to Jo Daviess to the east has a population of 48,979 of which 89.3 percent is white and has a 7.8 percent minority population. The median family income was \$40,510.

Galena is situated in western Jo Daviess County, which forms the northwestern corner of Illinois, bordering on Wisconsin to the north and the Mississippi River to the west. This city of 3,460 residents is rich in history with the home of the 18th President of the United States, Ulysses S. Grant and 85 percent of Galena listed in the National Register of Historic Places. The population consists of 98 percent white and 0.8 percent minority. The median family income was \$44,063.

The village of Elizabeth, population 682, is nestled in the middle of the rolling hill country of scenic Jo Daviess County. Of the 682, 99 percent is white with a 0.3 percent minority population. The median family income was \$41,173.

The township of Woodbine, located just east of Elizabeth, has a population of 577, of which 99.3 percent is white. The minority population is 0.5 percent. The median family income for Woodbine was \$31,403.

The village of Stockton is located in the eastern portion of Jo Daviess County with a population of 1,926. The population consists of 99.7 percent white and 0.1 percent minority. The median family income was \$43,173.

Lena is located approximately 9 miles west of Freeport, Illinois and in western Stephenson County. The population of Lena is 2,887 with 98.6 percent white and 0.3 percent minority. The median family income of Lena was \$49,375.

The city of Freeport, located in the center of Stephenson County, had a population 26,443. Of this 26,443, 81.8 percent is white and 15 percent is minority. The median family income was \$43,787.

Public Services and Facilities

Each city or village within the project area operates its own police and fire protection. For police services, unincorporated and rural areas are protected by the Jo Daviess or Stephenson County Sheriff's departments. For fire protection, fire districts are set up to incorporate rural and unincorporated areas in each county. In Jo Daviess County, the Galena-Strauss Hospital and Nursing Care Facility offers a 29-bed hospital and 60 long-term care beds. In Stephenson County, a 171-bed hospital is located in Freeport.

Public schools in Jo Daviess, Stephenson and Carroll Counties are operated under the jurisdiction of the Regional Office of Education. Each city or village within the project area has a

³ All census data is from the U.S. Census Bureau, Census 2000.



public school district. **Figures 2-1 and 2-2 of the Draft EIS depict the locations of the public facilities in the project area.**

Economic Characteristics

Jo Daviess County is predominantly rural in nature. Economically, the county has had three basic export industries, each of which reflects a different economic period in America. Mining began during the first half of the 19th century, but little of this employment still exists in the project area. Agriculture has been the mainstay of the county's economy for over 100 years, with dairying and beef cattle production being the main focus. The third industry, manufacturing, emerged primarily after World War II, in the form of foundries and other similar facilities. The county's newest industry is recreation and tourism.

Stephenson County is also predominantly rural. Established in 1837, early economic activity in the county consisted of agriculture and fur trading. Industry in the county is concentrated in the City of Freeport, the county seat, although many of the smaller communities also have some industrial operations. The leading industries in the county include agriculture, food manufacturing and processing (including milk and milk products), lumber and wood products and agricultural services. Agriculture is the county's major industry, largely because of the high percentage of productive soils, favorable climate and good transportation facilities. Incorporated communities located within the project area include the village of Lena and the city of Freeport. Lena is a small farm village that provides services to the immediate rural community, while Freeport is the retail and manufacturing hub of Stephenson County.

Incorporated communities located within the project area include the city of Galena and the villages of Elizabeth and Stockton. In the early 1800s, Galena became the lead mining center of the country, as well as a major river port and center for commerce. Many of the buildings of the day survive to the present, which has resulted in the city's designation as a National Historic District and being placed on the National Register of Historic Places. Elizabeth is the center of the county's agricultural economy, serving as a major distribution point for livestock feed, fertilizer, agricultural limestone and fuel. Also located in Elizabeth are the majority of the food, clothing, appliance and hardware facilities that are utilized by the county's farming community. Stockton is also an important farm community, albeit on a smaller scale than Elizabeth. Manufacturing is important to Stockton as it is the birthplace of the Kraft Company.

Jo Daviess County had a nearly 13 percent decrease in labor force from 1980 to 1990, and then a 19.4 percent increase from 1990 to 2000, resulting in a 4.0 percent increase between 1980 and 2000. Compared to Jo Daviess County, Stephenson County experienced a steady decline in labor force during the two periods: a 2.5 percent decrease from 1980 to 1990 and a 0.6 percent decrease from 1990 to 2000. The labor force situation in the two counties between 1980 and 2000 was largely attributed to the population decline during the same period. In fact, from 1980 to 2000, total population dropped by 5.2 percent for Jo Daviess County and by 1.1 percent for Stephenson County.

Overall, the unemployment rates for the two counties and the state had been steadily declining since the mid 1980s despite a small increase in the early 1990s. From 1980 to 2000, the unemployment rates fell from 8.8 to 4.4 percent for Jo Daviess County and from 7 to 6.3 percent for Stephenson County, compared to the decline from 8.3 to 4.4 percent for the State of Illinois.

The differences in employment characteristics between the two counties are reflected in the geographical mobility and place of work for their resident workers. According to the Census data, in 2000, Jo Daviess County had 38.5 percent of its residents working outside the county, including 24.5 percent of its residents working outside the State of Illinois.



Unlike Jo Daviess County, the majority of residents in Stephenson County (79.6 percent) were employed inside the county in 2000.

Between 1989 and 1999, real median household income rose modestly in both Jo Daviess and Stephenson Counties and in the State of Illinois. Median household income increased for both Jo Daviess and Stephenson Counties by 10.0 percent and 4.2 percent respectively, compared to a 5.7 percent increase for the State of Illinois. Among the municipalities in Jo Daviess and Stephenson Counties, only Elizabeth experienced a decrease in median household income (5.7 percent), while Galena had the largest rise in median household income at 17.9 percent.

With respect to poverty, in the 2000 U.S. Census, 682 households in Jo Daviess County (7.4 percent) reported income below the poverty level (\$17,029 for a family of four), while in Stephenson County the figure was 1,807 households (9.1 percent).

Land Use and Development Trends

Currently, U.S. Route 20 is the principal highway connecting the cities of Rockford and Chicago to the east and the city of Dubuque, Iowa to the west. The largest land use patterns in the project area are agricultural and undeveloped lands. Existing land use patterns in the project area have also been largely influenced by topographic features. Although residential land use exists throughout the project area to varying degrees, areas of concentrated residential development are located near the developed centers along the U.S. Route 20 corridor, such as in the city of Galena, the Galena Territory and the villages of Elizabeth and Stockton.

In July 2000, Stephenson County revised its Future Land Use Plan, while Jo Daviess revised its Future Land Use Plan on September 14, 1999. Of the individual communities within the project area, only the city of Galena prepared a comprehensive plan. The Comprehensive Plan of Galena was prepared in 1991 and updated in April 2003. This plan encouraged the restoration and residential reuse of structures within the historic residential neighborhood as well as new residential development on existing platted and serviced lots before new residential subdivisions. The city of Freeport has not updated its current comprehensive plan. However, according to local planning officials, the latest Freeport Comprehensive Plan is considered to be consistent with the goals and objectives of the latest Stephenson County Comprehensive Plan.

Population projections through the year 2020 for Jo Daviess County show only a two percent overall change in population. Although the population is not expected to increase substantially, Jo Daviess County has been experiencing a considerable increase in residential development catering to the second homebuyer.

For Stephenson County, the overall increase in population through the year 2020 is projected to be approximately one percent. Unlike Jo Daviess County, Stephenson County does not have a substantial second home market. Therefore, according to the county, little land use change is expected throughout the county. Stephenson County is organized into sixteen districts within the five broad categories of agricultural, residence, business, manufacturing, and tourist districts. For much of the county, agricultural land predominates although much of the land throughout the county is considered floodplain. Most residential zoning within the project area is located within Freeport and Lena.



2.4 Agriculture

The proposed project lies within an area that is predominantly agricultural in nature and has been farmed or grazed since the mid-1800s. The farming and dairy industries in Jo Daviess and Stephenson Counties are an important economic force as well as an important life-style. Of the 160,249 hectares (395,985 acres) in Jo Daviess County, farmland comprises about 72 percent and of the 147,111 hectares (363,520 acres) in Stephenson County, farmland comprises about 85 percent. Within the project area, over 54 percent of the land is agricultural, while an additional 26 percent of the land is considered as scattered agricultural land (pasture and hayfields). Prime farmland accounts for 26 and 40 percent of the land in Jo Daviess and Stephenson Counties, respectively. In addition, important farmland accounts for 40 and 12 percent of the land in Jo Daviess and Stephenson Counties, respectively.

The Farmland Protection Act of 1981 protects prime farmland, as defined by U.S. Department of Agriculture (USDA), excluding land already in or "committed" to urban development or water storage and excludes all farmland within the official 2.4-kilometer (1.5-mile) planning area of an incorporated municipality. Only Galena and Freeport, of the affected municipalities within the project area, meet the conditions of this act. The project also considered Centennial and Sesquicentennial Farms. Three farms in the project area qualify as Centennial Farms. No farms qualify as Sesquicentennial Farms.

Coordination with the Illinois Department of Agriculture (IDOA) and the Natural Resources Conservation Service (NRCS) are contained in Appendix A and has been ongoing since the beginning of the project. The IDOA requested that the EIS contain information that was included in their 10 September 1993 letter. This information was addressed in the Agricultural Resources Technical Report and summarized in the Draft and Final EIS. In the IDOA letter dated 29 May 2001, IDOA stated that the Department has done a very thorough job of assessing the project's agricultural impacts. The Department requested that the NRCS, and subsequently the IDOA, complete the AD-1006 form in August 2001. Results of the AD-1006 may be found in Section 4.2 of this FEIS.

2.5 Cultural Resources

Over 1,618.7 hectares (4,000 acres) of the project area have been surveyed to date (this excludes areas which were disturbed, wetlands, and properties where access was denied). Of the 222 archaeological sites, which have so far been recorded in the project area, 77 percent are isolated finds of prehistoric stone tools and prehistoric lithic scatters confined to the disturbed plow zone. Historic period archaeological sites recorded include abandoned lead mines, the remains of 19th Century farmsteads, and a 19th Century pottery works. Hundreds of pits and tailings piles have been found in unglaciated uplands around Galena and underscore the early importance of lead mining in this area of northwestern Illinois.

Some 300 historic period standing structures in the project area have been photographed, and initial determinations concerning National Register eligibility have been made by professional architectural historians so that properties which are potentially meaningful can be avoided during project planning (as depicted in Appendix N of the DEIS). Three historic buildings currently listed on the National Register are located in the project area. These properties, all situated between Freeport and Lena, consist of examples of a particular architectural type of round barn which dates to the late 19th Century. Two historic period Euro-American cemeteries also have been recorded in the project area.



2.6 Air Quality

All areas of Illinois are currently in attainment of the standards for four of the six criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. For the 1-hour ozone standard, Chicago is classified as a severe nonattainment area and Jersey, Madison, Monroe, and St. Clair Counties are classified as maintenance areas for that standard. The Chicago nonattainment areas include Cook, DuPage, Kane, Lake, McHenry, and Will Counties, Aux Sable and Goose Lake Townships in Grundy County, and Oswego Township in Kendall County.

For the 8-hour ozone standard, Cook, DuPage, Lake, McHenry, and Will Counties, Aux Sable and Goose Lake Townships in Grundy County and Oswego Township in Kendall County, have been designated as moderate nonattainment areas. Jersey, Madison, Monroe, and St. Clair Counties in the St. Louis area also have been designated as moderate nonattainment areas for the 8-hour ozone standard.

The Lake Calumet area and Lyons Township in Cook County have been designated as nonattainment for the particulate matter (PM₁₀) standard. In addition, Oglesby and several adjacent townships in LaSalle County, and Granite City and Nameoki Township in Madison County have been designated as maintenance areas for the PM₁₀ standard. The sources of particulate matter that promoted the nonattainment and maintenance classifications are unrelated to transportation. All other areas of Illinois currently are in attainment for the ozone and PM₁₀ standards. No portion of this project is located within a designated nonattainment area or maintenance area.

2.7 Noise

Traffic noise impact and abatement analyses were conducted in accordance with the procedures as set forth in the FHWA's *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, 23 Code of Federal Regulations (CFR) Part 772; reissued FHWA Policy and Guidance document dated June 1995; and the Department's *Procedures for Highway Project Noise Analyses*, April 3, 2000. The FHWA Noise Abatement Criteria (NAC) in 23 CFR Part 772, and the substantial noise level increase over existing noise level criteria (14 dBA) in the Department policy, were used to identify and evaluate any noise impact. The traffic noise level predictions and noise mitigation analyses were performed using FHWA's *Highway Traffic Noise Prediction Model* (Report No. FHWA-RD-77-108) and the *STAMINA 2.0/OPTIMA Noise Barrier Cost Reduction Procedure* (Report No. FHWA-DP-58-1).

Generally, noise sensitive receptors correspond to existing or future planned noise sensitive developments (or groups of noise sensitive receptors as defined in 23 CFR Part 772), which are likely to be affected by changes in traffic volumes and design along U.S. Route 20 and the proposed interchanges and intersections.

Noise sensitive receptors include schools, hospitals, churches, playgrounds and recreation areas, residential areas, Section 4(f) areas, etc. (i.e., Activity B land uses according to FHWA's NAC in 23 CFR, Part 772) in the project area. Noise sensitive receptors generally comprise clusters of these types of noise-sensitive land uses, and may sometimes include more than one of these uses.

A total of 23 locations for existing noise level monitoring were identified along existing and proposed U.S. Route 20. These monitoring locations were selected as representative locations along the Alternates.



In order to establish baseline data, existing daytime noise levels were measured at each of the 23 locations. Land use categories for the 23 measured receptor sites, all of which fall into FHWA's Activity Category B, are distributed as follows: seven residential sites, one school, two nursing homes, two hotel/motels, and 11 farm houses. These 23 measured locations were distributed along the existing and proposed Freeway and Expressway Alternates in a manner that allowed existing and future noise levels to be estimated for each Alternate. **Table 2-11 of the DEIS presents the monitored sound levels for these sites. Receptor 5, missing from Table 2-11 of the DEIS, is listed below.**

	Monitoring Receptor Location	Monitor Location	Adjacent To	Time Period	Measured Sound Levels, L_{eq} , dBA	Approach or Exceeds NAC 67 dBA
Area 3	5	Residence on US Route 20 in Stockton	WB US Route 20	AM	60	No
				Weekend	56	No

2.8 Natural Resources

The geologic setting of the project area includes Cambrian through Silurian bedrock on the flanks of a regional structural high (Wisconsin Arch) which is overlain with unconsolidated Quaternary deposits. The bedrock deposits are sedimentary rocks (sandstone, siltstone, shale, limestone, and dolomite); and surficial beds are unconsolidated. **The area of Jo Daviess and Carroll Counties occur within the driftless area (unglaciated) and Jo Daviess County also lies within an area of karst topography.**

Geology

Bedrock and Structural Geology

The top of the Precambrian basement in the project area is at an elevation between 305 and 457 meters (1000 and 1500 feet) below mean sea level. In northern Stephenson County, it is primarily a biotite granite and granitic gneiss. The Paleozoic bedrock stratigraphy of the project area consists of Silurian, Ordovician, and Cambrian age sedimentary units (**Table 2-13 and Figure 2-3 of the DEIS**). From oldest to youngest rocks, these units are: Mt. Simon Sandstone, Eau Claire Formation, Galesville Sandstone, Ironton Sandstone, Knox Group, Ancell Group (includes the St. Peter Sandstone), Ottawa Supergroup (includes the Platteville Group and Galena Group), Maquoketa Group, Hunton Supergroup.

The project area lies on the Wisconsin Arch, a regional structural high that extends southeast from central Wisconsin into Illinois. This arch borders the Illinois Basin, a structural depression covering six states, which lies to the south. There are no major fault systems in the project area.

Surface Geology and Topography

The bedrock sequence is directly overlain with Quaternary deposits related to Pleistocene glacial advances and retreats (glacial till, meltwater outwash, loess, ancient soil horizons) and post-glacial Holocene processes (alluvial and colluvial processes, modern soil formation, and human activities). There have been at least two Pleistocene glacial stages in Illinois: Illinoian and Wisconsinan (latest). The Wisconsinan glacial episode did not reach the project area. Illinoian glaciers, however, advanced from the east as far as Stockton. Thus, surficial units between Stockton and Freeport consist of tills deposited directly by Illinoian glaciers while tills



are absent in the area from Stockton to Galena. This is depicted on Figure 2-4 (Surface Geology) of the DEIS.

The entire project area lies within the Central Lowlands physiographic province of the United States. The proposed alignments traverse two physiographic divisions of the state of Illinois: the Driftless Section (Galena to Stockton) and the Rock River Hill Country Subsection of the Till Plains Section (Stockton to Freeport).

The seven most prevalent soil types (out of 57) underlying the Alternates in Jo Daviess and Stephenson Counties are mapped by the NRCS soil surveys as Downs silt loam, Dunbarton-Dubuque silty clay loam, Fayette silt loam, Lacrescent silt loam, Palsgrove silt loam, Rozetta silt loam, and Tama silt loam. These soils make up between 72 percent and 77 percent, depending on the alternate selected, of all the soils in the proposed right of way for U.S. Route 20. All soil discussions are taken from the above-mentioned soil surveys.

Many of the soils in the project area are classified as highly erodible soils. These are soils that have slopes of four percent or greater. These soils generally occur along waterways in the project area and where slopes of up to 50 percent are encountered. These soils are listed in Table 2-14 (Highly Erodible Soils) of the DEIS.

Mineral Resources

Mineral resources in the project area include limestone, dolomite, sand, gravel, zinc and lead. Five active quarries (near existing U.S. Route 20 west of Elizabeth, West Galena, East Galena on West Stagecoach Road, near Wentzel Mound 9 miles north of Elizabeth, and west of Stockton) produce crushed rock for use as aggregate in concrete, road-base stone for bituminous road surfaces, riprap, and agricultural lime. There are no known active zinc-lead mines in the project area, though abandoned mines are present. The locations of quarries and abandoned mines within the project area were depicted on Figure 2-7 of the DEIS.

Karst Terrain

The prominence of carbonate rocks (limestone and dolomite) at or near the land surface makes the project area susceptible to the development of karst solution features (**Figure 2-1: Carbonate and Non-Carbonate Bedrock in Relation to U. S. Route 20 Sections, Jo Daviess and Stephenson Counties, Illinois**). The driftless area is one of five regions in Illinois where karstic features are concentrated. **The Driftless Karst Area includes all of Jo Daviess County and the western half of Carroll County (Panno and Weibel 2003; Webb, Taylor, and Krejca 1994).** Known karst features in the project area include caves, springs, and sinkholes (**Figure 2-2: Karst Features in Relation to U. S. Route 20 Sections, Jo Daviess and Stephenson Counties**). As can be seen in Figure 2-2, the particularly well-developed karst features occur southwest of the project area. In the project area, karst features tend to be comparatively small. Sinkholes are generally round and measure a few tens of feet in diameter. Roadcuts along major highways expose solution-enlarged crevices in the rocks (**Panno and Weibel 2003**). Sinkholes are associated with the Silurian dolomite at the Longhollow Observation Tower on U. S. Route 20 west of Elizabeth.

Enlargement of existing fractures and the development of interconnected solution cavities by karstification make the carbonate bedrock of this area an important aquifer. However, because of the rapid recharge of karst aquifers, they are also very susceptible to contamination from surface sources. **Aquifer sensitivity is defined as the ease with which a contaminant of any kind applied on or near the land surface can migrate to an aquifer (Berg 2001); aquifers are**



classified as A (very high) through E (low) sensitivity. (Figure 2-3: Aquifer Sensitivity Classifications In Relation to U. S. Route 20 Sections, Jo Daviess County, Illinois). The depth, thickness, and geologic character of an aquifer are considered when classifying aquifer sensitivity, along with special factors such as karst, which is considered the environment most sensitive to contamination.

Land Subsidence and Landslides

Unique surface geological conditions that exist in the project area have led to the development of **land subsidence (occurs when large amounts of groundwater have been withdrawn from Karst features and fine-grained sediments. The rock compacts because the water is partly responsible for holding the ground up. When the water is withdrawn, the rocks fall in on itself.)** and landslide prone areas. In the driftless area of Jo Daviess County, bedrock is at or near the ground surface. The shale is less resistant to erosion than the overlying dolomite. Preferential erosion of shale units removes support for overlying units. Rock creep (the continual movement of boulders at barely perceptible rates) also occurs. The area surrounding U.S. Route 20 west of Elizabeth between the Apple River and the Longhollow Observation Tower has been mapped as an area of slumping and landsliding, predominantly as rock creep, where dolomite blocks are creeping downward on a shale slope. Geological conditions elsewhere in the project area, e.g., shallow bedrock overlain by loess and/or glacial till, and loess or glacial till overlying paleosols (ancient soil horizons), also create landslide prone conditions.

Groundwater Resources

Water-yielding aquifer units can be found in unconsolidated sand and gravel, sandstone, or dolomite and limestone. Sand and gravel aquifers are generally restricted to areas of moderately thick glacial deposits in the bedrock valleys associated with the Pecatonica River near Freeport and Yellow Creek near Stockton. Important bedrock aquifers are Silurian dolomites perched atop the Maquoketa confining unit (shale); limestone and dolomite units in the upper Maquoketa Group; the Galena-Platteville unit; and the St. Peter Sandstone.

The Illinois State Geological Survey (ISGS) identified over 170 private wells within 305 meters (1,000 feet) of the alternates. No public water wells were found within 305 meters (1,000 feet) of the alternates. However, there may be wells near the project alignment that are not included in any database. Most water in the area investigated by ISGS is obtained from limestone aquifers at depths ranging about 21 meters to 162 meters (70 to 530 feet) (ISGS, 2001). As of May 2001, there are no USEPA designated Sole Source Aquifers in or near the project area.

The following municipalities within the project area use groundwater wells to supply drinking water: Stockton, Freeport, Eleroy, Galena, Lena, Woodbine and Elizabeth. None of these municipalities uses surface water resources to supply drinking water.

Groundwater Quality

A Preliminary Environmental Site Assessment (PESA) was conducted by ISGS along the alternates. This area was characterized as a high risk for the occurrence of hazardous materials based on the presence of potentially hazardous compounds at fourteen locations. At present, all sites may be sources of contamination to groundwater. In addition, farmland with applied pesticides and fertilizers are also potential sources of contamination to groundwater.

Karst aquifers are particularly susceptible to contamination from surface sources **because of the fractured and honeycombed bedrock and the absence of a thick soil cover.**



According to the Illinois Water Quality Report (IEPA, 2002), water quality data obtained from the Community Water Supply Network wells in the project vicinity are classified as “full use support.” This designation indicates that no detections occurred in organic chemical monitoring data and inorganic constituents assessed were at or below background levels for the groundwater source being utilized.

2.9 Surface Water Resources and Water Quality

The project area crosses two major river basins of Illinois, the Upper Mississippi River Basin and the Rock River Basin. The streams in both of these basins drain to the Mississippi River. Land cover in these watersheds are dominated by agricultural (row crop, pasture, hayfield), forest and developed (urban and built-up) lands.

Surface Water Resources

Water resources in the project area consist of streams, lakes, ponds, and wetlands. A total of 28 streams and their tributaries were assessed within the project area. As determined from the U.S. Geological Survey topographic maps most of the streams in the project area have permanent flow. The physical, biological and chemical parameters of these streams are identified in Tables 2-16 and 2-18 of the Draft EIS.

The major streams in the project area are the Galena River, Smallpox Creek, Furnace Creek, Apple River, Yellow Creek and Pecatonica River. Four of these streams have been rated by the Illinois Environmental Protection Agency (IEPA)/Illinois Department of Natural Resources (IDNR) Biological Stream Characterization (BSC) Workgroup. The BSC is a multi-tiered stream quality classification based primarily on the attributes of the lotic fish communities. The classification ranges from A (unique aquatic resource) to E (restricted aquatic resource). Furnace Creek, Yellow Creek, and the Pecatonica River have a BSC rating of C (moderate aquatic resource). The Apple River has a BSC rating of B (highly valued aquatic resource). The Galena River and Smallpox Creek are not rated. The reach of the Apple River between Wolf Creek and Mill Creek is also listed as a 'Biologically Significant Stream' by the Illinois Natural History Survey (1992).

Two of the streams in the project area are listed as candidate streams because of their wild and scenic qualities. Approximately 83 kilometers (52 miles) of the Apple River and 133 kilometers (83 miles) of the Pecatonica River are listed on the Nationwide Rivers Inventory (NRI) compiled by the National Park Service. River segments on this list potentially qualify as national wild, scenic or recreational rivers. The NRI sections of the Apple River extend from its mouth to Hanover and from Hanover to the Wisconsin State line. These sections are listed due to the Outstandingly Remarkable Values (ORVs) of scenery, recreation and geology. The NRI describes it as a pleasant stretch of river, flowing through hill and farm country with a scenic natural setting with smallmouth bass and trout fishing. **The Apple River, from its topographic divide in Wisconsin to its mouth at the Mississippi River near Savannah is 55 miles in length. Approximately 17 river miles upstream of the project area lies Apple River Canyon State Park. Approximately 223,000 people visited this site in 2002 (IDNR 2003). The river downstream of the park is used for fishing (moderate use) and canoeing and floating (light use). Apple River Road, from Elizabeth northeastward, traverses the east side of the river and has moderate use during the fall for viewing fall colors.** The NRI sections of the Pecatonica River extend from its mouth northwest of Freeport to McConnel Road. These sections are listed on the NRI due to the ORVs of scenery and recreation. The river is described as a scenic stream flowing mainly through farm country with rolling hills. **The project does not cross the Pecatonica River.**



Figure 2-1: Carbonate and Non-Carbonate Bedrock in Relation to U. S. Route 20 Sections, Jo Daviess and Stephenson Counties, Illinois –

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Figure 2-2: Karst Features in Relation to U. S. Route 20 Sections, Jo Daviess and Stephenson Counties - T:\IDOT\1283\Reports\EIS\Condensed Final EIS\Figures\Figure 2-2.dgn



Figure 2-3: Aquifer Sensitivity Classifications In Relation to U. S. Route 20 Sections, Jo Daviess County, Illinois - T:\IDOT\1283\Reports\EIS\Condensed Final EIS\Figures\Figure 2-3.dgn



Surface Water Quality

The waterbodies of the project area are subject to the General Use water quality standards. The Designated Uses in the project area include, aquatic life, fish consumption and swimming uses. **Of the 28 streams and their tributaries in the project area, only six of these streams (Galena River, Apple River, Furnace Creek, Yellow Creek, Unnamed Tributary of Waddams Creek, and the Pecatonica River) have been assessed for water quality by Illinois EPA (Water Quality Report 2002). Four of these streams are listed as being in partial support of their designated uses, and therefore, are considered to be impaired streams.**

Waters that are impaired are identified on a list, referred to as the Section 303(d) list (IEPA 2003). Waters identified on this list are subject to the development of Total Maximum Daily Loads (TMDL). The TMDL is the sum of the allowable amount of a single pollutant that a water body can receive from all contributing sources and still meet water quality standards and designated uses. In most cases, IEPA employs contractors to develop TMDLs and they are developed in conjunction with local involvement, which incorporate regulatory, voluntary and incentive-based approaches with existing applicable laws and programs (IEPA 2003). The impaired streams in the project area are currently scheduled for TMDL implementation in 8 to 13 years.

Currently four streams (Galena River, Apple River, Yellow Creek, and the Pecatonica River) are listed as having impairments in the Illinois Water Quality Report 2002 (IEPA 2002). The Galena River is in partial support of its aquatic life and fish consumption designated uses. It is also in nonsupport of its swimming designated use. The potential causes of the impairment are from pH, PCB's, pathogens, habitat alteration (other than flow), and suspended solids. The potential sources of these impairments are from pasture land, urban runoff/storm sewers, channelization, and unknown sources. The Apple River is in partial support of its fish consumption designated use and in nonsupport of its swimming use. The potential cause of the impairment is pathogens from unknown sources. Yellow Creek is in partial support of its aquatic life designated use. The potential causes of the impairment are nitrates from non-irrigated crop production and pasture land. The Pecatonica River is in partial support of its fish consumption designated use. The potential cause of this impairment is PCB's from unknown sources.

2.10 Floodplains

In the development of a Federally funded/regulated project, Executive Order 11988 (Flood Plain Management) imposes special requirements when the project will entail a significant floodplain encroachment. These are in addition to the IDNR Office of Water Resources floodplain requirements. The proposed project crosses the floodplains of ten streams. These floodplains have been designated by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. These floodplains are depicted on these maps as zone A (areas of 100-year flood; base flood elevations and flood hazard factors not determined). The streams having base floodplains in the project area are described in Table 2-1. These areas are depicted in Appendix K of the DEIS. No regulatory floodways are located in the project area.\



2.11 Wetlands

The 1987 U.S. Army Corps of Engineers Wetland Delineation Manual was used to delineate the wetlands in the project area. Wetlands within the project area were identified during field surveys conducted in 1994 and 1999. All potential wetlands in the project area were examined and 238 routine onsite wetland determinations were performed in the project area. A total of 203 individual sites or complexes were identified as jurisdictional wetlands. Approximately 91.6 hectares (226.3 acres) of jurisdictional wetlands occur in the project area. The size range for wetlands in the project area is from 0.02 to 2.77 hectares (0.06 acre to 6.84 acres).

Seven wetland communities have been identified in the project corridor. These and the number of sites in parenthesis are as follows: Farmed wetland (2), wet meadow (70), sedge meadow (48), marsh (5), wet shrubland (5), pond (61) and forested wetland (12). **The Floristic Quality Index (FQI) of the wetlands in the project area ranged between 0.4 and 35.1. An FQI score below 10 suggests a site of low natural quality, while a score below 5 may denote a highly disturbed site. An FQI value above 20 suggests that a site has evidence of native character and may be considered an environmental asset. Of the 203 wetlands in the project area, 35 have FQI's below 5, 66 have FQI's between 5 and 10, 55 between 10 and 15, 24 between 15 and 20, and 20 have FQI's over 20. Individual wetland descriptions including species composition, soil type, plant community type, hydrological indicators and FQI are depicted in Table 2-21 of the Draft EIS.**

2.12 Special Waste

A Preliminary Environmental Site Assessment (PESA) was conducted by the Illinois State Geological Survey (ISGS) in 2001 (updated September 2004) along the project corridor for each of the Alternates. This area was characterized as a high risk for the occurrence of regulated substances based on the presence of volatile organic compounds (VOCs) substantially above background levels in the headspace of soil samples taken from boreholes at the Amoco Pipeline on U.S. Route 20 and Wards Grove Township Garage and Maintenance Facility.

The PESA identified ten properties of environmental concern. Three of these properties are of concern because there is a registered underground storage tank present.

Evidence from aerial photographs, historical topographic maps and site visits indicates that some buildings along the project right of way were constructed before 1979 and may therefore have asbestos-containing materials as components in floor tile, wall and pipe insulation, roofing material, patching or paint compounds, ceiling materials and stove/furnace insulation. Asbestos discovered in any buildings to be demolished will require special removal prior to demolition.

The USEPA listing of potential, suspected, and known hazardous waste or hazardous substance sites in Illinois (i.e., the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS)) was reviewed to ascertain whether the proposed project will involve any listed site(s). As a result of this review, it has been determined that the proposed undertaking will not require any right-of-way or any easement from a site included in the CERCLIS listing as of August 20, 2004.

2.13 Biological Resources

The project area lies within portions of the Wisconsin Driftless Division and the Freeport Section of the Rock River Hill Country Natural Divisions of Illinois. Within the project area, the Driftless



Division has also been designated by IDNR as a Resource Rich Area (RRA). The Driftless Resource Rich Area covers approximately 777 square kilometers (300 square miles) in Northwestern Illinois on and around the Mississippi River in Jo Daviess, Carroll, and Whiteside Counties. The project corridor traverses a portion of this area between Stockton and Tapley Woods Land and Water Reserve. The Resource Rich Areas is an Illinois DNR program that identifies large areas containing concentrated natural resources (forests, wetlands, natural areas/nature preserves and biologically important streams) in order that cooperative public-private partnerships can be formed that merge natural resource stewardship with compatible economic and recreational development.

The Wisconsin Driftless Division was never glaciated during the Pleistocene era and consists of steep rolling hills with erosional features such as stream valleys. Limestone and dolomite occur in the road cuts and are scattered throughout the upland forests. Soils in this division consist of wind-blown loess, thicker on the east side of hills, and thinnest at the top of ridges. In areas of thin soils, bedrock dolomite hill prairies can be found. Most areas within the division have been altered for agricultural purposes to non-native grassland, hay, or row crops.

The Freeport Section includes most of the Rock River Hill Country Division. It is characterized by rolling hills and the presence of dolomite and limestone bedrock. Limestone caves are present. The Rock River Hill Country subsection is an area of steep, dissected topography, which also contains broad outwash plains. Soils are often thin, developed from a recent silt-loam cap of loess over old Altonian- and Illinoian-age glacial drift. Agricultural land and grassland are the predominant cover types.

Biological surveys in the project area were conducted over a period of several years in order to assess wetlands, riverine and upland habitat communities, wildlife resources and the occurrence of potential habitat for threatened and endangered species.

Cover Types/Habitat

The project area covers 272 square kilometers or 27,224 hectares (67,270 acres). Nineteen cover types were mapped within the project area. Three cover types (agricultural land, hayland, and pasture) account for 77.1 percent of the lands within the project area. The most common type of natural community in the project area is upland forest, which comprises 15.2 percent of the total area. **Developed land (residential, commercial, industrial) accounts for 6.1 percent of the lands within the project area. The remaining fourteen cover types make up less than three percent of the project area. A summary of cover type acreage's in the project area are given in Table 2-22 of the DEIS.**

Upland forests cover approximately 4,130 hectares (10, 200 acres) or 15.2 percent of the project area. The majority of the forests lie between Galena and Elizabeth (Jo Daviess County). These forested areas occur mainly on the ridges and parcels range in size from 8.1 hectares (20 acres) to 404.7 hectares (1000 acres) in size. Most of the sites have been or are currently being disturbed by grazing, logging or cutting for fuel and housing developments. Because of these past and present disturbances, specific forest sites differ in their species composition, density, size and age class. Generally, these forests are dominated by red and white oaks and shagbark hickories on the drier sites and sugar



**TABLE 2-1
DESIGNATED 100-YEAR FLOODPLAINS
WITHIN THE PROJECT AREA**

Alternate Section	Stream	Sheet No.	Approximate Average Width of 100-Year Floodplain		Cover Type(s)*
			Meters	Feet	
A-B	Galena River	5	293	960	2, 4, 22
A-B	Small Pox Creek	9, 10	168	550	13
B-D	Apple River	23, 24	472	1,550	4, 22
B-F	Furnace Creek	28, 29	180	590	2, 3
B-F	Furnace Creek	30	375	1,230	2, 3, 5
B-F	Apple River	32	244	800	4, 22
C-D	Apple River	38	530	1,740	2, 3, 4, 22
C-I	Apple River	39	143	470	4, 22
C-I	Wolf Creek	40	884	2,900	2, 4
C-I	Wolf Creek	41	363	1,190	2, 4
C-I	Yellow Creek Tributary A	53	79	260	4, 8
C-I	Yellow Creek	54, 55	232	760	2, 4, 5
C-I	Yellow Creek Tributary B	55	43	140	2, 4
C-I	Yellow Creek Tributary B	55, 56	177	580	2, 4
D-E	Wolf Creek	61	344	1,130	2, 4
H-J	Yellow Creek Tributary A	93	155	510	4, 13
H-J	Yellow Creek	94	427	1,400	2, 4
H-J	Yellow Creek Tributary D	94	34	110	4
H-J	Yellow Creek Tributary D	94	55	180	4
H-J	Yellow Creek Tributary D	94	49	160	4
I-K	Unnamed Tributary to Pecatonica River	108	64	210	4, 5
J-K	Unnamed Tributary to Pecatonica River	114	244	800	2, 4, 5

*** Code**

2	Pasture
3	Hayfield
4	Agricultural Land
5	Developed Land
8	Non-native Grassland
13	Floodplain Forest
22	River

Note: Sheet Nos. refer to sheets contained in Exhibits.

Source: The Louis Berger Group, Inc. 2002.



maple on the wetter sites. Other dominants include bur oak, black locust, white ash, black walnut, bitternut hickory and wild black cherry. The distribution of upland forest was depicted in Appendix O of the DEIS. Species composition, density, basal area, age class, and disturbance factors associated with forested areas are given in Table 2-24 of the DEIS. The Upland Forest cover type contains habitat for many species of amphibians, reptiles, birds, and mammals.

Prairie covers approximately 38 hectares (93 acres) or 0.001 percent of the project area. Because these areas are small in size and widely distributed and disturbed they do not provide much in the way of wildlife habitat. Their significance is related to their rarity and in some cases, to their plant species composition. Two types of prairie occur in the project area – dolomite hill prairie and mesic prairie. The dolomite hill prairie occurs scattered on the bluffs on the west side of the Galena River. Within the project area three dolomite hill prairies range in size between 1.24 hectares (3.1 acres) and 6.49 hectares (16 acres). The dominant species in these areas are little bluestem and eastern red cedar. These sites contain small numbers of uncommon plant species such as lead plant (*Amorpha canescens*), hoary puccoon (*Lithospermum canescens*), and prairie hummock sedge (*Carex richardsonii*). The state listed plant species, Inland New Jersey Tea, occurs at two of these sites. Mesic prairie remnants occur along railroad and roadway rights-of-way throughout the project area. None of these sites support rare species or intact, high quality prairie vegetation. These sites are dominated by little bluestem, big bluestem and a number of weedy Eurasian species.

Invasive Species

Approximately 27.5 percent of the state's flora is composed of alien (introduced) plant species. The Illinois Noxious Weed List contains several plant species (Canada and musk thistle) that occur in the project area. Invasive or nuisance species can establish themselves in rights-of-way during initial highway construction or afterwards due to maintenance practices. Because the proposed project may be located on new alignment, there is the possibility that it will introduce noxious and nuisance species to areas where they currently do not exist within the right of way. The Department will continue to implement the noxious and nuisance weed control programs along the new right of way.

Wildlife Resources

Amphibians and Reptiles

Fourteen species of amphibians and reptiles were observed during the field surveys of the project area. More than half of the land within the project area is agricultural and the majority of the remaining acreage is in pasture. However, there are still widely scattered areas of suitable habitat for amphibians and reptiles in the project area, particularly in the western portion where the rugged terrain has protected large tracts of land from disturbance. The most important habitat area for herpetofauna is associated with the Irish Hollow wetlands. The Irish Hollow wetland complex in the southwestern portion of the project area provides suitable habitat for a variety of reptiles and amphibians. This complex of seeps, flooded ditches, cattail marshes, ponds and larger waterbodies parallel Irish Hollow Creek for approximately 3 kilometers (1.9 miles). Seven species of amphibians and reptiles were recorded from this site.



Birds

A total of 52 species of birds were observed during the breeding season in the project area. Several of these species are Neotropical migrants, species of birds that breed in Illinois and winter in Latin America. Within the forested area of the project area 11 Neotropical migrants were identified during the breeding season (yellow-billed cuckoo, white-breasted nuthatch, wood thrush, red-eyed-vireo, common yellowthroat, chestnut-sided warbler, blackpoll warbler, ovenbird, scarlet tanager, American redstart and yellow-throated vireo). **In addition, several Neotropical migrants (cerulean warbler (*Dendroica cerulean*), Kentucky warbler, hooded warbler) have been known to breed in Tapley Woods Land and Water Reserve, adjacent to the project area.**

Mammals

Agricultural land interspersed with woodland, shrubland and grassland will provide habitat for a variety of common wildlife species. Most of the recorded species are habitat generalists (Hoffmeister 1989). Twenty-four mammal species were observed within the project area. Many were observed in both forested and agricultural areas and appeared to be widespread throughout the project area.

Threatened and Endangered Species

Federally-Listed Species

The U.S. Fish and Wildlife North Central Region "Redbook" lists the bald eagle (*Haliaeetus leucocephalus*), Indiana bat (*Myotis sodalis*), Iowa Pleistocene snail (*Discus macclintocki*), Karner blue butterfly (*Lycaeides melissa samuelis*), Higgens' eye pearly mussel (*Lampsilis higginsii*), and eastern prairie fringed orchid (*Plantanthera leucophaea*) as occurring in Jo Daviess and/or Stephenson Counties, Illinois. These species were discussed in the DEIS. **The U.S. Fish and Wildlife letter dated June 17, 2003, indicates that the DEIS adequately addressed species protected by the Endangered Species Act. The U.S. Fish and Wildlife County Distribution of Federally Listed Species in Illinois dated May 2003 lists the bald eagle (*Haliaeetus leucocephalus*), Indiana bat (*Myotis sodalis*), Iowa Pleistocene snail (*Discus macclintocki*), and Higgens' eye pearly mussel (*Lampsilis higginsii*) as occurring in Jo Daviess County. No species are listed in Stephenson County.**

State-Listed Species

The Illinois Endangered Species Protection Board lists a number of animal and plant species as occurring in Jo Daviess, Stephenson and adjacent counties. Field surveys within the project area between 1993 and 1999 have identified the northern harrier (*Circus cyaneus*), peregrine falcon (*Falco peregrinus*), brown creeper (*Certhia americana*), river otter (*Lutra canadensis*), timber rattlesnake (*Crotalus horridus*), drooping sedge (*Carex prasina*) and redroot (*Ceanothus herbaceous*) as occurring within the project area. **These species were discussed in the DEIS. The Illinois Endangered Species Protection Board adopted final changes to the Illinois list at its meeting on February 20, 2004. These revisions were incorporated into the amendments proposed to 17 Illinois Administrative Code 1010 which were published in the May 7, 2004, Illinois Register. The proposed amendments were adopted on August 31, 2004. The Board has delisted the brown creeper and the river otter. The peregrine falcon listing has been reassigned from endangered to threatened status. None of the species will be impacted. The Illinois Endangered Species Protection Board at their**



February 20, 2004, meeting added a number of species to the endangered and threatened species list. These revisions were incorporated into the amendments proposed to 17 Illinois Administrative Code 1010 which were published in the May 7, 2004, Illinois Register. The proposed amendments were adopted on September 1, 2004. Two of these species, Franklin's ground squirrel (*Spermophilus franklinii*) and cerulean warbler, have been reported from Jo Daviess County. The Franklin's ground squirrel is listed as a threatened species. The species is a true hibernator and is active (April to September) less than half the year. The squirrels are diurnal and spend less than ten percent of their life above ground (Hofmann 1999). Their most important habitat requirement is a tall, dense cover of grasses, forbs, shrubs, and even small trees; they avoid the short grass of closely grazed pastures or mowed areas. They often occur along railroad embankments and some roadsides. Mohr (1943) indicated that he had observed the ground squirrel at two locations in northwestern Jo Daviess County, but did not give specific locations. There has been no recent evidence that this species still occurs in Jo Daviess or Stephenson Counties.

The cerulean warbler is listed as a threatened species. The species is a Neotropical migrant and is rare and very sensitive to losses of forested areas. In Illinois, the warbler is restricted to tall, diverse floodplain forests or white oak dominated slopes. The species occurs with a greater frequency in larger (over 200 hectares (500 acres) in size) forest tracts and infrequent in wooded tracts less than 80 hectares (200 acres) in size. The species suffers from relatively high rates of nest parasitism by brown-headed cowbirds (Rosenberg et al. 2000). Nesting season dates for the warbler is identified in Table 4-10. The cerulean warbler has been identified as occurring in Tapley Woods.

Land and Water Reserves/Natural Areas

An Illinois Natural Area is an area of land in public or private ownership that has been identified by the Illinois DNR as having an important natural feature. Important features include high quality natural communities, endangered species sites, relict species sites, outstanding geologic and aquatic areas, or unique natural features, such as caves. One of these areas occurs within the project area. The Horseshoe Mound Geological Natural Area occurs 1.6 kilometers (1 mile) east of Galena (see Exhibits, Sheet 7). Approximately 4.5 hectares (16 acres) of this site is considered an outstanding example of a driftless area mound containing dolomite outcrops and a dolomite cliff community. **The IDNR letter dated July 18, 2003, indicated that the project as described in the DEIS will not have any adverse effect on Illinois Natural Area Inventory sites.**

The Register of Land and Water Reserves constitutes a land and water protection program wherein lands and waters supporting important natural heritage resources or archaeological resources are recognized and provided protection and management commensurate with the intent of the public in their long term protection and stewardship. Tapley Woods, owned and managed by the Illinois Department of Natural Resources, was registered as an Illinois Land and Water Reserve by the Illinois Nature Preserve Commission on August 3, 1999. **Tapley Woods is not a Section 4(f) resource.** This 105-hectare (259-acre) reserve consists of upland, slope, and ravine forest, with dolomite bedrock outcrops and associated springs. It is one of the best examples of the original upland and ravine forest of the Wisconsin Driftless Area of Illinois under state ownership. Tapley Woods supports breeding populations of area-sensitive forest wildlife species (Neotropical migrants), **a state-listed species (cerulean warbler)** and provides opportunities for hiking, nature study, wildlife watching, research and hunting. Tapley Woods is bisected by U.S. Route 20, with approximately 70 hectares (172 acres) of mesic upland forest with steep ravines, springs and seeps occurring on the northeast side of the highway. This tract



has a very diverse flora including one state-listed species (*Carex prasina*) and several rare plant species. Approximately 35 hectares (87 acres) of dry upland forest occurs on the southwest side of the highway and is slightly more disturbed and lacks springs and seep complexes. Although the ravines are similar in plant composition to the eastern side, the upland forest slopes are drier.

2.14 Visual/Aesthetics

The project area has a distinct visual character that has made U.S. Route 20 a popular and interesting scenic route. The project area consists of three distinct landscape zones that are established by major physiographic differences in topography and vegetation. These zones are Upland Ridges and Hollows, Rolling Hills and Valleys and Illinois Prairies. To establish a more detailed basis for evaluation, the existing visual environment was divided into smaller physiographic areas called rating units. Thirty-seven rating units were developed based on physiographic units 2.6 to 7.8 square kilometers (one to three square miles) in area. This served to accurately evaluate the scenic quality and sensitivity of the visual environment. Based on topography and viewpoint, viewsheds were used to define the limits of the visual environment.

Scenic Quality

Based on the fieldwork/inventory of scenic quality conducted in December of 1998, 37 landscape units were rated with a high, moderate or low rating based on the apparent quality of the visual resources relative to their physiographic region. Each of the 37 rating units was evaluated for viewer sensitivity. The results were presented at several public workshops by the Department for comment and review. Based on public input, the averaged scores were calculated to determine the final sensitivity level ratings.

The third element in the inventory and analysis was to define the viewpoints and viewsheds of the two major types of viewers in the project area. The two types of viewers that will be affected by the proposed project are Viewers of the road and Viewers from the road. To define the viewer's perspective, viewsheds were calculated using topography within the project area. The viewsheds depict the surface area visible from a given viewpoint or a series of viewpoints.

The final phase of the BLM methodology is the determination of Visual Resource Classes through a matrix process. Visual Resource Classifications are the means of synthesizing and drawing conclusions from the mapped information generated in the inventory. This process has yielded four Visual Resource Classes. Each Resource Class is given a list of recommendations for mitigation to be considered as a component of the final design. These recommendations are based on the value of the resource and the degree of acceptable alteration. A matrix of values was used to evaluate the mapped information listed above. Using Geographic Information System (GIS), a model was created that mathematically calculated conclusions by assigning values to each of the analysis maps.

The assigned values are based on certain recommendations as provided in the BLM guidelines and as a direct result of public input which was provided to the Department during the various public meetings and information centers which were held in the project area during various stages of project development. Input was also provided to the Department by the U.S. Route 20 Work Groups.

After each map was assigned values, these values were added together yielding four Visual Resources Classes. Resource classifications were calculated for the each of the Alternates providing a total of three Visual Resource Classification Maps. These maps would then be used in the development of recommended mitigation design measures.



Lighting

The proposed project will require the use of lighting. Lighting will be installed at each of the seven interchange locations (Illinois Route 84 north of Galena, Horseshoe Mound east of Galena, Devils Ladder, Illinois Route 84 northwest of Elizabeth, Woodbine, Illinois Route 78 at Stockton, Illinois Route 73 at Lena, and the Bolton Road at Elroy/Freeport). Partial interchange lighting will be installed at these interchanges. The lighting will consist of a few lamps located in the vicinity of some or all ramp terminals. The usual practice is to light those general areas where the exit and entrance ramps connect with the through traffic lanes of the freeway. The light source will be high pressure sodium (HPS) lamps. HPS lamps have excellent luminous efficiency, power usage, and long life. The HPS lamp produces a soft, pinkish-yellow light.

Apple River

The Apple River is listed as a candidate for wild and scenic status by the National Park Service. The river is approximately 88.5 kilometers (55 miles) in length. The Outstandingly Remarkable Values (ORV's) of the river include scenic, recreation, and geologic attributes. Apple River Canyon State Park occurs approximately 27.4 kilometers (17 miles) upstream of the project area. The Park receives an estimated 223,000 visitors per year (IDNR 2003).

The Scenic ORV's consist of landform, water, color, exemplary visual features and seasonal variations in vegetation. Overall it is a pretty river flowing through hill and farm country and down steep wooded valleys for much of its length to the Elizabeth area where the valleys widen out. The river is generally free flowing and meandering with moderate to heavily wooded corridors along it, (Thomas 2001). The river occurs within the driftless area of Illinois, an area where the bedrock surface has not been covered by glacial till. Water quality has been rated as good by the Illinois EPA, and is in compliance with many of its designated uses. Exemplary visual features include a pretty river flowing through hill and farm country and down steep wooded valleys for much of its length to the Elizabeth area. Seasonal variations in vegetation include fall color of the wooded valleys and the scattered stands of eastern red cedar on the crests of the bluffs during all times of the year, but most visible in the winter.

The Recreation ORV consists of fishing, boating, floating, sightseeing, wildlife observations, camping, hiking, and photography. Fishing is predominantly for small mouth bass, carp, bullhead and suckers. During springtime Apple River State Park is stocked with rainbow trout. Most of the river passes through private land, so permission to fish is required in most locations if you are outside the state park boundaries (Thomas 2001). Parts of the river can be floated and receives moderate floating pressure on it. Sightseeing, wildlife observations, camping, hiking, and photography undoubtedly are activities that occur.



3.0 PROJECT ALTERNATIVES

3.1 Project Alternatives Considered

No-Action Alternative

Under the No-Action Alternative, the proposed project would not be constructed or implemented. The existing local road, regional road and highway network would essentially remain in its current configuration with only normal maintenance and repair of the existing roadways and associated structures by the respective agencies and departments.

The construction of U.S. Route 20 is to be part of the National Highway System, as existing U.S. Route 20 currently is. However, implementation of the No-Action Alternative would perpetuate a functionally obsolete facility within that system. The No-Action Alternative will not reduce congestion, will not improve traffic safety, will not provide system continuity, will not improve community access, and will not meet the demands of economic development and recreational growth in the region.

Build Alternative

Under the Build Alternative, U.S. Route 20 would be constructed as a four-lane facility from Illinois Route 84 north of Galena to Business U.S. Route 20 near Bolton Road northwest of Freeport. A total of ten freeway alternates and two expressway alternates are being considered under the Build Alternative. Traffic on eastbound and westbound lanes would be separated by a minimum 15.2-meter (50-foot) wide median. The proposed facility would typically require right-of-way widths of 91.4 meters (300 feet), at a minimum, to a maximum of 194 meters (640 feet). The actual right-of-way width would depend on the constraints at any given location. Figures 3-1a and 3-1b give an overview of the sections that make up the twelve build alternates.

Sections

Due to the length and complexity of the project, the improvement is defined by sections. A section is a unique alignment either horizontal and/or vertical. All sections are defined by node points as designated on the Section Map by letters A through K. Each alternate is then defined by and consists of a series of adjoining sections. Figures 3-1c through 3-1f provide enlarged views of complicated areas of the sections.

Section AB

Section AB starts west of the intersection of existing U.S. Route 20 and Illinois Route 84 northwest of Galena, as shown on Figure 3-1a, and connects with the existing expressway cross section with two lanes in each direction. This section would continue in an easterly direction for approximately 3.8 kilometers (2.4 miles) before curving to a southeasterly direction. The crossing of the Galena River, the Illinois Central Railroad (the former Chicago, Central and Pacific Railroad, purchased in 1996), and Stagecoach Road would occur northeast of Galena. Section AB would pass to the east of Horseshoe Mound and cross existing U.S. Route 20 in a due south direction. This section continues in a general southeasterly direction ending just east of the intersection of Devil's Ladder Road with U.S. Route 20.



Figure 3-1a - Section Map West - T:\IDOT\1283\Reports\EIS\Volume\Exhibits\Sections Map West.dgn



Figure 3-1b - Section Map East - T:\IDOT\1283\Reports\EIS\Volume1\Exhibits\Sections Map East.dgn



Figure 3-1c - Sections C-D and D-E Detail -

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Figure 3-1d - Sections E-F (N) and E-F (S) Detail -
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Figure 3-1e - G-H (N) and G-H (S) Detail -

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Figure 3-1f - Sections I-J, L-K, and J-K Detail -

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There are three interchanges planned for this section - one at U.S. Route 20/Illinois Route 84 northwest of Galena, one at existing U.S. Route 20 east of Horseshoe Mound, and one southwest of the Galena Territory near Devil's Ladder Road. Section AB is common to all Alternates. This section has been designed as a freeway type facility utilized by all Alternates including the Expressway Alternates. The total length of Section AB is approximately 16.6 kilometers (10.4 miles).

Section BC

Section BC continues in a general southeasterly direction. This section passes to the west of Tapley Woods, roughly paralleling existing U.S. Route 20, as shown on Figure 3-1a. The section ends just southeast of the existing intersection of U.S. Route 20 and Illinois Route 84 (south), west of Elizabeth. One interchange is planned within this section, just before the end of the section near Illinois Route 84. This intersection would include the relocation of Illinois Route 84.

Section BC is common to several Freeway and Expressway Alternates. Section BC has been designed as both a freeway and expressway type facility depending upon the Alternate. The total length of this section is approximately 9.4 kilometers (5.9 miles).

Section BD

Section BD proceeds to curve in a southwesterly direction one and one-quarter miles into Irish Hollow before curving to the east, as shown on Figure 3-1a and Figure 3-1c. The alignment continues east for a short distance before resuming a southeasterly direction. Section BD curves to the east just before crossing Illinois Route 84 (south). One interchange is planned for this section at Illinois Route 84 (south). The section ends near Elizabeth-Hanover Road, southwest of Elizabeth just after crossing the Apple River. The length of this section is approximately 13.4 kilometers (8.4 miles).

Section BF

Section BF extends from Section AB, southwest of the Galena Territory, in a general easterly direction, and crosses existing U.S. Route 20 while skirting Tapley Woods to the north, as shown on Figure 3-1a. Once past Tapley Woods, this section swings to a more southeasterly direction, into Longhollow, for approximately 2.6 kilometers (1.6 miles). At Georgetown Road the alignment heads easterly, bypassing Elizabeth and Woodbine to the north. The section dips to the south to avoid a very steep section north of Becker Road while crossing the Apple River. Just northwest of Woodbine, Section BF pivots to a northeasterly direction before resuming an easterly direction. The section ends approximately 1.8 kilometers (1.1 miles) east of Scout Camp Road. Two interchanges are within this section - one at Scales Mound Road northwest of Elizabeth and the second northwest of Woodbine. This section also includes the 3.4-kilometer (2.1-mile) extension of Illinois Route 84 from existing U.S. Route 20 to Elizabeth Scales Mound Road at relocated Georgetown Road, just south of the proposed Scales Mound Road interchange. The total distance for Section BF, including the extension of Illinois Route 84, is approximately 23.2 kilometers (14.5 miles).

Section CD

Starting west of Elizabeth, this section curves to an easterly direction from a southeasterly direction, as shown on Figure 3-1a and Figure 3-1c. Section CD crosses the Apple River at



approximately the middle of the section. Section CD is a freeway type section and is 1.8 kilometers (1.1 miles) in length and does not contain any interchanges.

Section CI

Section CI is an expressway type section that is approximately 39.5 kilometers (24.7 miles) in length. This section starts west of Elizabeth in a general southeasterly direction, while crossing the Apple River, before turning in a general northeasterly direction bypassing Elizabeth to the south, as shown on Figure 3-1a and Figure 3-1c. Just east of Madison Road, this section swings to an almost due east direction, passes under existing U.S. Route 20, and follows the north slope of Terrapin Ridge, north of U.S. Route 20. This alignment shadows existing U.S. Route 20 to the north for approximately 2.1 kilometers (1.3 miles) before superimposing on the existing U.S. Route 20 right of way for 1.0 kilometer (0.6 mile). Section CI leaves the existing right of way southwest of Woodbine, as shown on Figure 1-2d, and heads in an east-northeast direction for nearly 3.9 kilometers (2.4 miles) before rejoining the existing right of way near Evans Road. This section continues to follow the existing right of way until Canyon Park Road, some 5.9 kilometers (3.7 miles). From Canyon Park Road to Tiger Whip Road, Section CI parallels existing U.S. Route 20 to the north for a distance of 9.0 kilometers (5.6 miles), as shown on Figure 3-1e. At Tiger Whip Road, Section CI would coincide with existing U.S. Route 20, for 10.8 kilometers (6.8 miles), to just west of Rees Road, where this section ends. There are five interchanges within this section - southwest of Elizabeth, Brown Road (south of Woodbine), Canyon Park Road (west of Stockton), Illinois Route 78 (northeast of Stockton), and Illinois Route 73 (south of Lena).

Section DE

Section DE is a freeway section that begins just near Elizabeth-Hanover Road southwest of Elizabeth and proceeds east to end east of Wolf Creek, as shown on Figure 3-1a and Figure 3-1c. There is one interchange in this section just east of Elizabeth-Hanover Road. The length of this section is approximately 3.5 kilometers (2.2 miles).

Section EF - North

Section EF - North is a freeway section that begins where Section DE ended, as shown on Figure 3-1a and Figure 3-1d. This section curves to the northeast and begins a tunnel alignment bypassing Elizabeth to the southeast. The tunnel passes under Terrapin Ridge, Derinda Road, and the intersection of U.S. Route 20 with Bethel Road. The tunnel portion ends northeast of the U.S. Route 20/Bethel Road intersection, north of existing U.S. Route 20, and continues in a northeasterly direction to the end of the section approximately one mile east of Scout Camp Road. The only interchange within this section is located northwest of Woodbine. The length of Section EF - North is approximately 9.3 kilometers (5.8 miles).

Section EF - South

Section EF-South is a freeway section that starts in the same locations as Section EF - North, as shown on Figure 3-1a and Figure 3-1d. Section EF - South continues east under Derinda Road before heading in a northeasterly direction, paralleling the proposed tunnel alignment of Section EF - North. Less than three-quarters of a mile separate the tunnel alignment and this alignment. Just before Fahrion Road, Section EF - South turns north for nearly one mile before resuming a northeasterly direction. This section ends approximately one mile east of Scout Camp Road. The only interchange within this section is located southwest of Woodbine on U.S.



Route 20 near Fahrion Road. The length of Section EF - South is approximately 10.1 kilometers (6.3 miles).

Section FG

Section FG is a freeway section that heads in a generally northeasterly direction from east of Scout Camp Road to west of Canyon Park Road just west of Rush Creek, as shown on Figure 3-1a. This section has a length of approximately 5.0 kilometers (3.1 miles).

Section GH - North

The total length of Section GH - North is 9.3 kilometers (5.8 miles). Section GH – North is a freeway section that starts just west of Rush Creek and heads in a general easterly direction, as shown on Figure 3-1b and Figure 3-1e. Section GH - North passes Stockton to the north (and stays north of Simmons Mound) before shifting direction to the southeast. This section curves to the east and ends less than three-quarters of a mile west of Tiger Whip Road. Two interchanges are found within this section - one at Canyon Park Road, northwest of Stockton, and one at Illinois Route 78, northeast of Stockton. Illinois Route 78 is shifted to the west in order to provide an adequate interchange with Section GH - North while avoiding Simmons Mound.

Section GH - South

Section GH - South is a freeway section that also starts just west of Rush Creek and heads in a general easterly direction, as shown on Figure 3-1b and Figure 3-1e. This section curves to the southeast just west of Park Road and continues southeasterly to approximately Curtiss Road (Ill. Rte. 78). From Curtiss Road the alignment heads in an easterly direction, passes Simmons Mound to the south, and ends less than three-quarters of a mile west of Tiger Whip Road. There is only one interchange along this section at Illinois Route 78. Relocated Illinois Route 78 starts at the existing "T" intersection of Illinois Route 78 and existing U.S Route 20 in Stockton. Relocated Illinois Route 78 proceeds in a northeasterly direction - through the proposed interchange - and ties back onto the existing Illinois Route 78 alignment north of Simmons Mound. The length of this section is 12.3 kilometers (7.7 miles), of which 3.2 kilometers (two miles) is for relocated Illinois Route 78.

Section HJ

Section HJ is a freeway section that begins west of Tiger Whip Road and travels easterly for 2.2 kilometers (1.4 miles) before curving to the northeast and immediately curving back to the east, as shown on Figure 3-1b. Section HJ continues in a general easterly direction for approximately 8.6 kilometers (5.4 miles) before curving to the southeast where the alignment passes under Galena Road and the Illinois Central Railroad. The section continues in this direction before ending between Wagner Road and Unity Road, approximately one mile away. The only interchange within this section is at Illinois Route 73 south of Lena. Section HJ has a distance of approximately 15.7 kilometers (9.7 miles).

Section IJ

Starting just west of Rees Road, Section IJ is an expressway section that gently curves from an east direction to a southeast direction, as shown on Figure 3-1b and Figure 3-1f. The length of this section is approximately 2.9 kilometers (1.8 miles). The Illinois Central Railroad passes under this section just southwest of Lena.



Section IK

Section IK is an expressway section that starts west of Rees Road and curves from an easterly direction to a southeasterly direction, as shown on Figure 3-1b and Figure 3-1f. This alignment bypasses Eleroy to the southwest and continues in a southeasterly direction for approximately 4.0 kilometers (2.5 miles) before curving to the east. Section IK is superimposed on existing U.S. Route 20 at several locations and proceeds in an easterly direction for approximately 1.3 kilometers (0.8 miles). Section IK passes under the Illinois Central Railroad and then angles to the northeast in order to meet existing U.S. Route 20 east of Ayp Road, where the section ends. An interchange at Bolton Road is the only interchange proposed in this section. The length of Section IK is approximately 10.7 kilometers (6.7 miles).

Section JK

Continuing in a southeasterly direction, Section JK is a freeway section that gently curves toward the east, as shown on Figure 3-1b and Figure 3-1f. After an interchange with Bolton Road, this alignment meets existing U.S. Route 20 almost 0.8 kilometers (0.5 miles) east of Ayp Road, where the section ends. The length of Section JK is approximately 7.1 kilometers (4.4 miles).

Freeway Alternate

Under the Freeway Alternate, U.S. Route 20 would be constructed as a four-lane freeway from Illinois Route 84 north of the city of Galena to Business U.S. Route 20 near Bolton Road northwest of the city of Freeport. A freeway is defined as a divided highway facility having two or more lanes for the exclusive use of traffic in each direction and full control of access and egress. Traffic on eastbound and westbound lanes would be separated by a minimum 16.4-meter (54-foot) wide median. At various locations, the median would vary in width, but would not exceed 25.6 meters (84 feet). Access would be provided at interchanges (always grade-separated), including all state-marked highways. All county roads, and most township roads, would be grade-separated. Frontage roadways would provide access to existing single-family homes, farmsteads, commercial operations, or industrial operations.

Freeway Alternates

There are 10 different Freeway Alternates depending on the combination of sections. All of these Alternates contain only freeway design elements and would pass east of Galena; south of Galena Territory and Lena; and north of Stockton. The description of each alternate follows.

- **Alternate 1 (Longhollow Freeway w/ North Simmons Mound Alternate)**

Alternate 1 would consist of sections AB, BF, FG, GH (N), HJ, and JK. This alternate would be approximately 76.4 kilometers (47.8 miles) in length and follow Longhollow within Section BF. Alternate 1 would pass north of Elizabeth, Woodbine, Simmons Mound, and Eleroy.

- **Alternate 2 (Longhollow Freeway w/ South Simmons Mound Alternate)**

Alternate 2 would consist of sections AB, BF, FG, GH (S), HJ, and JK. This alternate would be approximately 79.7 kilometers (49.7 miles) in length and follow Longhollow within Section BF. Alternate 2 would pass south of Simmons Mound; and north of Elizabeth, Woodbine, and Eleroy.



- **Alternate 3 (Irish Hollow Freeway w/ North Simmons Mound Alternate)**

Alternate 3 would consist of sections AB, BD, DE, EF (S), FG, GH (N), HJ, and JK. This alternate would be approximately 80.1 kilometers (50.1 miles) in length and generally follow Irish Hollow within Section BD. Alternate 3 would pass south of Elizabeth; and north of Woodbine, Simmons Mound, and Eleroy.

- **Alternate 4 (Irish Hollow Freeway w/ South Simmons Mound Alternate)**

Alternate 4 would consist of sections AB, BD, DE, EF (S), FG, GH (S), HJ, and JK. This alternate would be approximately 83.2 kilometers (52.0 miles) in length and generally follow Irish Hollow within Section BD. Alternate 4 would pass south of Elizabeth and Simmons Mound; and pass north of Woodbine and Eleroy.

- **Alternate 5 (Irish Hollow Tunnel Freeway w/ North Simmons Mound Alternate)**

Alternate 5 would consist of sections AB, BD, DE, EF (N), FG, GH (N), HJ, and JK. This alternate would be approximately 79.4 kilometers (49.6 miles) in length and generally follow Irish Hollow in Section BD. A 4,000-foot tunnel under Terrapin Ridge is proposed in Section EF (N). Alternate 5 would pass south of Elizabeth; and pass north of Woodbine, Simmons Mound, and Eleroy.

- **Alternate 6 (Irish Hollow Tunnel Freeway w/ South Simmons Mound Alternate)**

Alternate 6 would consist of sections AB, BD, DE, EF (N), FG, GH (S), HJ, and JK. This alternate would be approximately 82.4 kilometers (51.5 miles) in length and generally follow Irish Hollow in Section BD. A 4,000-foot tunnel under Terrapin Ridge is proposed in Section EF (N). Alternate 6 would pass south of Elizabeth and Simmons Mound; and pass north of Woodbine and Eleroy.

- **Alternate 7 (Upper Irish Hollow Freeway w/ North Simmons Mound Alternate)**

Alternate 7 would consist of sections AB, BC, CD, DE, EF (S), FG, GH (N), HJ, and JK. This alternate would be approximately 77.9 kilometers (48.7 miles) in length and traverse the northern slope of Irish Hollow in Section BC. Alternate 7 would pass north of Woodbine, Eleroy, and Simmons Mound; and south of Elizabeth.

- **Alternate 8 (Upper Irish Hollow Tunnel Freeway w/ North Simmons Mound Alternate)**

Alternate 8 would consist of sections AB, BC, CD, DE, EF (N), FG, GH (N), HJ, and JK. This alternate would be approximately 77.1 kilometers (48.2 miles) in length and traverse the northern slope of Irish Hollow in Section BC. A 1,219-meter (4,000-foot) tunnel under Terrapin Ridge is found in Section EF (N). Alternate 8 would pass north of Woodbine, Eleroy, and Simmons Mound; and south of Elizabeth.

- **Alternate 9 (Upper Irish Hollow Freeway w/ South Simmons Mound Alternate)**

Alternate 9 would consist of sections AB, BC, CD, DE, EF (S), FG, GH (S), HJ, and JK. This alternate would be approximately 81.0 kilometers (50.6 miles) in length and traverse the northern slope of Irish Hollow in Section BC. Alternate 9 would pass north of Woodbine and Eleroy; and south of Elizabeth and Simmons Mound.



- **Alternate 10 (Upper Irish Hollow Tunnel Freeway w/South Simmons Mound Alternate)**

Alternate 10 would consist of sections AB, BC, CD, DE, EF (N), FG, GH (S), HJ, and JK. This alternate would be approximately 80.2 kilometers (50.1 miles) in length and traverse the northern slope of Irish Hollow in Section BC. A 1,219-meter (4,000-foot) tunnel under Terrapin Ridge is found in Section EF (N). Alternate 10 would pass north of Woodbine and Eleroy; and pass south of Elizabeth and Simmons Mound.

Expressway Alternate

The alignments of the Expressway Alternates generally follow the existing U.S. Route 20 alignment. They incorporate the bypass of Galena (with a freeway cross section) and bypass Elizabeth, Woodbine, Stockton, and Eleroy. Under the Expressway Alternate, traffic on the eastbound and westbound lanes would be separated by a 15.2-meter (50-foot) wide median.

An expressway is defined as a principal arterial highway having two or more lanes for the exclusive use of traffic in each direction. It is constructed with partial access control with bypasses around communities, which are usually designed to full access control.

Crossroads usually remain open and are designed as intersections with median crossovers. However, a grade separation and/or interchange may be proposed depending upon traffic volumes and terrain.

The expressway configuration would travel east of Horseshoe Mound. Large cut and fill slopes would occur near the entrance to Galena Territory, at the end of the ridge near the View Tower, on Terrapin Ridge, on the ridge east of Woodbine, near Rush Creek, and on the ridge west of Stockton. Major bridge structures would be required at the Galena River, in the small valley at Stagecoach Trail, at Smallpox Creek, Apple River, and Rush Creek.

Expressway Alternates

Of the 12 different Alternates, only two have expressway components and are discussed here.

- **Alternate 11 (Expressway South Eleroy Alternate)**

Alternate 11 would consist of freeway section AB and expressway sections BC, CI, and IK. This alternate would be approximately 76.3 kilometers (47.7 miles). This alternate would pass south of Elizabeth, Woodbine, Simmons Mound, and Eleroy.

- **Alternate 12 (Expressway North Eleroy Alternate)**

Alternate 12 would consist of freeway section AB, expressway sections BC, CI, IJ, and freeway section JK. This alternate would be approximately 75.5 kilometers (47.2 miles). Alternate 12 would pass north of Eleroy; and south of Elizabeth, Woodbine, and Simmons Mound.

Table 3-2 provides an overview of the sections that make up the design alternatives, while Figures 3-2, 3-3, and 3-4 depict the typical cross-sections for the Freeway and Expressway Alternates, including the Freeway Tunnel Alignment (Alternates 8 and 10).



3.2 Project Alternatives Eliminated

Roadway Improvements to Existing Alignment

One alternate that was considered and eventually discarded was the construction of a new four-lane facility on the existing U.S. Route 20 alignment from Galena to Freeport. While it was determined that portions of the existing alignment could successfully be incorporated into a four-lane facility, other areas along the existing U.S. Route 20 proved to be unsuitable for a four-lane up-grade. This alternate was dismissed from further study for the following reasons:

- The rough terrain of Jo Daviess County from Galena to Stockton prohibited construction of a new highway along the existing alignment. **Specifically, the additional fill required to construct a new highway would have been excessive since existing U.S. Route 20 traverses ridge tops for much of this distance.**
- Installing a new roadway on the existing alignment would not meet the purpose and need for capacity and safety. **Over 95 percent of existing U.S. Route 20 does not meet one or more current design standards; either horizontal curves, vertical curves, sight distance, or substandard cross-sections.** Therefore, a new road supporting identical geometrics to the existing road would also fail to meet current design standards.
- **The passing through the Galena Historic District and the proximity of a large cluster of individual historic buildings to existing U.S. Route 20 precluded widening in Galena.**
- The sensitive environmental areas encountered along the existing alignment, just west of the entrance to the Galena Territory to a point west of Woodbine, discouraged the widening of the current route **even though IDOT owns 150 feet of right of way on each side of the existing U.S. Route 20 centerline through Tapley Woods.** The upgrade to a four-lane expressway along the existing route would have caused major disruption to Tapley Woods, an Illinois Land and Water Reserve, **though not a 4(f) resource. Specifically, impacts to upland forested areas and wildlife resources (Neotropical migrant birds and timber rattlesnakes) would have been greater than the other alternates.** In addition, many other scenic qualities along this stretch of existing U.S. Route 20 would have been destroyed.

Alignment through Scales Mound

The alignment through Scales Mound extends eastward from the intersection of Illinois Route 84 and U.S. Route 20 (Section AB) north of Galena, toward the Apple River, passing the community of Scales Mound. South of the Apple River the route continues southeasterly below the Apple River Canyon State Park to Illinois Route 78 near Stockton. Near Stockton, the corridor extends eastward (Section HJ), paralleling the existing U.S. Route 20 alignment to Lena where it extends in a southeasterly direction to connect to the Freeport bypass (see Figure 3-5). This alignment was part of the studies conducted by the Department in 1969, and an in-depth Corridor Analysis for the proposed alignment through Scales Mound was prepared by the Department for this route⁴. The corridor analysis report dismissed this alternate from further consideration for the following reasons:

- The Scales Mound Corridor would likely result in direct and proximity impacts to a substantial 4(f) resource, the Apple River Canyon State Park. The roadway would extend

⁴ *Corridor Analysis for Scales Mound Corridor*, Illinois Department of Transportation, November 1994.



across the Apple River near extensive cliff swallow populations and cliff swallow nesting sites. The Scales Mound Corridor would extend through those areas designated for the planned expansion of the Apple River Canyon Park.

- The alignment through Scales Mound favors thru traffic, and therefore would provide inadequate access to the City of Galena, the Galena Territory and the other communities presently served by U.S. Route 20. This alternate would not accommodate the anticipated economic growth for area communities within the Jo Daviess and Stephenson County region.
- An alignment through Scales Mound would still require that existing U.S. Route 20 be corrected and maintained at a higher level of service to accommodate existing and future travel demand and anticipated economic development activity and to improve travel safety along various sections of the existing U.S. Route 20 corridor. Development of the Scales Mound Corridor alone would not eliminate the need for capacity improvements to the existing U.S. Route 20.
- Because the proposed alignment through Scales Mound did not adequately address capacity deficiencies and increased traffic volumes, a reduction in traffic crashes could not be anticipated. It was determined that this route would fail to improve traffic safety within the existing U.S. Route 20 corridor to acceptable levels.
- The alignment through Scales Mound fails to improve east-west service to recreational and historic areas within the region, particularly along the existing U.S. Route 20 corridor.

Alignment through Snipe Hollow

The Freeway alignment through Snipe Hollow extends eastward from the intersection of Illinois Route 84 and U.S. Route 20 (Section AB) north of Galena and continues eastward north of the Galena Territory. East of the Galena Territory the corridor heads south and eventually merges into the alignment through Longhollow (Section BF) just east of Elizabeth Scales Mound Road (County Route 4) (see Figure 3-5a). The alignment through Snipe Hollow was dismissed from further consideration for the following reasons:

- The Snipe Hollow alignment would not meet community access needs. The majority of area traffic is destined for two destinations, the city of Galena and the Galena Territory. However, the Snipe Hollow alignment would not provide travelers sufficient access to these areas. This alignment would provide only one interchange for the city of Galena, which would have been geometrically inadequate to handle the peak load of vehicles known to exist at Galena during the busiest tourism days. The entrance and service road network would require complete reconstruction in order to provide access to the Snipe Hollow Corridor.
- The Snipe Hollow alignment would still leave four-lane warrants on existing U.S. Route 20 between the intersection of Illinois Route 84 and U.S. Route 20 north of Galena easterly to the intersection of Illinois Route 84 and U.S. Route 20 west of Elizabeth. Thus, it does not fulfill the objective of providing adequate highway capacity for traffic within the corridor.
- The Snipe Hollow alignment would fail to attract local traffic and through traffic destined for Galena, therefore traffic volumes would remain high along the existing alignment. As a result potential conflicts would not be reduced and safety concerns would not be addressed.



- The Snipe Hollow alignment would result in a 26 percent greater property severance than the alignment through Longhollow, and an 18 percent greater property severance than the alignment through Irish Hollow.

Mount Hope Road Bypass East of Galena

The Mount Hope Road bypass is a Galena bypass alternate that was considered for the area east of Galena. This alternate originates north of Galena (Section AB) and heads south, bypassing Galena on the east, following the Galena Territory on its western limits (see Figure 3-5a). The Mount Hope Road bypass was dismissed from further study for the following reasons:

- The bypass would result in a greater number of property severance impacts than the other bypass alternates.
- The bypass would result in a greater number of displacements than the other bypass alternates.
- The bypass would be located in close proximity to biological concerns at Smallpox Creek.
- The bypass would require the reconstruction and realignment of +/-1219 meters (+/-4000 feet) of Mount Hope Road.
- Extremely difficult terrain at the interchange location would make construction costly with deep rock cuts and lengthy ramps to meet design standards and sight distance requirements.
- A trumpet interchange at Mount Hope Road would require the realignment of +/-610 meters (+/-2000 feet) of existing U.S. Route 20 with associated impacts, would increase right-of-way requirements, and would have direct conflicts with a family cemetery.

AYP Road Interchange Alternate

Two interchanges, at AYP Road and Bolton Road (Section JK), were studied for the area west of Freeport (see Figure 3-5b). The interchange at AYP Road was dismissed from further consideration and the Bolton Road interchange was adopted for the following reasons:

- An intersection at AYP Road would result in a greater number of property impacts than an intersection at Bolton Road.
- The construction of an interchange at AYP Road would potentially impact several residences including a possible historic structure.
- Bolton Road has the potential to become a west-side beltline facility serving Freeport while AYP Road has minimal potential to be extended to the south.
- The needs of the overall public would be better met with an interchange at Bolton Road rather than at AYP Road.

Alignment through Northwest Irish Hollow

Although an alignment through the northern section of the Irish Hollow valley (Section BD) is currently being considered as a possible alternate, an older, different alignment through the



**TABLE 3-1
SECTION ALTERNATE CROSS-REFERENCE MATRICES**

SECTION		A-B	B-C	B-D	B-F	C-D	C-I	D-E	E-F (N)	E-F (S)	F-G	G-H (N)	G-H (S)	H-J	I-J	I-K	J-K
		GALENA BYPASS FREEWAY OR EXPRESSWAY ¹	FREEWAY OR EXPRESSWAY ¹	IRISH HOLLOW FREEWAY	LONGHOLLOW FREEWAY	EXPRESSWAY- IRISH HOLLOW FREEWAY CONNECTOR	EXPRESSWAY	IRISH HOLLOW FREEWAY	IRISH HOLLOW TUNNEL FREEWAY	IRISH HOLLOW FREEWAY	FREEWAY	NORTH SIMMONS MOUND BYPASS FREEWAY	SOUTH SIMMONS MOUND BYPASS FREEWAY	FREEWAY	EXPRESSWAY- FREEWAY CONNECTOR	EXPRESSWAY	FREEWAY OR EXPRESSWAY ¹
ALTERNATE	1	●			●						●	●		●			●
	2	●			●						●		●	●			●
	3	●		●				●		●	●	●		●			●
	4	●		●				●		●	●		●	●			●
	5	●		●				●	●	●	●	●		●			●
	6	●		●				●	●	●	●		●	●			●
	7	●	●			●		●		●	●	●		●			●
	8	●	●			●		●	●	●	●	●		●			●
	9	●	●			●		●		●	●		●	●			●
	10	●	●			●		●	●	●	●		●	●			●
	11	●	●					●								●	
	12	●	●					●							●		●

¹ Dependent on Alternate
* The Preferred Alternate is highlighted.

Figure 3-2 Proposed Typical Cross Section - Freeway Alignment -
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Figure 3-3 Proposed Typical Cross Section - Expressway Alignment -
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Figure 3-4 Proposed Typical Cross Section - Tunnel Alignment -
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Figure 3-5a Alternatives Considered and Rejected – West
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Figure 3-5b Alternatives Considered and Rejected – East
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northwest Irish Hollow (Section BD) was at one point studied as a possible project alternate (see Figure 3-5a). On the north end, this initial northwest Irish Hollow alternate connected the alignment to the interchange at Horseshoe Mound and continued south.

The following reasons were the basis for the dismissal of this alignment from further study:

- The original alignment through northwest Irish Hollow did not meet community access needs. The majority of area traffic is destined for two destinations, the city of Galena and the Galena Territory. However, the initial alignment through northwest Irish Hollow would not provide a direct connection for the Galena Territory, and therefore, would not provide travelers sufficient access to this area.
- This alternate failed to meet current design standards.
- This route would potentially impact a greater number of farm properties than the other alignments under consideration for this section of the project.
- It was determined that this alternate would fail to provide adequate access for farm vehicles.
- This alignment did not offer any meaningful engineering or construction advantages over the other alignments being considered that would encourage its inclusion for further analysis.

3.3 Preferred Alternate

The development of the project's Freeway and Expressway Alternates resulted from the close coordination and cooperation between the Department and various state and federal agencies, which were established early in the project's development. In addition, the public involvement program, which included a series of public information meetings, periodic newsletters, public information repositories, an 800 number information phone line, and a Citizens Advisory Council, served to further establish locally acceptable alignments for the Freeway and Expressway Alternates.

Local and regulatory environmental agencies, along with the Advisory Council and its Work Groups, which were established as part of the public involvement program (see Chapter 5.0), were all provided technical background information on the project as well as the environmental technical reports, which were prepared for this project separate from this DEIS. The agency and public comments received during the public involvement process and after the public review of the preliminary environmental studies, helped to further identify those design alternates to be further evaluated in the DEIS, please see Sections 3.1.4 and 3.1.5.

Based on its social, economic, environmental and engineering design studies, input from the general public and the recommendations of the U.S. Route 20 Citizen's Advisory Council, the Department has determined that Alternate 2, the Longhollow Freeway with the South Simmons Mound variation is the Preferred Alternate (Alternate 2).

The Department has found that while all of the Build Alternates provide for adequate system capacity, provide adequate community access, afford system continuity and address safety concerns, the Freeway Alternates provide a greater degree of safe travel through the project corridor than do the Expressway Alternates, due to the introduction of grade-separated interchanges. The Department's traffic crash data supports the consensus and recent research that grade-separated interchanges provide a greater level of safety than at-grade and signalized intersections, such as those that would be constructed with the Expressway Alternates.



Further, the Department has found that compared to the other Build Alternates, Alternate 2:

- as the least negative impact on environmental factors such as preservation of natural areas and threatened and endangered species,
- best preserves prime and important farmland while minimizing adverse travel for farm operations and incompatible traffic mixing for farm vehicles,
- best facilitates the travel and market access needs of the local communities in the project area,
- provides the best opportunity to facilitate contiguous growth and development for communities in the U.S. Route 20 corridor,
- avoids construction on or near ridge tops, thus making it consistent with Jo Daviess County land-use initiatives,
- provides for the maximum use of existing U.S. Route 20 as a scenic route for travelers,
- supports the Stephenson County Comprehensive land-use plan which recommends a four-lane freeway and
- is one of the least costly alternates to build.

The determination of Alternate 2 as the Preferred Alternate by the Department is supported by the findings of the U.S. Route 20 Advisory Council Report to the Department dated September 6, 2001. See Appendix H of the DEIS. In this document, the Advisory Council, through a unanimous decision, strongly recommended that the Department adopt the Longhollow Freeway Alternate with the South Simmons Mound variation as its Preferred Alternate and that the Department present it as the Preferred Alternate at the public hearing.

The Council further requested that the Department expedite the design and construction of this project, putting a priority on those sections with the highest traffic volumes. Finally, the Advisory Council recommended that the Department take a strong, progressive, proactive approach to mitigating the negative impacts of a new roadway, including the involvement of a citizen advisory group in the design and construction phases of the proposed project.



4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Social/Economic

Community Cohesion

The overall impact of the proposed project may be expected to have some positive and negative impacts. The construction of a four-lane limited- or controlled-access facility may make it more difficult for some neighbors to interact because they will have to walk or drive longer distances to see one another. Displacements may cause community members to move some distance from their present community. However, no communities will be divided to an extent that would prohibit access or make it extremely inconvenient for community members to continue present relationships. People generally identify with localities such as the city of Galena, the villages of Elizabeth, Stockton, and Lena, the township of Woodbine and the Galena Territory. The cores of these communities will remain intact; the Preferred Alternate will bypass these towns. While some members of project area communities may have to travel slightly longer distances to their destinations, the long-term impact of such inconveniences on community cohesion will be minor. People, families, farms, and businesses which are displaced may move to places more distant from their present communities, but closer to another community. Therefore, the social impacts of the relatively modest number of displacements associated with the Preferred Alternate will most likely in the long run prove to be minor.

Community cohesion in the project area may be strengthened in some ways by the proposed project. Travel times between communities will be reduced, facilitating more interaction among towns between Galena and Freeport. Improved accessibility among communities can lead to a beneficial interchange of ideas and views, and make it possible for people to extend networks of friends, and for more distant relatives to see one another more often.

Access Changes

The Preferred Alternate involves the least number of roadway closures (4) when compared to the other Alternates that were evaluated. These occur on local roads near Woodbine, Lena (2 roads), and at the eastern terminus of the project near Bolton Road. In each of these cases, the existence of nearby Freeway interchanges will offset the effects of the roadway closures. The locations of roadway closures that are expected with the Preferred Alternate are shown in Figures 4-1 and 4-2.

The Preferred Alternate will also require several roadway relocations. However, these will be very local in nature, and should not cause any considerable inconvenience.

Access changes for farms and residences are affected by roadway closures and relocations as well as closures or relocations of driveways. The access changes expected for farms and non-farm residences for the Preferred Alternate are presented in Table 4-1.

Public Services and Facilities

Figure 4-1 and Figure 4-2 also depict the public facilities within the project area in relationship to the Preferred Alternate.

School bus routes could be slightly affected by some of the local road closures as previously discussed. However, none of those road closures are expected to cause more than minor



Figure 4-1 Public Facilities and Roadway Closures, Alternate 2: Galena-Woodbine –
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Figure 4-2 Public Facilities and Roadway Closures, Alternate 2: Woodbine-Freeport -
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**TABLE 4-1
ACCESS CHANGES FOR FARMS AND RESIDENCES
U.S. ROUTE 20, GALENA TO FREEPORT
SUMMARY COMPARISON OF ALTERNATES**

Alternate Number	Route Description	ACCESS CHANGES FOR FARMS*		
		Moderate Access Inconvenience**	Severe Access Inconvenience**	Total Farms Affected
1	Longhollow Freeway	5	9	14
2	Longhollow Freeway w/Stockton Alt.	5	9	14
3, 7	Irish Hollow Freeway	6	13	19
4, 9	Irish Hollow Freeway w/Stockton Alt.	6	13	19
5, 8	Irish Hollow Freeway w/Tunnel	6	12	18
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	6	12	18
11	Expressway Eleroy Alt.	20	42	62
12	Expressway Lena Alt.	18	32	50

Alternate Number	Route Description	ACCESS CHANGES FOR NON-FARM RESIDENCES*		
		Moderate Access Inconvenience**	Severe Access Inconvenience**	Total Residences Affected
1	Longhollow Freeway	0	1	1
2	Longhollow Freeway w/Stockton Alt.	0	1	1
3, 7	Irish Hollow Freeway	0	2	2
4, 9	Irish Hollow Freeway w/Stockton Alt.	0	2	2
5, 8	Irish Hollow Freeway w/Tunnel	0	1	1
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	0	1	1
11	Expressway Eleroy Alt.	17	6	23
12	Expressway Lena Alt.	17	3	20

The Preferred Alternate is highlighted.

*Includes only farms and residences adjacent to existing or new U.S. Route 20.

**Definitions of Access Impact Types

Moderate Access Inconvenience

- Relocation of driveway entrance to public road system, or
- Increase of driving distance to U.S. Route 20 < ½ mile.

Severe Access Inconvenience

- New driveway in entirely different location;
- U-turn necessary for full access to U.S. Route 20;
- Residence area surrounded by roads; or,
- Increase of driving distance to U.S. Route 20 of > ½ mile.



inconvenience, which can be readily addressed by re-routing a few school bus routes, something which is normally done during each school year to adjust to changes in student residence locations. There will be some school district tax base reductions as a result of the acquisition of private properties. However, there will be no school property taken by the Preferred Alternate.

The anticipated road closures for the Preferred Alternate will be either located near proposed interchanges, or will be mitigated by the construction of local roads, resulting in no adverse effects on access to fire protection and emergency services. **It is not anticipated that any other Public Service or Facility will be affected.**

Residential and Farmstead Displacements

The Preferred Alternate includes the displacement of 34 residences and 3 businesses. Of the 34 residential displacements, 25 are farmsteads containing 103 buildings. Of the 103 buildings, 30 are major farm buildings and the remaining 73 are ancillary buildings.

In accordance with the Uniform Assistance and Real Property Acquisition Act of 1970 (as amended), a program of relocation assistance and payment is available through the Department. Policies implemented by the Department attempt to ensure that displaced persons receive fair and equitable treatment without discrimination and that the construction of any highway project designed for the benefit of the public will not result in undue hardship to any individual or group. Payments covering moving costs and supplemental housing and advisory assistance services are offered in addition to the state's payment for real property. If comparable quality housing is unavailable at the time of displacement, relocation payments based on last resort housing may be necessary.

Property acquisition will be staggered to correspond with each construction section of this project. For any given construction section, property acquisition will likely last at least one year but should not last longer than six years because of construction staging. Therefore, it should not be difficult for displaced residents to find comparable housing within the general area of their present residences.

Economic

Three (3) business displacements would be required for the Preferred Alternate.

The displaced businesses are all small retail establishments, none employing more than five people. Examples are an antiques mall and a flower shop-convenience store. None of the businesses that would be displaced are "one of a kind" whose loss would result in the absence of a particular service or type of goods in a community. No major industrial facilities will be displaced.

With regard to displaced businesses, there is ample land available in close proximity to any business that could be potentially displaced that is suitably zoned with adequate infrastructure.

In accordance with the Uniform Assistance and Real Property Acquisition Act of 1970 (as amended), a program of relocation assistance and payment will be available through the Department. Policies implemented by the Department attempt to ensure that displaced businesses receive fair and equitable treatment without discrimination and that the construction of any highway project designed for the benefit of the public will not result in undue hardship to



any individual or group. Payments covering moving costs and advisory assistance services are offered in addition to the state's payment for real property.

**TABLE 4-2
PROPERTY DISPLACEMENTS
U.S. ROUTE 20, GALENA TO FREEPORT
SUMMARY COMPARISON OF ALTERNATES**

Alternate Number	Route Description	RESIDENCES DISPLACED		
		Residences	Farmstead Residences	Total Residences
1	Longhollow Freeway	9	25	34
2	Longhollow Freeway w/Stockton Alt.	9	25	34
3, 7	Irish Hollow Freeway	11	23	34
4, 9	Irish Hollow Freeway w/Stockton Alt.	11	23	34
5, 8	Irish Hollow Freeway w/Tunnel	10	21	31
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	10	21	31
11	Expressway Eleroy Alt.	30	34	64
12	Expressway Lena Alt.	28	25	53

Alternate Number	Route Description	FARM BUILDINGS DISPLACED		
		Major Farm Buildings*	Ancillary Structures**	Total Farmstead Buildings
1	Longhollow Freeway	27	76	103
2	Longhollow Freeway w/Stockton Alt.	30	73	103
3, 7	Irish Hollow Freeway	9	37	46
4, 9	Irish Hollow Freeway w/Stockton Alt.	28	67	95
5, 8	Irish Hollow Freeway w/Tunnel	24	69	93
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	27	66	93
11	Expressway Eleroy Alt.	44	103	147
12	Expressway Lena Alt.	33	100	143

Alternate Number	Route Description	COMMERCIAL BUILDINGS DISPLACED
		Number of Buildings
1	Longhollow Freeway	3
2	Longhollow Freeway w/Stockton Alt.	3
3, 7	Irish Hollow Freeway	3
4, 9	Irish Hollow Freeway w/Stockton Alt.	3
5, 8	Irish Hollow Freeway w/Tunnel	3
6, 10	Irish Hollow Freeway w/Tunnel w/Stockton Alt.	3
11	Expressway Eleroy Alt.	6
12	Expressway Lena Alt.	5

The Preferred Alternate is highlighted.

* Major Farm Buildings include large barns, grain bins, and silos.

** Ancillary Structures include sheds and other outbuildings.



Employment, Output and Income Impact

The proposed project would stimulate the regional economy during the construction phase. Economic impacts would result from material purchases in the region, construction payrolls, and related indirect and induced spending, or "multiplier effects." In assessing the economic impacts of the project, it is important to recognize that economic benefits associated with the construction phase would occur for a relatively limited time during the actual construction.

Table 4-3 provides a summary of the estimated economic impact in terms of sales output, employment, and income generated by the Preferred Alternate and the Alternates that were evaluated in the DEIS, please see Section 4.1.6. Table 4-3 suggests that the total construction budget for the Preferred Alternate is \$577.40 million. Positively related to the total construction budgets, the project construction may generate \$282.60 million total sales, 6,857 total employment, and \$122.80 million total income.

Tax Revenue

Project-related construction would remove assessed land and buildings from the local tax base and would have a short term adverse effect on local property tax receipts. A tax revenue loss analysis was prepared for each taxing district in the two-county area. The effect on property tax revenue was calculated by determining the approximate value of land being taken and market value of structures removed from the taxing units for each alternate. Jo Daviess County would have a revenue loss of \$41,444 and a tax loss of 1.4 percent. Stephenson County would have a revenue loss of \$20,862 and a tax loss of 0.004 percent. Table 4-4 presents the tax revenue loss for all alternates that were evaluated in the DEIS, Section 4.1.7.

Land Use and Development Trends

Land uses converted to highway use include any land which will be acquired in order to construct the project. The character of the land use impacts of the project can be conveyed by considering land cover, which means the type of geographic feature found on the land. Land cover includes, for example, forests, cropland, wetlands of various types, water, or developed land. The distinction between land use and land cover is minor. Land use usually considers the use of parcels of land, while land cover occurs irrespective of ownership.

Table 4-5 presents the types of land cover which will be converted by the Preferred Alternate and the Alternates that were evaluated in the DEIS, please see Section 4.1.8.

The vast majority of land to be acquired would be agricultural, namely pasture, cropland, or "other" agricultural, which consists mostly of land used for fencing. The Preferred Alternate would use nearly 83 percent of this land for the proposed project. Nearly 10 percent of the land to be acquired for the project would be forested. On the other hand, developed land would account for a very minor portion of total land to be acquired for the project.

Land use plans have been recently updated in both Jo Daviess and Stephenson Counties. The updated Future Land Use Plan for Stephenson County identifies the proposed U.S. Route 20 Alternates on the future land use maps⁵. The Jo Daviess County Comprehensive Plan notes that the proposed project is being planned, and that the project is "of major interest"⁶. A Draft

⁵ Stephenson County, Illinois, Future Land Use Plan, July, 2000.

⁶ Jo Daviess County Comprehensive Plan Baseline Data, Draft, April, 1998, p. XI-1.



**TABLE 4-3
SUMMARY OF CONSTRUCTION SALES,
EMPLOYMENT AND INCOME GENERATION
ASSOCIATED WITH THE
FREEWAY AND EXPRESSWAY ALTERNATES**

Alternates	Total Construction Budget (Dollars in Millions)	Total Sales Impact (Dollars in Millions)	Total Employment Impact	Total Income Impact (Dollars in Millions)
1: Longhollow Freeway w/North Simmons Mound	\$579.8	\$283.8	6,886	\$123.3
2: Longhollow Freeway w/South Simmons Mound*	\$577.4	\$282.6	6,857	\$122.8
3: Irish Hollow Freeway w/North Simmons Mound	\$620.6	\$303.7	7,371	\$132.0
4: Irish Hollow Freeway w/South Simmons Mound	\$618.2	\$302.5	7,342	\$131.5
5: Irish Hollow Tunnel Freeway w/North Simmons Mound	\$632.7	\$309.6	7,514	\$134.5
6: Irish Hollow Tunnel Freeway w/South Simmons Mound	\$630.3	\$308.4	7,485	\$134.0
7: Upper Irish Hollow Freeway w/North Simmons Mound	\$611.0	\$299.0	7,256	\$129.9
8: Upper Irish Hollow Tunnel Freeway w/North Simmons Mound	\$623.0	\$304.9	7,399	\$132.5
9: Upper Irish Hollow Freeway w/South Simmons Mound	\$608.6	\$297.8	7,227	\$129.4
10: Upper Irish Hollow Tunnel Freeway w/South Simmons Mound	\$620.6	\$303.7	7,370	\$132.0
11: Expressway South Eleroy	\$451.5	\$221.0	5,362	\$96.0
12: Expressway North Eleroy	\$475.1	\$232.5	5,643	\$101.0

Sources: The Louis Berger Group, Inc., 2000.

Multipliers used was from *Benchmark Input-Output Accounts of the United States, 1992*, published September of 1998 by the US Department of Commerce, Bureau of Economic Analysis

* The Preferred Alternate is highlighted.



Statement of Goals and Objectives in the Jo Daviess Plan stresses the need for job creation and economic development, but does not specifically identify the proposed project. The emphasis in the goals statements was on scenic beauty protection, agricultural preservation, and preservation of rural character and quality of life.⁷

**TABLE 4-4
TAX REVENUE LOSS IN 1997 DOLLARS BY ALTERNATE**

Alternates	Sub-Total, Jo Daviess County	Sub-Total, Stephenson County	Total, Two- County Area	% Tax Loss	
				Jo Daviess County	Stephenson County
1: Longhollow Freeway w/North Simmons Mound	\$39,652	\$17,655	\$57,308	1.4	0.004
2: Longhollow Freeway w/South Simmons Mound*	\$41,444	\$20,862	\$62,306	1.5	0.005
3, 7: Irish Hollow/Upper Irish Hollow Freeway w/North Simmons Mound	\$50,723	\$18,898	\$69,621	1.8	0.004
4, 9: Irish Hollow/Upper Irish Hollow Freeway w/South Simmons Mound	\$47,432	\$18,904	\$66,336	1.7	0.004
5, 8: Irish Hollow/Upper Irish Hollow Tunnel Freeway w/North Simmons Mound	\$48,289	\$19,175	\$67,464	1.7	0.004
6, 10: Irish Hollow/Upper Irish Hollow Tunnel Freeway w/South Simmons Mound	\$45,429	\$19,179	\$64,608	1.6	0.004
11: Expressway South Eleroy	\$58,646	\$48,485	\$107,131	2.1	0.01
12: Expressway North Eleroy	\$58,537	\$45,766	\$104,303	2.1	0.01

Source: The Louis Berger Group, Inc., 2002.

Note: Tax loss information for each taxing district, by Alternate, is found in Appendix M of the DEIS.

* The Preferred Alternate is highlighted.

⁷ Jo Daviess County Comprehensive Plan, Draft Goals and Objectives, October 27, 1998.



TABLE 4-5
U.S. ROUTE 20 LAND COVER CONVERSION TO HIGHWAY USE

Acres of Land Cover by Alternate:

	<i>Pasture</i>	<i>Cropland</i>	<i>Other Agriculture</i>	<i>Forest</i>	<i>Open</i>	<i>Water</i>	<i>Developed Land</i>	<i>TOTAL*</i>
Alternate 1	698.8	1,681.5	4.8	271.7	11.3	2.8	62.2	2,901.7
Alternate 2**	689.1	1,670.1	4.8	274.0	11.2	2.8	61.8	2,869.1
Alternate 3	627.6	1,949.9	4.8	257.5	14.2	3.5	64.3	3,101.6
Alternate 4	617.9	1,938.5	4.8	256.8	14.1	3.5	63.9	3,066.0
Alternate 5	642.6	1,900.4	4.8	241.0	14.2	7.1	67.9	3,051.5
Alternate 6	632.9	1,889.0	4.8	240.3	14.1	7.1	67.5	3,015.9
Alternate 7	621.6	1,795.0	4.8	304.6	19.7	3.0	78.8	3,011.6
Alternate 8	636.6	1,745.5	4.8	288.1	19.7	6.6	82.4	2,961.5
Alternate 9	611.9	1,783.6	4.8	303.9	19.6	3.0	78.4	2,976.0
Alternate 10	626.9	1,734.1	4.8	287.4	19.6	6.6	82.0	2,925.9
Alternate 11	592.4	1,526.6	0.7	304.3	36.6	3.1	166.9	2,960.9
Alternate 12	611.4	1,532.8	0.7	304.0	34.1	3.1	149.6	2,933.1

Percent of Land Cover by Alternate:

	<i>Pasture</i>	<i>Cropland</i>	<i>Other Agriculture</i>	<i>Forest</i>	<i>Open</i>	<i>Water</i>	<i>Developed Land</i>	<i>TOTAL*</i>
Alternate 1	24.1%	57.9%	0.2%	9.4%	0.4%	0.1%	2.1%	100.0%
Alternate 2**	24.0%	58.3%	0.2%	9.5%	0.4%	0.1%	2.2%	100.0%
Alternate 3	20.2%	62.9%	0.2%	8.3%	0.5%	0.1%	2.1%	100.0%
Alternate 4	20.2%	63.2%	0.2%	8.4%	0.5%	0.1%	2.1%	100.0%
Alternate 5	21.1%	62.3%	0.2%	7.9%	0.5%	0.2%	2.2%	100.0%
Alternate 6	21.0%	62.6%	0.2%	8.0%	0.5%	0.2%	2.2%	100.0%
Alternate 7	20.6%	59.6%	0.2%	10.1%	0.7%	0.1%	2.6%	100.0%
Alternate 8	21.5%	58.9%	0.2%	9.7%	0.7%	0.2%	2.8%	100.0%
Alternate 9	20.6%	59.9%	0.2%	10.2%	0.7%	0.1%	2.6%	100.0%
Alternate 10	21.4%	59.3%	0.2%	9.8%	0.7%	0.2%	2.8%	100.0%
Alternate 11	20.0%	51.6%	0.0%	10.3%	1.2%	0.1%	5.6%	100.0%
Alternate 12	20.8%	52.3%	0.0%	10.4%	1.2%	0.1%	5.1%	100.0%

*Not including unmapped areas.

**The Preferred Alternate is highlighted.

Source: The Louis Berger Group, Inc., 2001.

However, the Overall Economic Development Plan for Jo Daviess County specifically mentions the need for the proposed project. This Plan, which was developed by a 30-member committee comprised of representatives from business and government, states as a county goal, "Support Highway 20 development".⁸

According to the updated Stephenson County Comprehensive Plan, "the construction of a new four lane divided U.S. Route 20 Freeway west of Freeport represents the highest priority transportation planning item for the region". The County's Future Land Use Plan has been designed to work with either the Freeway or Expressway Alternates, although the county has

⁸ 1997 Overall Economic Development Program, Jo Daviess Development, Inc.



identified its preference for the Freeway Alternate. According to the Plan, “the Freeway Alternate reinforces the Primary Future Land Use Plan Goals listed in Chapter 3” of the plan.

Environmental Justice

This project was evaluated in accordance with Executive Order 12898. Galena is 98 percent white, with a minority population of 0.8 percent. The median family income was \$44,063. Families below the Census Poverty Threshold are 4.3 percent. Elizabeth is 99 percent white, with a minority population of 0.3 percent. The median family income was \$41,354. Families below the Census Poverty Threshold are 4.5 percent. **Woodbine is 99.3 percent white, with a minority population of 0.5 percent. The median family income for Woodbine was \$31,403. Families below the Census Poverty Threshold are 6.3 percent.** Stockton is 99.7 percent white, with a minority population of 0.1 percent. The median family income was \$43,173. Families below the Census Poverty Threshold are 4.5 percent. Lena is 98.6 percent white, with a minority population of 0.3 percent. The median family income was \$49,375. Families below the Census Poverty Threshold are 2.2 percent. Freeport is 81.8 percent white, with a minority population of 15 percent. **The median family income was \$43,787. Families below the Census Poverty Threshold are 9.9 percent.**

The Census Poverty Threshold for a family of four in 2000 was \$17,029. **The 2004 Health and Human Services Poverty Guideline for a family of four is \$18,850.** Based on Census information, field observations, and public involvement activities, minority and low-income populations will not be disproportionately adversely affected by this project.

4.2 Agriculture

Analysis of the potential agricultural impacts involved the examination of federal, state, and local regulatory requirements and determination of monetary, land, drainage, and transportation effects. The analysis centered on acreage to be taken for the proposed right of way. Agricultural impacts for the Preferred Alternate are summarized in Table 4-6.

The Preferred Alternate will require 955 hectares (2,360 acres), or 0.3 percent of land in Jo Daviess and Stephenson Counties. Of those 955 hectares (2,360 acres), 343 hectares (842 acres), 0.1 percent, will be from prime farmland and an additional 442 hectares (1,087 acres), 0.1 percent, will be from important farmland. Soils suitable for farming, soil capability classes I and II) would lose 401 hectares (986 acres), 0.1 percent of the total land in both counties. Please note that prime and important farmland are separate criteria from soil capability class soil.

The Illinois Department of Agriculture (IDOA) uses the Land Evaluation and Site Assessment (LESA) System to assess general effects to agriculture caused by state and federal projects. LESA results are based on the total right of way acreage. The maximum score that can be received under the LESA evaluation is 300 points. The higher the point value assigned, the more viable the alternate is for agricultural uses and the greater the impact. The Preferred Alternate scored a total of 210 points, below the point (greater than 225) where alternates should receive the highest level of protection from conversion to non-agricultural uses. Selecting the alternate with the lowest total points will usually protect the best farmland located in the most agriculturally viable areas. The Preferred Alternate had the lowest point total and fell in the 176 to 225 group – alternates in the moderate range for protection. The AG-1006 forms may be found in Appendix A.



**TABLE 4-6
AGRICULTURAL IMPACTS FOR THE PREFERRED ALTERNATE**

Right of Way from Agricultural Resources	955 hectares (2,360 acres)
Prime and Important Farmland	785 hectares (1,929 acres)
Prime Farmland	343 hectares (842 acres)
Important Farmland	442 hectares (1,087 acres)
Soil Capability Classes (I & II)	401 hectares (986 acres)
Land Evaluation and Site Assessment (300 points max.)	210
Conservation Reserve Program (CRP)	
Area of CRP lands	58 hectares (143 acres)
Percentage of CPR lands	0.4
Centennial Farms	3
Severed Parcels	
Area	6,471 hectares (15,989 acres)
Number	98
Affected Parcels	67
Severance Management Zones	57 hectares (142 acres)
Landlocked Parcels	
Area	222 hectares (548 acres)
Number	34
Adverse Travel	177 kilometers (110 miles)
Displacements	
Farm Residences	25
Other Farm Structures	85
Agricultural Income Loss (based on 2000 data)	\$709,000

The number of farm buildings that require demolition or removal due to highway construction, including farm residences, barns, sheds, pens, bins, silos, windmills, or other structures associated with farm operations, was determined from field reconnaissance of the proposed alternates and review of recent aerial photographs. The Preferred Alternate will displace the fewest number of farm residences, 25, and the least amount of other farm structures at 85.

To estimate the loss of agricultural income from right-of-way takes, the total number of farm acres per county was divided into the total agricultural receipts (including livestock) from each county. The resulting number gives an approximate annual income loss for an acre of land in each county. The figures generated for Jo Daviess and Stephenson Counties were multiplied by the approximate agricultural acres taken by the right of way in each county to determine income loss resulting from construction of the Preferred Alternate. The Preferred Alternate has an agricultural income loss of \$709,000 per year (based on 2000 prices).

4.3 Cultural Resources

The cultural resources surveys conducted along the project corridor recorded numerous prehistoric and historic sites. Of over 300 historic period standing structures recorded, only five which are potentially eligible for listing on the National Register of Historic Places may be adversely impacted by the proposed project construction. However, none of these structures—three houses and two barns—will be directly impacted. **On September 24, 2001, the Illinois SHPO concurred with the findings that the proposed project will have no impact on any of the five structures as stated in IDOT's September 20, 2001, letter.**



All mounds and cemeteries will be avoided by the proposed project. To date, no archaeological sites historically associated with a federally-recognized Native American tribe have been found in the project area. A total archaeological survey will be conducted just prior to Phase II (design plan preparation) work. At that time, the results of this survey will be submitted to the Illinois SHPO and to the Native American tribes enumerated in Section 2.5 of the DEIS for review and comment. Should archaeological sites be found in the Preferred Alternate's alignment, which has the potential to meet the criteria for eligibility for the National Register, a program of subsurface evaluation will be implemented. The results of these investigations will then be evaluated for a Determination of Eligibility (DOE) for the National Register of Historic Places. A formal DOE will be submitted to the Illinois SHPO for concurrence. Should any of these archaeological sites be determined eligible, a data recovery plan will be formulated and submitted to the Illinois SHPO and the Federal Highway Administration under the Statewide Programmatic Agreement for Prehistoric Sites, ratified on September 19, 2002. A copy of the data recovery plan will then be filed with the Advisory Council on Historic Preservation.

All of the prehistoric archaeological sites found to date which are within the project corridor are the remains of former habitation sites. All of the historic period archaeological sites within the alternate alignments are the remains of former habitation sites or industrial sites (mines or pottery works). The potential significance of these archaeological sites rests upon the scientific data, which they may contain. None of these sites requires preservation in place, none are cemeteries, and none are subject to Section 4(f) of the Transportation Act of 1966.

4.4 Air Quality

Project Impacts

The results of the CO modeling for the village of Lena indicate that the CO concentrations are predicted to decrease from the No-Action Alternative. The proposed project is predicted to have a slightly beneficial effect on air quality, and is below the eight-hour NAAQS for CO of 9.0 ppm. Outside of Lena, the proposed project will result in CO concentrations well below the NAAQS for CO of 9.0 ppm.

Demolition and construction activities can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project area. (Equipment-related particulate emissions can be minimized if the equipment is well maintained.) The potential air quality impacts will be short-term, occurring only while demolition and construction work is in progress and local conditions are appropriate.

The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of materials. The potential is greatest during dry periods, periods of intense construction activity, and during high wind conditions.

The Department's Standard Specifications for Road and Bridge Construction include provisions on dust control. Under these provisions, dust and airborne dirt generated by construction activities will be controlled through dust control procedures or a specific dust control plan, when warranted. The contractor and the Department will meet to review the nature and extent of dust-generating activities and will cooperatively develop specific types of control techniques appropriate to the specific situation. Techniques that may warrant consideration include measures such as minimizing track-out of soil onto nearby publicly traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces,



particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, this project will not cause any significant, short-term particulate matter air quality impacts.

Further detailed information regarding project related impacts and conformity is provided in Section 4.4 of the DEIS and in Volume I of the Air Quality Technical Report which was prepared separate to the DEIS.

4.5 Noise

Impacts

Impacts were analyzed and evaluated against the Noise Abatement Criteria (NAC) described in Section 2.0 of the DEIS and in Volume I of the Noise Technical Report. The FHWA criterion for category B land use receptors dictates that a noise impact exists when noise levels approach (within one dBA) or exceed 67 dBA. In addition, the Department's policy considers an impact to occur when noise levels increase by more than 14 dBA over existing noise levels due to a project's traffic noise. Mitigation measures were considered and evaluated, per FHWA and Department policies, when an impact was determined to have occurred. As part of the mitigation analysis, noise barriers were analyzed for receptors along the alignment of the Preferred Alternate. The following table summarizes the impacts as a result of the Preferred Alternate.

**TABLE 4-7
NOISE IMPACT SUMMARY TABLE – PREFERRED ALTERNATE**

Section	No. of Receptors	Existing Year L _{eq} (dBA)		Year 2020 L _{eq} (dBA)		Receptor Meets or Within 1 dBA of NAC	Receptor Greater than 14 dBA above Existing
		min.	max.	min.	max.		
AB	22	49	64	57	68	3	2
BF	11	48	56	58	70	2	1
FG	0	NA	NA	NA	NA	NA	NA
GH(N)	7	49	60	57	68	1	0
HJ	20	44	57	58	69	7	7
JK	7	49	66	62	75	5	1
TOTAL	67	44	66	57	75	13	8

NA = Not applicable

Mitigation

The most common type of designed mitigation is the construction of physical barriers, typically in the form of noise walls (noise barriers) and/or earth berms between the roadway (noise source) and the receiver locations. According to the Department's *Procedures for Highway Project Noise Analyses*, a minimum of 8-dBA reduction in highway traffic noise levels is required to protect the receptor(s). Mitigation is designed to achieve these levels of noise reduction rather than a specified absolute noise level. Therefore, mitigation may be appropriate even if the mitigated noise level exceeds FHWA's NAC for a particular activity category.

The majority of the identified impacted noise receptors are scattered too far apart to permit noise barriers to be built at a reasonable cost. Therefore, noise barriers were not studied for areas, communities, and subdivisions with less than six sensitive receptors. No sensitive receptors along the Preferred Alternate were identified as being impacted. Therefore, noise barriers were not evaluated for noise mitigation.



Other types of noise barriers, i.e., earth berms or vegetation screenings, are limited in effectiveness unless large parcels of land immediately adjacent to the source are acquired and/or impacted for this use. Landscaping does provide a line-of-sight abatement that can reduce the psychological effects of traffic noise (i.e., if a receptor cannot see the source of noise, there is a perceived lessening of the noise generated). But, as stated earlier, the majority of the identified impacted noise receptors along the Preferred Alternate are scattered too far apart to permit noise barriers, of any kind, to be built at a reasonable cost. This addresses comment 1 in Section 5.4 in this FEIS.

Construction Noise

Construction noise differs from traffic noise in the length, type and duration of noise events. Construction noise is of a fixed duration and ceases at the completion of the construction phase. Construction noise, usually limited to daylight hours, differs from normal vehicular traffic noise, which continues throughout the day- and nighttime hours. Additionally, construction-related noise is responsible for a variety of impulsive, discontinuous noise sources, such as jack-hammers and/or vibratory rollers. Traffic noise, although varying in level, is more continuous as a noise source. A temporary increase in noise levels will occur during the time period that construction takes place. Noise levels due to construction, although temporary, can impact areas adjacent to the proposed project.

Construction noise will be controlled in accordance with Article 107.35 of the *Standard Specifications for Road and Bridge Construction* as adopted January 1, 2002. In addition, the following mitigation strategies will be employed to the greatest extent possible to limit the potential impact of noise during construction.

4.6 Natural Resources

4.6.1 Geology

The proposed project has the potential to impact geological resources. In addition, surface conditions (soils and geology) and bedrock geology along the proposed alignments place constraints on construction practices and project design.

Surface Geology and Topography

Highly erodible soils occupy approximately 9,238 hectares (22,826 acres) of the project area. Areas of highly erodible lands are mainly confined to steeply sloping upland areas. The location of the roadway will be placed to minimize soil cuts and long-term maintenance issues including sloughing. Erosion control features will be designed to minimize soil erosion during the Phase II design process in accordance with the *Standard Specifications for Road and Bridge Construction* (IDOT 2002).

Karst

In the Driftless Section, the proposed roadway will be susceptible to impacts from karst features present in underlying carbonate rocks. These impacts include instability from the increased loading on existing rock cavities or the removal of structurally sound overburden and rock cover over existing cavities (Fischer *et al.* 1993). Construction related changes in the water table can induce subsidence and undermine the highway (Mellett and Maccarillo 1993). In karst terrains, groundwater is very susceptible to contamination from stormwater runoff because of rapid recharge through open conduits. The infiltration of stormwater runoff can facilitate the



development of collapse features. If Karst features are encountered during the design of the Preferred Alternate, special design consideration will be applied to prevent groundwater contamination. Stormwater runoff drainage designs will minimize infiltration and convey runoff to discharge points outside the vulnerable area, as necessary.

Of the twelve alternates, the Preferred approaches the fewest known karst features (see Table 4-8). No known karst features will be impacted by the project. However, it is recognized that some karst features are not readily observable (such as solution-enlarged cavities). During construction, some of these features may be uncovered. At that time, the Department will analyze the situation and obtain a solution that will avoid these features becoming direct conduits for highway runoff to enter the groundwater.

Land Subsidence and Landslides

In the areas surrounding Galena and Elizabeth, the alternates traverse areas with abandoned mines. Areas close to underground mines may be susceptible to subsidence (Bauer *et al.* 1993). Of the nine mines that are within 152 meters (500 feet) of the proposed right of way (as described in Section 4.6.1.5 of the DEIS), none will be impacted by the Preferred Alternate.

Various surficial geological conditions, prone to slumping (**land subsidence**) and landsliding, exist equally throughout the project area. Stability will be considered in road design. Units of particular concern are Silurian dolomites, weathered Maquoketa shale, and soils with low cohesive strength. The geotechnical engineering reports prepared for the proposed project have identified potential impacts and constraints imposed by the geotechnical properties of the surface and subsurface material anticipated to be encountered during construction. **Measures to address potential problems associated with surficial geological features will be incorporated into the Phase II design process.** These measures for rock slopes are reinforcing the unstable cut slopes with retaining walls; cement grouting of fissured, cracked and creviced rocks; placing wire mesh on excavated and natural rock slopes to prevent the falling of rocks; and placing gabion baskets combined with wire mesh to protect slope faces. When subsurface embankment is saturated, embankment failure is possible. Water can be prevented from saturating pavement subgrades by installing drains to divert surface runoff or by removing water in subgrades with underdrains or drainage blankets.

Further detailed information on land subsidence and landslides is provided in Section 4.6.1.5 of the DEIS.

Groundwater Resources

The sensitivity of aquifers to contamination in the corridor is shown in Figure 2-3. Stephenson County has not been mapped and is not included in this analysis. The sensitivity of aquifers along each alternate has been summed by roadway mileage and is presented in Table 4-8. In general, high aquifer sensitivity in Jo Daviess County occurs due to highly permeable bedrock or sand and gravel aquifers near the lands surface. Low aquifer sensitivity is found in areas underlain by shale, or where bedrock is covered by glacial sediments in the eastern part of the county. Alignments 1 and 2 (preferred alternate) crossed the highest amount of land classified as having high aquifer sensitivity, and alignments 5 and 6 crossed the least amount of land classified as having high aquifer sensitivity (Weaver, Carstens, and Miner 2004).

Potential impacts to groundwater resources from the proposed project include encroachment into Wellhead Protection Areas and setback zones; loss of aquifer recharge area; and impacts



to groundwater quality by contaminants associated with project related construction period and post-construction activities.

An inventory of wells located near each alternate was conducted in 2001 (ISGS2001). Although 26 of the 171 wells identified by ISGS are within 61 meters (200 feet) of the centerline of the alternates, the 61-meter (200-foot) wellhead setback is only relevant for routes or sources of groundwater pollution. Since the project will not introduce any new routes (dry wells or borrow pits) or sources (bulk road oil or deicing salt storage facilities), there will be no violation of the wellhead setback requirements.

Aquifers in the project area recharge by the infiltration of precipitation. The probability of precipitation infiltrating the soil surface and percolating downward to the uppermost aquifer has been mapped by Keefer and Berg (1990) as the potential for aquifer recharge. Due to the presence of a relatively impermeable weathered zone, stream alluvial deposits would be the areas most vulnerable to impacts from the loss of recharge area. There exists the potential need for borrow pits as part of the construction of the project. All borrow pits will require a permit issued during Phase III of the project.

Portions of these areas will be crossed on structure. There will be no loss to aquifer recharge area where the new road is on structure. Where the roadway is not on structure, the runoff from the new paved roadway surface will not be lost to the groundwater system but will be contained within it by being directed to grassed medians and roadside drainage ditches or local streams. Drainage ditches and embankment slopes after construction will be vegetated and non-paved, and thus will continue to facilitate recharge.

The replacement of pervious ground surfaces with impervious roadway surfaces will result in the loss of aquifer recharge area. However, the impacts to the aquifer system of the project area will be small.

Groundwater Quality

During construction, project related sources of contamination (e.g., disturbed contaminated sediments and groundwater) might exist. Accidental spills and temporary staging areas for construction equipment and supplies are also potential contaminant sources. When the roadway is operational, potential post-construction sources of contaminants are highway stormwater runoff, snowmelt from roadside snowbanks, and accidental spills. Unconfined sand and gravel aquifers and shallow, highly fractured bedrock aquifers are most vulnerable to water quality impacts, particularly in karst areas.

Conditions most favorable for rapid downward movement to shallow aquifers are not present in the project area. Thus, adverse impacts to groundwater quality from this project are not anticipated. However, best management practices will be implemented during the construction and post-construction phases of this project to minimize any infiltration of surface contaminants to ensure the greatest level of protection to groundwater quality.

If future investigations reveal that construction activities along the Preferred Alternate will encounter contaminated soils and groundwater **and impact karst aquifers**, the applicable waste disposal, dewatering, and effluent discharge rules and regulations will be followed and the proper permits will be obtained. Accidental spills will be cleaned up according to the regulatory requirements and measures will be implemented to limit infiltration. All disturbed contaminated soil or groundwater that is contaminated above the regulatory limits will be managed and disposed of according to all state and federal laws and regulations.



**TABLE 4-8
SENSITIVITY OF AQUIFERS TO CONTAMINATION**

Alternates	Alignment Mileage reported by the Department	Carbonate Bedrock (mileage along alignment)	Non-Carbonate Bedrock (mileage along alignment)	High Aquifer Sensitivity (mileage along alignment)	Moderate Aquifer Sensitivity (mileage along alignment)	Low Aquifer Sensitivity (mileage along alignment)	# of Known Karst Features within 500 feet of center line	# of Known Karst Features within 1000 feet of center line
1	47.9	32.3	13.6	19.7	1.9	11.7	4	8
2	47.8	32.2	13.7	19.7	1.8	12.0	4	8
3	50.3	30.9	20.0	18.5	1.9	17.5	5	10
4	50.2	30.8	20.1	18.6	1.8	17.8	5	10
5	49.8	30.9	19.4	15.8	1.9	17.1	6	12
6	49.7	30.8	19.5	15.9	1.8	17.4	6	12
7	48.9	32.8	16.3	19.0	1.9	15.7	6	11
8	48.4	32.8	15.7	19.0	1.9	15.4	7	13
9	48.8	32.7	16.4	19.1	2.7	16.0	6	11
10	48.3	32.7	15.8	19.0	2.7	15.7	7	13
11	43.4	22.5	21.9	16.4	1.1	17.4	6	14
12	42.9	23.9	17.3	16.4	1.1	17.4	6	13
Current U.S. Route 20	not provided	26.9	20.2	14.6	1.7	18.4	1	6

Alternates and other data listed by segment in the appendices. The Preferred Alternate is highlighted.
Note: Total miles may not have equal totals due to different methods and data sources used.

4.6.2 Biological Resources

Cover Types

Of the twelve alternates considered, the Preferred Alternate (Alternate 2) will require the least amount of land (Table 4-9). These cover types represent disturbed areas that typically have a low diversity of native plant species. The major cover types important to wildlife that would be affected by the Preferred Alternate include upland forest and wetlands. There are patches of native grassland but these areas are too small to have much wildlife value.

Upland Forest

Upland forest impacts vary from hectares (240.3 acres) in Alternate 6 to hectares (304.6 acres) in Alternate 7 (Table 4-9). The Preferred Alternate will impact approximately 109.7 hectares (274.0 acres) of upland forest. Approximately ninety percent of the impact to upland forest occurs between Galena and Woodbine. The forested areas are generally dominated by oaks, hickories and maples, depending on slope and past history. These areas also vary in age, presence/absence of shrub/sapling layers, and type and intensity of disturbance.



One area contains a forested area that is approximately 158 hectares (390 acres) in size. The forest is characterized as a mesic oak-maple hardwood. The Preferred Alternate will impact approximately 19 hectares (47 acres) of this forested area. Alternates 3 through 6 and Alternates 7 through 12 will impact approximately 19.4 hectares (48 acres) and 23.6 hectares (58.3 acres) of this area, respectively.

The loss of 274 acres of upland forest will be mitigated. The mitigation will be in the form of a forest restoration. That is, specific canopy, shrub, and herbaceous layers will be established. The goal of the restoration is to duplicate, as much as possible, the existing native upland forest plant community in the area adjacent to the project. Six parcels of land that lie between the proposed project and the Tapley Woods Land and Water Reserve will be utilized for upland forest restoration. These six parcels are currently in upland forest or pastureland. The parcels contain 209.5 acres of land, of which 105 acres are not forested. The addition and successful forest restoration at these locations will add an additional 209.5 acres of forest under public ownership and will help mitigate for the loss of Neotropical migrant bird species. The forested areas in the project area range

**TABLE 4-9
SUMMARY OF COVER TYPES AFFECTED BY EACH ALTERNATE**

Cover Type	in Acres											
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8	Alt. 9	Alt. 10	Alt. 11	Alt. 12
Agricultural Land	1,504.8	1,493.4	1,765.2	1,753.8	1,758.2	1,746.8	1,563.5	1,556.5	1,552.1	1,545.1	1,367.7	1,357.1
Pasture	698.8	689.1	627.6	617.9	642.6	632.9	621.6	636.6	611.9	626.9	592.4	611.4
Upland Forest	271.7	274.0	257.5	256.8	241.0	240.3	304.6	288.1	303.9	287.4	304.3	304.0
Hayfield	176.7	176.7	184.7	184.7	142.2	142.2	231.5	189.0	231.5	189.0	158.9	175.7
Developed Land	62.2	61.8	64.3	63.9	67.9	67.5	78.8	82.4	78.4	82.0	166.9	149.6
Unmapped	29.8	39.8	22.1	22.1	24.8	24.8	22.1	24.8	22.1	24.8	28.3	20.1
Fence Row	140.3	127.0	159.2	145.9	150.2	136.9	163.5	154.5	150.2	141.2	291.2	266.5
Shrubland	5.5	5.5	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.7	6.5	9.0
Wetland	3.7	3.7	8.6	8.5	8.7	8.6	8.9	9.0	8.8	8.9	15.6	15.8
Floodplain Forest	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	10.8	10.8
Non-native Grassland	3.2	3.2	4.0	4.0	4.0	4.0	9.4	9.4	9.4	9.4	24.3	19.2
Forbland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Native Grassland	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	2.3	2.3
Tree Plantation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6
Total Acres	2,897.1	2,878.3	3,096.3	3,060.8	3,042.6	3,007.1	3,006.8	2,953.1	2,971.3	2,917.6	2,954.2	2,926.3
Total Hectares	1,174.2	1,164.8	1,255.2	1,240.8	1,234.9	1,220.5	1,218.8	1,198.5	1,204.3	1,184.1	1,198.2	1,187.0

Note: Total cover type impacts are presented in both metric and English units. The Preferred Alternate is highlighted.

Source: The Louis Berger Group, Inc., 2002.

from 40 to 100 years in age. Once the restoration is started it will take up to 40 to 60 years to achieve a submature forest on these types of slopes.

Other parcels that are being considered are isolated from other areas of forest. These areas will not attract Neotropical migrants but will provide oases in an otherwise agricultural landscape. The goal of the mitigation is the long-term restoration of upland forest dominated by species of oak and hickory.



Native Grassland

The proposed project will impact one dolomite hill prairie. This impact is common to all alternates (Table 4-9). The site is approximately 5.4 hectares (13.4 acres) in size and is dominated by little bluestem and eastern red cedar. Approximately 0.4 hectares (1.0 acre) of dolomite hill prairie will be located within the highway right-of-way but outside the proposed pavement area. **Of these 0.4 hectares (1.0 acre), 0.3 hectares (0.8 acres) have native grass.** Work at this location will involve a 10-foot vertical cut through the top of the bluff. The site could be impacted by blasting and related earthwork.

The Department will pursue acquisition of a conservation easement for a portion of two farm tract parcels (T-2453 and T-2454) located immediately adjacent to the dolomite hill prairie that will be on the states right-of-way. The easement will be sought in order to protect approximately 10.1 hectares (25 acres) of the remaining dolomite prairie. Although the Department will seek the easement, cooperation from the landowner(s) will be required, as well as a commitment from a conservation organization to manage the site once it has been designated for protection (see Section 4.15).

The Department will also purchase the 4.21 hectares (10.4 acres) landlocked parcel (T-1356) located north of Buckhill Road (between right Station 649+00 and 666+00) for the establishment of a mesic prairie. A prairie mitigation plan will be prepared and coordinated with IDNR for this site. This action will mitigate the 0.4 hectares (1.0 acres) of native grassland that will be impacted by the Preferred Alternate.

However, the dolomite hill prairie is not within the footprint of any proposed cut or fill activity and, therefore, the potential to minimize direct impacts exist. It is likely that this impact may be further minimized during the detailed design phase by placing a high priority on further reducing any impacts. During construction the impacts may be minimized by restricting construction activities to avoid the dolomite hill prairie as much as the design plans allow. The Department will work with the IDNR to provide long-term protection to this site. This addresses comment 8 in Section 5.4 in this FEIS.

Wildlife Resource Impacts

Wildlife impacts were assessed from the standpoint of construction impacts and subsequent use of the proposed highway. Construction of the Preferred Alternate will result in impacts to wildlife through the loss and alteration of existing vegetation and habitat. Construction impacts to wildlife have been assessed in terms of the acreage of habitat directly impacted. This includes the fragmentation and isolation of existing habitat, the disruption of wildlife movement, and the mortality of individual wildlife species during construction and subsequent roadway use (vehicle-wildlife crashes). These impacts will mostly occur to wildlife species that are common within the project area.

Habitat Loss

Loss of wildlife habitat can be measured through estimates of cover type losses that support wildlife. Construction of the Preferred Alternate will result in the loss or conversion of several cover types within the right of way that support various wildlife species (Table 4-9). Upland and floodplain forests, wetlands, and prairies are the more valuable and least impacted habitats within the project area. The Preferred Alternate will impact a large percentage (>80 percent) of agricultural land, hayfield, and pasture which generally have a lower value as wildlife habitat.



Habitat Fragmentation

Fragmentation of habitats is often a concern for roadways constructed on new alignments. The largest, contiguous forested areas are present in the Tapley Woods Land and Water Reserve. The Preferred Alternate will fragment an approximately 158 hectares (390 acres) upland forest located just west of the Tapley Woods Land and Water Reserve. Approximately 10.5 hectares (26 acres) of interior forested area will be lost and approximately 1,920 linear meters (6,300 linear feet) of edge would be created. These impacts will result in the loss of Neotropical migrant and bird-breeding habitat. The resulting edge effects will allow predation and nest parasitism to penetrate approximately 91 meters (300 feet) further into the forests. Area sensitive breeding birds such as vireos, ovenbirds, thrushes and warblers would be affected.

The direct and indirect loss of potential breeding habitat for neotropical migrant bird species will be mitigated in several ways. First, the inadvertent loss of nesting birds in the construction area will be avoided by the imposition of a tree clearing restriction. Tree removal will not be allowed between April 15 and September 5 of any given year (Table 4-10 Neotropical migrant breeding dates). This restriction only applies to the area west of Smallpox Creek to west of Furnace Creek containing habitat for Neotropical migrant species. Secondly, the loss of habitat will be mitigated by the purchase of approximately 200 acres of land adjacent to the Tapley Woods Land and Water Reserve (see Section 4.15). The acquisition of this land could reduce the edge effect and improve nesting success in the Land and Water Reserve. Of these 200 acres, 97 of these acres are not forested. These acres will be restored to upland forest. Thirdly, the Department will consult with the IDNR concerning the future of existing U.S. 20, which currently divides the Tapley Woods Land and Water Reserve. The drop in traffic volumes on this route may provide additional management options for Neotropical migrants in this area.

TABLE 4-10
NESTING SEASON DATES* FOR NEOTROPICAL MIGRANTS KNOWN TO OCCUR IN THE PROJECT AREA, JO DAVIESS COUNTY, ILLINOIS

Species	Habitat	Nesting Season Dates	
		From	To
cerulean warbler	upland/bottomland forests	15 April	1 August
hooded warbler	bottomland forests	1 May	15 July
ovenbird	upland forests	1 May	15 July
wood thrush	wooded bottomlands	5 May	1 August
chestnut-sided warbler	brushy second growth forests	5 May	1 July
American redstart	bottomland forests	5 May	1 August
yellow-throated vireo	Forests	5 May	1 August
red-eyed vireo	upland/bottomland forests	10 May	15 July
Kentucky warbler	upland/bottomland forests	10 May	1 August
blackpoll warbler	Forests	10 May	15 August
scarlet tanager	upland/bottomland forests	10 May	1 August
yellow-billed cuckoo	woodlands, orchards	15 May	5 September

*Data compiled from H. David Bohlen, The Birds of Illinois (1989)

Barriers to Movement

A wildlife movement (or dispersal) corridor has been defined as a linear habitat the primary function of which is to connect two or more important areas of habitat (Harris and Gallagher 1989). Linear habitats, such as fence rows, rights-of-ways, and stream corridors provide habitat



for resident animals. Resident individuals may use a corridor, but it must be used by animals for travel (through their home ranges), dispersal, or migration. No such corridors were identified within the project area for white-tailed deer. It is expected that most movement of wildlife in the project area is by using stream corridors and drainage ways. The construction of a highway through a corridor could restrict the movements of some animals and might lead to an increase of road kill as individuals attempt to move along the corridor.

The Department initially attempted to identify important wildlife corridors within the project corridor. Due to the absence of multiple important or protected habitats linked by a corridor, no specific important wildlife corridors could be identified. The Department also examined records of reported whitetail deer-vehicle collisions along the length of U.S. Route 20 in Jo Daviess and Stephenson Counties. The deer-vehicle collision data does not indicate concentrated locations of deer-vehicle collisions that would suggest a particular area is serving as a wildlife corridor.

Wildlife movement within the project area probably occurs over shorter distances along abandoned railroad grades and riparian areas along stream corridors. Within the Tapley Woods area, the construction of any one of the proposed alternates will affect the movement patterns of larger mammals such as whitetail deer, red and grey fox, bobcat and coyote. The construction of a highway through a wildlife corridor will lead to an increase in wildlife collisions with vehicles.

Bridged stream and river crossings will maintain several potential wildlife movement corridors within the project area. **The movement of wildlife throughout the Preferred Alternate alignment has been identified and accommodated by proposed longer span bridges that do not impact riparian areas adjacent to rivers and streams, oversizing proposed drainage culverts under the proposed roadway to accommodate wildlife crossings and the proposed installation of crossings not required for drainage purposes to accommodate wildlife.**

Operational Mortality

Impacts to wildlife populations due to vehicle collisions are a potential consequence of the project. The majority of wildlife/vehicle collisions would involve common wildlife species. **Over the last 10 years, approximately 20 percent of the accidents along existing U.S. Route 20 were collisions with animals, predominantly deer.**

Generally, vehicle/animal collisions occur because roadways traverse areas of habitat used by animals. These collisions are magnified when sight distances along roadways are impaired by vertical and horizontal curves, poor lighting at dusk, and during inclement weather conditions. The Preferred Alternate (Alternate 2) and other alternates would have similar effects with regards to vehicle/animal mortality. All of these alternates would be expected to reduce vehicle/animal collisions because they will have much improved sight distances and traverse less habitat types preferred by wildlife. An area of high habitat value occurs adjacent to the Tapley Woods Land and Water Reserve between Smallpox and Furnace Creek. In this area, the installation of a number of wildlife underpasses is being proposed (see Section 4.15).

Construction Impacts

Construction activities that will affect wildlife within the project corridor include the clearing of vegetation, vehicle movement, and construction activities and blasting associated with rock cuts.



Mortality of small rodents and herpetofauna are expected to occur during the construction of the roadway, however, the populations of these animals are expected to recover quickly based on their natural fecundity and the abundance of habitat for these species. Avifauna and larger wildlife species will also experience a loss of habitat and likewise a loss of individuals through a reduction in the carrying capacity of available habitats. This effect would be more pronounced within the avifauna community. **A tree clearing restriction in the Tapley Woods Land and Water Reserve will minimize this effect.** Considering the small amount of habitat affected the loss of individual wildlife and habitat should not have a meaningful affect on existing wildlife populations.

- **Threatened and Endangered Species**

A letter dated July 18, 2003, from IDNR indicated that the project as described in the DEIS will not have any adverse impacts on Illinois endangered and threatened species. The commitments made in the DEIS concerning the timber rattlesnake will be incorporated into the projects design and construction phases (see Commitment Section).

Since the circulation of the DEIS two additional species have been added to the state list, Franklin's ground squirrel and the cerulean warbler. The habitat for Franklin's ground squirrel consists of tall, dense cover of grasses, forbs, shrubs and small trees; they avoid the short grass of grazed pastures or mowed areas. In the project area suitable habitat could be the prairie areas along the railroad right-of-way and the dolomite hill prairies. The project will impact approximately 0.8 acres of hill prairie. The hill prairie does not contain the dense cover required by the squirrel. Franklin's ground squirrel has not been reported from Jo Daviess County since 1943. Based on this information, we conclude that the project will not impact the Franklin's ground squirrel.

The cerulean warbler is known from Tapley Woods. This species could occur in the adjacent forested areas that will be impacted by the proposed project. To avoid killing the species during construction, a tree clearing restriction will be put into place. Tree removal between April 15 and September 5 of any given year between Smallpox Creek and Furnace Creek will be prohibited. This will avoid the nesting season of the cerulean warbler. Robinson (1994) indicated that the acquisition of land around Tapley Woods could reduce the edge effect and improve nesting success within the Land and Water Reserve for cerulean warblers. With the tree clearing restriction in place and the purchases of approximately 200 acres of land adjacent to the Land and Water Reserve, we have determined that the project will not affect the cerulean warbler.

- **Invasive Species**

The construction of the proposed project will create conditions that may allow for the establishment of populations of invasive/nuisance species of plants that already occur within the project area. Invasive or nuisance species can establish on the right of way during initial highway construction or afterwards due to maintenance practices. **The Department has adopted practices to minimize the introduction and spread of invasive plant species. The Department controls invasive plant species by the application of herbicides as discussed in the DEIS. The Department uses a conservation seed mix composed of smooth brome grass and vernal alfalfa on highway foreslopes. The use of this mix makes it easier to maintain and is more cost effective. All backslopes are planted with a native prairie grass seed mix. Native plant materials will be used in specific locations, such as upland forest and prairie restoration sites, landscape plantings, and in other areas as identified through the continuous review of this project.**



4.7 Surface Water Resources and Water Quality

Construction Impacts

The Preferred Alternate will involve the construction of **87** permanent structures (**18** bridge and **69** culverts) over the waterways within the project area. **The following streams will be bridged: Hughlett Branch Creek, Galena River, Tributary Galena River, Tributary Smallpox Creek, Smallpox Creek, Tributary Longhollow Creek, Furnace Creek (mainline US 20 and IL 84 Extension), Apple River, two Tributary's Apple River, three Tributaries Welsh Hollow Creek, Rush Creek, Tributary Yellow Creek, and Yellow Creek (mainline US 20 and Stees Road).** It is anticipated that a maximum 12.2-meter (40-foot) causeway will be installed adjacent to each proposed bridge location to allow for construction vehicle access. In-stream construction work will include temporary access and dewatering structures. Appropriate measures will be taken to maintain near normal downstream flows and to minimize flooding. Fill will be clean aggregate, and placed in a manner that will not be eroded by expected high flows and will not cause more than minimal adverse effects on aquatic resources. **A total of 61 culverts (box and/or pipe) will be installed in the smaller tributaries within the project area. The sizes of the culverts have yet to be determined, but will be based on the size of the watershed size above the stream crossing. Culvert lengths range from approximately 76.2 meters (250 feet) to 396.2 meters (1300 feet) in length. During the placement of some of these culverts, the stream channel will be channelized.** Where possible, culverts will be utilized to minimize the fill material placed and maintain flows. Temporary fill and channel changes will be entirely removed and dredged material returned to its original location, following completion of the construction activity. The affected areas will be restored to the pre-project conditions.

In order to minimize impacts during construction, temporary and permanent erosion and sediment control measures will be implemented at sites that expose areas of soil to erosion. The Department has established guidance and procedures to ensure compliance with FHWA regulations on erosion and sediment control and the fulfillment of commitments for erosion and sediment control associated with regulatory and natural resource agencies. In addition, a National Pollutant Discharge Elimination System (NPDES) Storm Water Permit for Construction Activities is required for this project, as described on page 4-27.

In order to minimize impacts to aquatic biota during the construction phase and prevent impacts to water quality, temporary and permanent erosion and sediment control measures will be implemented at sites with areas of exposed soils. Potential impacts to fish will be further reduced by conducting any in-stream work outside of the fish spawning periods, approximately April through July. During construction, the crossing of streams by construction vehicles will be in accordance with current IDOT standards and special provisions. **The project is not expected to exceed the potential TMDL program goals of the impaired streams in the project area. With regards to the Galena River, the designated uses (aquatic life, fish consumption, swimming) impairments are potentially caused by pH, PCB's, pathogens, suspended solids, and habitat alterations (other than flow). The potential sources of these impairments are from agriculture, urban runoff/storm sewers, channelization, and unknown sources. The proposed construction of a bridge over the Galena River will not contribute to the above-mentioned impairments. Potential highway impacts are not associated with pH, PCB's, pathogens, or suspended solids. Habitat alteration of the Galena River will consist of permanent loss of trees along the banks of the river (area under the bridge) and pier placement within the river (loss of substrate). Temporary impacts will occur with placement and removal of clean, aggregate material to be used in causeways across the river for construction equipment. Once construction has been**



completed the river bed will return to its original conditions. The roadway drainage system will consist of open, vegetated ditches. No storm sewers/urban runoff will be associated with the roadway. The Apple River and Yellow Creek are impaired by pathogens from unknown sources. The project will not contribute to a potential increase in pathogens. The Pecatonica River is not crossed by the project. The project is not expected to exceed the potential TMDL program goals for these three streams.

- **Apple River Crossings**

The proposed crossing of the Apple River, a candidate National Wild and Scenic River, will be dual bridges spanning the river and nearby Apple River Road. One bridge will carry two eastbound lanes of traffic, and the adjacent structure will carry two westbound lanes of traffic. It is anticipated that the substructure units for both bridges will consist of open abutments protected by wire reinforced concrete slopewalls and seven reinforced concrete piers. It is anticipated that the two easternmost piers will extend parallel along each bank of the Apple River straddling the river. These piers may be outside or within the waterway. Final design criteria will determine the exact locations. The remaining five piers west of the Apple River will likely be within the river's floodplain.

The final overall bridge lengths, number of spans, number and types of substructure units will be determined during the final design phase. The bridges will be designed to avoid and minimize impacts to the **free flow condition**, scenic and recreational values of the Apple River.

Operational Impacts

Vehicles, dustfall, and precipitation are the major sources of pollutants that accumulate on roadway surfaces, median areas, and adjoining rights-of-way during operation and that are constituents of highway stormwater runoff (FHWA 1996). FHWA-sponsored research has demonstrated the key factor in highway runoff pollutant loadings is impervious surface area (FHWA 1990).

Studies by the FHWA indicate that pollutants in highway runoff are not present in amounts sufficient to threaten surface water or groundwater quality where the average daily traffic (ADT) is less than 30,000. Recent research by FHWA (RD-88-006-9) concluded that paved rural roadways with ADT under 30,000 had only minor impacts, if any, on the water quality of the receiving waters. The proposed Alternates have a projected ADT ranging from 11,600 to 20,000, **with the percentage of trucks ranging from 6.3 to 9.2**, in the year 2020.

The IEPA has assessed surface water quality in the project area. IEPA Use Assessment criteria indicate that most of the streams in the project area are in Full Use. The impact of existing roadway runoff to existing surface water quality in project area watersheds is small and not adverse. It is not anticipated that increases in impervious surface area due to the proposed project will adversely impact surface water quality.

Although adverse impacts to surface water quality are not expected, features are incorporated into the roadway design that will reduce stormwater runoff loadings. Proposed designs include grassed medians and roadside ditches. These features will reduce pollutant loadings to nearby waterways. FHWA (1996) states that, in general, a well-designed, well-maintained grassed swale system can remove 70 percent total suspended solids, 30 percent total phosphorus, and 50 to 90 percent trace metals.



Maintenance Impacts

- **Deicing Salt**

Deicing salt, along with plowing and sanding, are seasonal tools for highway snow and ice control. Deicing salt produces important public mobility and safety benefits by rapidly and reliably providing more drivable and less hazardous road conditions during the winter months.

Surface runoff is the primary mode of road salt removal. Runoff from the roadway and adjacent right of way is directed to the highway drainage system before outletting into a stream. Potential impacts of deicing salt from highway runoff include effects on stream water quality and aquatic biota.

Water quality data for area streams indicated that the existing annual chloride levels of the streams in the project area range from 5 to 50 parts per million (ppm). The state water quality standard for chloride is 500 ppm.

The proposed project would increase the number of lane-miles in the project area, thereby increasing the total salt loading over current levels. This would result in an increase in the delivery of chloride ions to the streams in the project area. **However, roadside ditches will be placed to avoid discharges into karst features (sink holes, bedrock fractures).** This increase would range from three to 22 ppm, depending on the stream size and the intensity and frequency of winter storm events.

These impacts are considered seasonal and should not create violations to state water quality standards (chloride and aquatic life).

- **Herbicides**

Operational impacts also include the application of herbicide. The herbicides Tordon 101, Garlon 34, and Vanquish are currently used for control of noxious and nuisance weeds. These herbicides are used for spot spraying applications. Only one type of herbicide is actually applied to any given spot within a year.

Impacts caused by weed spray applications are considered minor. Spraying is not allowed at stream crossings, ponds or other water bodies crossing or adjacent to the highway right of way.

Spraying is prohibited within 150 feet of a state listed Natural Area or an occurrence of threatened or endangered species. Areas proposed for weed spraying are coordinated with the Illinois DNR.

Permits

Permits include the U.S. Army Corps of Engineers' (Corps) Section 404 permit, IEPA Water Quality Certification, and the IDNR Water Resource Permit. Under Section 404 of the Clean Water Act, the Corps regulates the discharge of dredged and fill material into waters of the United States, including wetlands. The Corps issues either an Individual or a Nationwide permit. An Individual Permit is usually required for potentially substantial impacts, whereas Nationwide Permits allow for minor impacts, provided specific conditions to minimize impacts are met. However, for most road crossing discharges with only minimal adverse effects, the Corps often grants an up-front Nationwide Permit 14. The IEPA Water Quality Certification provides for the protection of water quality through Section 401 of the Clean Water Act for activities that involve



the placement of fill within wetlands and surface waters. The IEPA has provided blanket certification for National Permit 14, but requires individual certification for Individual Section 404 permits and Nationwide Permit 33.

It is anticipated that the Preferred Alternate will result in the disturbance of 0.4 or more hectares (one or more acres) of total land area. Accordingly, it is subject to the requirement for a (NPDES) permit for stormwater discharges from the construction sites. Permit coverage for the project will be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit No. ILR10) or under an individual NPDES permit.

In conjunction with the NPDES Storm Water Permit for Construction Site Activities required for this project, a Storm Water Pollution Prevention Plan will be developed. Such a plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the construction site. This plan shall describe and ensure the implementation of practices, which will be used to reduce the pollutants in discharges associated with construction site activity and to assure compliance with the terms of the permit.

4.8 Floodplains

A total of eight transverse crossings and four longitudinal crossings will result from the Preferred Alternate. The Preferred Alternate (Alternate 2) crosses the Galena River, Smallpox Creek, Furnace Creek (two encroachments), Apple River, Yellow Creek Tributary A, Yellow Creek (two encroachments), Yellow Creek Tributary D (3 encroachments) and Pecatonica River Tributary. Of the 12 encroachments, eight will involve the construction of bridges (Galena River, Smallpox Creek – 2 locations, Furnace Creek, Apple River, Yellow Creek Tributary A, Yellow Creek – 2 locations) within the floodplain. The permanent work in the floodplain involves the placement of bridge piers and roadway embankment. These areas and volumes are depicted in Table 4-11. Temporary fills will consist of causeways and will be removed and disposed of outside the floodplain. Four encroachments involve no structures. These encroachments involve the placement of roadway embankment at the margins of the floodplains of Yellow Creek Tributary D (three areas) and the Unnamed Tributary to the Pecatonica River. A summary of the impacts at each crossing location by the Preferred Alternate is provided in Table 4-11, and a summary of the impacts by the Preferred Alternate in comparison to the Alternates evaluated in the DEIS, please see Section 4.8, is provided in Table 4-12. There are no regulatory floodways in the project area.

The floodplains in the project area are mostly agricultural in nature. Cover types within the floodplains are dominated by pasture, hayfield and agricultural land. These cover types provide beneficial floodplain values with regard to agricultural production, some wildlife support, and flood moderation. As stormwater tops the banks of a river or stream and spreads out over the floodplain, the flow velocity decreases and the storm peak is reduced. This helps to alleviate the impact of flooding downstream. With the flow velocity decreased the amount of bank erosion also decreases. The floodplains in somewhat natural condition provide nesting and foraging habitat and cover for wildlife.

In accordance with the intent of federal Executive Order 11988 on floodplain management, efforts have been made to minimize floodplain impacts. The longitudinal floodplain encroachments for each alternate are unavoidable. Attempts to minimize the unavoidable longitudinal encroachment impacts are explained below.



**TABLE 4-11
FEMA 100-YEAR FLOODPLAIN IMPACTS – PREFERRED ALTERNATE**

Section	Sheet No.	Stream	Embankment Area M ² (Ft ²)	Piers Area M ² (Ft ²)	Total Area M ² (Ft ²)	Approximate Volume of Fill M ³ (Ft ³)	Crossing Type
A-B	5	Galena River	0	162 (1,742)	162 (1,742)	394 (13,914)	Transverse
B-F	9,10	Smallpox Creek	0	81 (871)	81 (871)	123 (4,344)	Transverse
B-F	8,29	Furnace Creek (IL 84 extended)	0	121 (1,307)	121 (1,307)	74 (2,613)	Transverse
B-F	30	Furnace Creek	3,440 (37,026)	162 (1,742)	3,602 (38,769)	4,012 (141,682)	Transverse
H-J	32	Apple River	0	202 (2,178)	202 (2,178)	1,541 (54,420)	Transverse
H-J	93	Tributary A to Yellow Creek	1,295 (13,939)	81 (871)	1,376 (14,810)	665 (23,484)	Transverse
H-J	94	Yellow Creek	2,995 (32,235)	202 (2,178)	3,197 (34,413)	1,102 (38,952)	Transverse
H-J	94	Yellow Creek (Steers Road)	8,417 (90,600)	0	8,417 (90,600)	25,820 (911,800)	Transverse
H-J	94	Tributary D to Yellow Creek	405 (4,356)	0	405 (4,356)	863 (30,477)	Longitudinal
H-J	94	Tributary D to Yellow Creek	2,792 (30,057)	0	2,792 (30,057)	1,701 (60,070)	Longitudinal
H-J	94	Tributary D to Yellow Creek	405 (4,346)	0	405 (4,356)	247 (8,723)	Longitudinal
J-K	114	Unnamed Tributary to Pecatonica River (AYP Road)	9,955 (107,158)	0	9,955 (107,158)	6,065 (214,184)	Longitudinal - TCE
TOTAL			29,704 (319,717)	1,011 (10,889)	30,715 (330,617)	42,607 (1,504,663)	12 Crossings

Note: The above-referenced sheets are contained in the Exhibits as part of the DEIS.

Source: The Louis Berger Group, Inc., 2002.

**TABLE 4-12
100-YEAR FLOODPLAIN IMPACTS BY ALTERNATE**

Alternate	Number of Crossings	Embankment Area M ² (Ft ²)	Piers Area M ² (Ft ²)	Total Area M ² (Ft ²)	Approximate Volume of Fill M ³ (Ft ³)
1	12	29,704 (319,717)	1,011 (10,889)	30,715 (330,617)	42,607 (1,504,663)
2	12	29,704 (319,717)	1,011 (10,889)	30,715 (330,617)	42,607 (1,504,663)
3	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
4	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
5	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
6	11	31,928 (343,670)	768 (8,267)	32,697 (351,948)	45,140 (1,594,079)
7	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
8	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
9	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
10	11	30,350 (326,685)	808 (8,697)	31,159 (335,393)	42,959 (1,517,058)
11	10	34,113 (367,189)	483 (5,199)	34,596 (372,388)	19,491 (688,318)
12	10	41,478 (446,466)	483 (5,199)	41,961 (451,664)	23,978 (846,775)

Source: The Louis Berger Group, Inc., 2002.

Note: The Preferred Alternate is highlighted.



In Section H-J, there are three separate longitudinal encroachments of the Yellow Creek Tributary D floodplain because of locating the Alternate along property lines. The alignment was established to minimize farm severance and disruption to residences and businesses along the entire route. Between stations 4050 and 4575, the proposed alignment shifts to the north to minimize the severance to an existing farm, avoid the farmstead and minimize floodplain impacts. Moving the alignment entirely out of the floodplain would affect the farmstead as well as access to the farmstead from Stees Road. Therefore, the balance between impacts to the farm and farmstead and the encroachment into the floodplain of a tributary to Yellow Creek was reached with the proposed alignment. The proposed project is not expected to generate incompatible floodplain development, which is closely regulated by the Jo Daviess County Floodplain Ordinance, the Stephenson County Floodplain Ordinance and various state and local regulations and ordinances.

In Section J-K there is a longitudinal encroachment of the unnamed tributary to the Pecatonica River. The existing alignment of Ayp Road is being maintained in this area to minimize impacts to surrounding agricultural properties. The proposed project is not expected to generate incompatible floodplain development, which is closely regulated by state, county and local regulations and ordinances.

A hydraulic analysis was conducted to ensure that floodwater surface elevations of the crossings proposed by the various alternates would not increase floodplain elevations by more than 0.3 meters (1.0 feet) (Berger, July 2001). In addition, the drainage structures proposed in this project will cause a minimal increase in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values; they will not result in any significant change in flood risks or damage; and they do not have significant potential for interruption or termination of emergency service or emergency evacuation routes; therefore, it has been determined that the encroachments are not significant.

Individual Permits from the IDNR Department of Water Resources will be needed for development in floodplains. Individual Permits will be needed for a stream that is located in a rural area and the drainage area for the stream is greater than 2,590 hectares (10 sq. miles), a stream that is in urban area and the drainage area of the stream is greater than 259 hectares (1 sq. mile), or any channel realignments.

Only Practicable Alternative Finding

In accordance with Executive Order 11988 (Floodplain Management) and 23 CFR 650, Subpart A (FHWA regulations) the project has been evaluated for floodplain impacts. The project involves eight transverse and four longitudinal floodplain encroachments. Some of the alternatives that were studied avoided the longitudinal encroachments, but these had greater impacts to other environmental features (wetlands, upland forest). The Preferred Alternate (Alternate 2) conforms to all applicable State and local floodplain protection standards. Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in floodplains, and that the proposed action includes all practicable measures to minimize harm to these resources.



4.9 Wetlands

Impacts to wetlands were identified by overlaying the proposed alignments on the wetland delineation maps. Impacts to wetlands were estimated by digitizing all wetland areas that occur within the project right of way.

Wetland impacts from highway construction were assessed for each of the Alternates that are evaluated in the DEIS (Table 4-11, Section 4.9). Impacts within the highway right of way include vegetation removal, placement of fill, soil compaction, excavation, sedimentation, and changes in wetland hydroperiod and species composition.

The Preferred Alternate has the least number of individual and acreage wetlands impacts. A total of 1.47 hectares (3.63 acres) from nine wetland sites. Alternates 11 and 12 have the most wetland impacts, 26 wetland sites totaling 6.33 to 6.41 hectares (15.64 to 15.84 acres), while the other Alternates (1, 3-10) impact from 11 to 17 wetland sites totaling 1.50 to 3.62 hectares (3.71 to 8.95 acres). Impacts to individual wetland sites are depicted in Table 4-45 (Impacts to Wetlands by Alternative) and Table 4-46 (Summary of Wetland Impacts by Alternate) of the DEIS.

The Preferred Alternate impacts a total of nine wetland sites consisting of four different plant communities. The plant communities consist of four sedge meadows totaling 0.98 hectare (2.40 acres), three wet meadows totaling 0.25 hectare (0.62 acre), one marsh totaling 0.25 hectare (0.61 acre) and one pond totaling 0.01 hectare (0.02 acre). Wetland impacts by alternate, wetland site and plant community are depicted on Table 4-13.

The Preferred Alternate impacts mostly wet and sedge meadows containing floristic quality indices between 4.1 and 20.8. These wetlands are generally located in higher positions of intermittent drainages or first order streams. The principal wetland functions associated with these wetland areas include water quality improvement (nutrient transformation and sediment retention), flood flow alteration (flood storage), and wildlife habitat. The effectiveness of each wetland to provide these situations is dependent upon the wetlands size, landscape position and level of disturbance.

A Section 404 permit from the U.S. Army Corps of Engineers (Rock Island District) will be required at each filled wetland site. Generally, wetland impacts greater than 0.2 hectares (0.5 acres) will require an Individual Section 404 permit. Those sites having impacts less than 0.2 hectares (0.5 acres) will qualify for the Nationwide Permit 14 (linear transportation projects). Water quality certification (Section 401) from Illinois EPA will be required at each impacted wetland site.

Measures to Minimize Harm

The Alternate alignments were developed with the goal of avoiding and minimizing impacts to wetlands and stream channels while at the same time meeting the goals of the purpose and need of the project. Wetland impacts have been minimized to the greatest extent possible at this stage of project design in a manner consistent with the project location criteria.

Further efforts to minimize wetland impacts will be incorporated into the design and construction of the Preferred Alternate (Alternate 2). These measures may include:



TABLE 4-13
IMPACTS TO WETLANDS BY ALTERNATE
(in hectares)

Wetland No.	1	2	3	4	5	6	7	8	9	10	11	12	Wetland Cover Type	
4	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		0.10	Wet Meadow	
15											0.06	0.06	Sedge Meadow	
17											0.09	0.09	Wet Meadow	
20											0.89	0.89	Sedge Meadow	
23											0.07	0.07	Wet Meadow	
24	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			Sedge Meadow	
25	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11			Wet Meadow	
29											0.11	0.11	Wet Meadow	
31											0.10	0.10	Wet Meadow	
51	0.02		0.02		0.02		0.02	0.02			0.02	0.02	Wet Meadow	
55											0.06	0.06	Marsh	
56											0.01	0.01	Wet Meadow	
57											0.02	0.02	Pond	
58											0.06	0.06	Sedge Meadow	
68											0.20	0.20	Wet Meadow	
69											0.58	0.58	Sedge Meadow	
71											0.12	0.12	Sedge Meadow	
79											0.05	0.05	Wet Meadow	
83	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03			Wet Meadow	
94					0.04	0.04		0.04		0.04			Pond	
118	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	Sedge Meadow	
120	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	Pond	
164			0.06	0.06	0.06	0.06							Wet Meadow	
168			0.21	0.21	0.21	0.21							Sedge Meadow	
178			0.75	0.75	0.75	0.75							Sedge Meadow	
185											0.37	0.37	Wet Meadow	
196			0.01	0.01			0.01						Sedge Meadow	
209	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	Sedge Meadow	
1s											0.02		Wet Meadow	
2s											0.65	0.65	Sedge Meadow	
3s											0.05	0.05	Wet Meadow	
5s	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25			Sedge Meadow	
6s	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25			Marsh	
10s							1.30	1.30	1.30	1.30	1.30	1.30	Sedge Meadow	
11s			0.79	0.79	0.79	0.79							Wet Meadow	
17s							0.36	0.36	0.36	0.36	0.36	0.36	Pond	
18s							0.42	0.42	0.42	0.42	0.42	0.42	Wet Meadow	
19s			0.15	0.15	0.15	0.15							Sedge Meadow	
TOTALS	Hectares	1.49	1.47	3.46	3.44	3.49	3.47	3.58	3.61	3.55	3.59	6.32	6.40	
	Acres	3.68	3.63	8.55	8.50	8.62	8.57	8.85	8.92	8.77	8.87	15.62	15.81	

Source: The Louis Berger Group, Inc., 2002. Note: The Preferred Alternate is highlighted.

- To the maximum extent possible, existing surface water drainage patterns will be maintained through the installation of pipes and culverts to maintain surface flows to wetland areas;
- Outlets of storm drains will be designed to minimize outlet velocities that might otherwise cause erosion and sedimentation;
- Excavation and filling operations will be conducted in a manner to minimize turbidity and sedimentation in the wetlands and natural watercourses. Placement of road embankments (filling) will be conducted in such a manner as to contain sediment at the fill area;
- The limits of the fill activity will be indicated on the final design plans and will be the absolute minimum necessary for the construction of the roadway;



- Equipment storage, temporary roads and stockpile areas will not be permitted within wetlands or adjacent to stream channels; any area proposed for use as a contractor-use-area will require a survey for identification of biological, cultural, and natural resource areas.
- A detailed soil erosion and sediment/stormwater control plan will be developed as an integral part of the construction plans. Emphasis will be given to the prevention of sediments from entering into wetlands and streams.

Wetland Mitigation

Mitigation for wetland impacts will follow the Department's Wetlands Action Plan as approved by the IDNR under the Illinois Interagency Wetland Policy Act and its implementing regulations. Under the State policy, all wetland impacts must be mitigated. State mitigation ratios are identified in the rules and are determined by the size of impact (over or under 0.5 acres) and the location of the mitigation site (on-site, off-site or out-of-basin). **The project is being processed as a standard action under the IDOT Wetlands Action Plan. This means that the project requires a compensation plan and that the project has to be coordinated with the IDNR. The compensation plan is to purchase credits from a wetland bank. This coordination took place with the circulation of the Draft EIS. The IDNR (letter dated July 18, 2003, Appendix) concurred that the project is in compliance with the Illinois Interagency Wetland Policy Act.**

The project is approximately 47 miles in length and crosses approximately 28 local watersheds. These local watersheds are part of two major watershed systems, the upper Mississippi River Basin and the Rock River Basin. The nine wetland sites occur in 5 different local basins. The individual wetland impacts are small in size. The restoration or construction of wetlands in each local watershed is not ecologically sound. Regulations allow the Department to consolidate wetland impacts at larger sites (wetland banks). The IDNR letter of July 18, 2003, concurred with the use of a bank site.

Wetland mitigation for this project will be carried out by the purchase of the required credits from the Kilbuck Creek Wetland Mitigation Bank site just south of Rockford, Illinois. Bank sites are created specifically for the purpose of wetland mitigation. Wetland banking provides for the consolidation of small wetland impacts into larger parcels, which have more ecological value and are more manageable.

The applicable mitigation ratios based on the use of Kilbuck Creek Mitigation bank are 2.0 to 1.0 (sites 4, 24, 25), 3.0 to 1.0 (sites 83 and 120), and 5.5 to 1.0 (sites 118, 209, 5S, and 6S). The total mitigation required for the Preferred Alternate is **7.18 hectares (17.75 acres)**.

Only Practicable Alternative Finding

This statement sets forth the basis for a finding that there is no practicable alternative to construction in the wetlands located along the project area. This finding is made in accordance with the requirements of Executive Order 11990 on the Protection of Wetlands dated May 24, 1977.

The project description, the description of wetlands, and wetlands affected are covered in the appropriate sections of the EIS. The Preferred Alignment (alternate 2) has the least number and acreage of wetland impacts. A total of nine wetland sites with the loss of 1.47 hectares (3.63 acres) will be affected. Measures to minimize harm to wetlands is outlined in the above Section. The draft EIS has been coordinated with federal and state agencies and the public. Two responses were received; the IDNR concurred with the



proposal and a member of the public believed mitigation should be done in the local watershed. Wetland mitigation is being proposed at a wetland bank. A total of 7.18 hectares (17.75 acres) of wetland credits will be purchased.

The above factors and considerations establish that there is no practicable alternative to construction in the wetlands of the project area, and that the highway proposal includes all practicable measures to minimize harm to the wetlands which may result from such use.

4.10 Special Waste

Alternate 2 (Preferred Alternate) will not involve nor impact any CERCLIS sites nor other sites potentially impacted with regulated substances.

4.11 Types of Permits

Federal – Section 404

Certain activities in the streams of the project area may require a Section 404 permit from the USACOE for the discharge of dredged or fill material into waters of the United States. The Corps issues either an Individual or Nationwide Permit. An Individual Permit is usually required for potentially substantial impacts.

State

Section 401 Water Quality Certification

All Section 404 permits require a Section 401 Water Quality Certification review by the IEPA. IEPA must approve or waive the water quality certification as a condition for issuance of an Individual Section 404 permit or for use of a Nationwide Section 404 permit.

Section 402 National Pollutant Discharge Elimination System Construction Permit

This project will result in the disturbance of two or more hectares (five acres) of total land area. Accordingly, it is subject to the requirement for a Section 402 National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from construction sites. Permit coverage for the project will be obtained either under the IEPA General Permit for Stormwater Discharges from Construction Site Activities (NPDES Permit No. ILR10) or under an individual NPDES permit.

Construction in Floodways of Rivers, Lakes, and Streams Permit

A permit for construction in regulatory floodways and public waters will need to be obtained from the Illinois Department of Natural Resources, Office of Water Resources. This permit is required for construction in the floodway of streams serving a tributary area of 259 hectares (640 acres) or more in an urban area or 2,590 hectares (6,400 acres) or more in a rural area.

Groundwater Management

Project related activities may be restricted in regulatory setback zones. IEPA has jurisdiction over setback zone restrictions and will need to be consulted regarding applicability for this



project. Proposed project related activities may be considered new potential sources of contamination. Waivers and exceptions to minimum setback zone prohibitions can be acquired.

Burning/Disposal Permits

A permit shall be obtained from IEPA prior to open burning of organic waste (i.e., plant refuse resulting from pruning or removal of trees/shrubs) or other construction or demolition debris. Organic waste originating within the right-of-way limits may be chipped or shredded and placed as mulch around landscape plantings within the right of way (IDOT 2001).

Demolition of Structures

IEPA requires notification of demolition and renovation of structures. As the proposed project will require building demolition, appropriate notifications and coordination will be required.

State Historic Preservation Office Approval

Archaeological and historical surveys were conducted as part of the project compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. State Historic Preservation Office coordination is provided in Appendix E of the DEIS.

Local

Groundwater Management

Local communities enforce nonregulatory groundwater management practices such as activity restrictions within Wellhead Protection Areas and zoning ordinances. Local communities will need to be consulted regarding the applicability of the proposed project.

4.12 Visual/Aesthetics

The alignment of the Preferred Alternate has been developed by taking into consideration the visual resource class objectives, as defined in Section 2.14 of the DEIS. The areas in which these objectives have not been met are generally found in Landscape Zone 1 (Upland Hills and Ridges) where topographic variation requires the use of structures and where the visual resource objectives are more demanding. In Landscape Zone 2 (Rolling Hills and Valleys) and Landscape Zone 3 (Illinois Prairie) most of the objectives are met except where drainage requires the use of small bridges and culverts.

Impact reduction measures will be considered where deemed practical and feasible in the final design of the Preferred Alternate.

The proposed project offers great potential for the inclusion of mitigation measures that allow for the improvement of U.S. Route 20 while blending into the existing landscape. The Preferred Alternate will be designed in such a manner as to create a scenic highway that compliments the visual character of the project area.

Apple River

The Apple River is listed as a candidate Wild and Scenic River by the National Park Service based on its Outstandingly Remarkable Values (ORV's). These ORV's include the rivers scenic, recreational, and geologic attributes. To determine potential project



impacts on these values we have chosen to look at the section of the river one-mile either side of the proposed crossing. We have considered both short-term (construction) and long-term (operational) impacts to these attributes.

During construction of the bridges, a causeway 40-feet in width will be used by construction equipment. It is expected that it will take two years to build the bridges and that causeways will be in place during that time. At that time, canoeing or floating on the river will be interrupted. This potential impact is considered minor and temporary.

After construction and during operation of the highway the scenic view from the river will be changed. Canoers, floaters, and anglers will see and hear activity associated with the bridge. An impact to the bluffs on either side of the Apple River will occur, as the proposed roadway will be embedded within the eastern bluff by 30 feet. On the west side, there will be approximately 1100 feet of fill placed from the margin of the floodplain to the bluff. As the roadway merges into the bluff it will transition into a 40-foot long cut through the bluff. This may be considered detrimental to the view and is considered a long-term impact. The view of the river from the new road is obscured by the common use of parapet walls instead of railing. Therefore, the scenic view from the bridge will not be available unless a more open bridge design is used. These potential negative impacts could be reduced by using a scenic bridge design, landscaping, and planting woody riparian vegetation in the adjacent Apple River floodplain.

Lighting

Project impacts on dark skies is limited. Lighting for the project will be established only at the eight interchanges. At these interchanges only partial interchange lighting will be installed. Lighting would occur at both ramp gores along U.S. Route 20 and at the ramp terminal intersections. The bridges over U.S. Route 20 at these interchange locations would also be lighted. The Department is considering "full cutoff" lighting that directs light only to locations where it is needed. The lighting will be on poles between 9 to 19.8 m (30 feet to 65 feet) in height. The lighting (lamps) will be high-pressure sodium (HPS). HPS lamps have excellent luminous efficiency, power usage, and long life. The HPS lamp produces a soft, pinkish-yellow light. This potential impact is considered minor but long-term.

4.13 Construction Impacts

Social

Short-term minor impacts to the traveling public and businesses adjacent to the construction sites are anticipated during the various phases of construction. However, for the most part, motorized and pedestrian traffic should not experience undue hardship as a result of construction activities.

The proposed project will result in the acquisition and displacement of several residences, farmsteads and business properties. Although the acquisition, demolition and relocation/reconstruction of these properties will occur prior to and during the construction phase, these impacts are considered to be long term, permanent and associated with both the construction and operation of the proposed project.



Air Quality

The primary potential impact on air quality from construction will be fugitive dust (particulate) resulting from soil exposed to wind and traffic. The quantity of fugitive dust from construction activities varies depending on the area of land being worked, the level of activity, the soil silt content, the soil moisture, and wind speed. While the contribution of the proposed project to the total suspended particulates in the surrounding area will be small and of a short-term duration, the construction will generate fugitive dust that may be a nuisance in nearby areas.

The Department has established a Special Provision for particulate matter impacts as described in the *Standard Specifications for Road and Bridge Construction, Section 107.36, Dust Control*. Under this provision, the dust and air-borne dirt generated by construction activities will be controlled under dust control procedures for a specific plan. The construction contractor and the Department will meet to review the nature and extent of dust generating activities and cooperatively develop specific types of control techniques to that specific situation. Sample techniques include such measures as minimizing tracking out of soil onto nearby publicly traveled roads, reducing vehicle speed on unpaved surfaces, covering haul vehicles and applying chemical dust suppressants or water to exposed surfaces, particularly to surfaces on which construction vehicles travel.

Noise

Trucks and heavy machinery used during construction will generate noise, which may affect some land use activities. However, because of the rural and agricultural character of the project area, these impacts will be minimal. In addition, specifications concerning construction noise as outlined in Article 107.35 of the Department's *Standard Specifications for Road and Bridge Construction* as adopted January 1, 2002, requires all machinery to be equipped with proper mufflers and that construction be limited to the period between 7:00 A.M. and 10:00 P.M. (within close proximity to sensitive receptors). These provisions also require contractors to observe and comply with all federal, state and local laws and all ordinances and regulations, which in any manner affect the conduct of the work.

Disposal and Borrow Pits

The proposed project will require fill, particularly for the elevated portions of the roadway and roadway embankments. Some of the fill material will be borrowed from those portions of the roadway where excavation may occur. Sources of additional fill, which will not be available from excavation, will come from one or more borrow pits that may be located within and adjacent to the project area. Limited disposal of fill resulting from excavation is anticipated. Any borrow source which might be considered for the proposed project will be archaeologically surveyed, surveyed for threatened and endangered species and wetlands and cleared prior to such use. The location and use of all borrow and disposal pits will follow the requirements and specifications as set forth in the Department's *Standard Specifications for Road and Bridge Construction*.

Temporary Access

Access to all properties will be maintained by staged construction temporary access roads, or other appropriate means. These measures will minimize inconvenience and financial loss resulting from construction activities. Coordination with local public officials and law enforcement groups will serve to limit any long term or adverse impacts to local circulation patterns during the construction period.



Utilities

Roadway construction could require the temporary or permanent relocation of utilities along the project corridor including; water supply, storm water collection, sewer collection and electrical, gas and oil distribution and transmission. Construction activities will be coordinated with public utilities in order to avoid crashes and minimize planned interruptions and service. When service interruptions are unavoidable, every effort will be made to limit their duration. Coordination of construction activities with local utility officials and the implementation of staged construction would ensure that continuous service is provided to local area residents.

Traffic and Circulation

Construction of the proposed project would occur in various construction stages for up to a fifteen-year duration. This construction could result in short-term impacts to local area residents and other users of U.S. Route 20, Illinois Routes 84, 78 and 73 and local roads throughout the project area. Potential short term impacts could include; detours, temporary congestion and longer travel times through the project area. A construction phasing plan and appropriate traffic control plan would be developed where needed as part of the final design to coordinate construction activities and minimize disruption of traffic flow and impacts for local residents and businesses. In addition, public awareness programs to inform local residents and motorists about potential construction delays and alternate travel opportunities would be implemented by the Department in cooperation with local officials.

Floodplains

During the construction phase, there is the potential for erosion of unprotected embankments from surface runoff and a risk of damage to unfinished drainage structures should flooding occur. Increased sediment deposition in creeks and rivers downstream is an associated impact. Best Management Practices will be employed to limit any potential for impact to the local creeks, streams and rivers which comprise the project area flood plains. In addition, all construction will be conducted pursuant the latest standards and guidelines as specified in the Department's *Standard Specifications for Road and Bridge Construction*.

Water Quality

The construction of the proposed project is not expected to result in any severe impacts to surface and subsurface water quality in the project area. Short-term increases in sedimentation and turbidity levels within surface water resources may be expected during construction in proportion to the proximity of excavated sites to surface water and the frequency of storms. However, turbidity and sedimentation are expected to return to baseline levels soon after construction. Temporary erosion and siltation control measures will be employed as needed to minimize silt loading and deposition in the nearby creeks, streams and rivers. Erosion control measures are specified in the Department's *Standard Specifications for Road and Bridge Construction* and recurring Special Provisions. These measures will be incorporated as part of the construction plans. Areas of high erosion potential will be identified during project design. Necessary erosion control measures will be incorporated into the construction plans as well.

Special Waste

The construction of the proposed project will require the excavation and disturbance of surface and subsurface soils. All appropriate measures will be taken to limit the potential for any



seepage of petroleum products from construction equipment into the local surface waters and drainage areas.

Solid Waste

Responsible construction practices will be followed to keep solid waste at a minimum through proper collection and treatment of waste material. Common disposal measures include hauling to landfills or open burning. Contractors must comply with all federal, state and local laws, ordinances and regulations. Open burning of landscape waste will require a permit from the Illinois EPA.

Cultural Resources

All construction activities, including but not restricted to access roads, construction camps, staging areas, maintenance areas, pipelines, detours, power lines, material storage areas and sources, waste and dump areas, etc., will be restricted to the cleared right of way prior to such use. This action is in keeping with federal regulations, which preclude the destruction of cultural resources when federal funds are involved. These actions shall serve to limit any potential impacts to cultural resources outside of the right of way.

4.14 Secondary and Cumulative Impacts

Secondary Impacts

One of the primary purposes of the proposed project is to provide a transportation facility that properly addresses existing and projected system deficiencies, and seeks to improve safety and efficiency. The growth of employment and tourism in the project area, plus increased truck traffic, and increased use of automobiles within the region, has led to traffic overcrowding and safety problems at several locations along this part of U.S. Route 20.

Induced development issues addressed below concern the degree to which the proposed project may influence development patterns at the regional and local levels.

- **Induced Regional Development**

In the project area, there are trends operating which may be as important, or more important, than highway accessibility. The most important of these trends is the attractiveness of Galena for tourism and the second-home market. This is counterbalanced by the long-term tendency of population and employment to remain static in Jo Daviess and Stephenson Counties. In this situation, several scenarios are possible. The proposed project could enhance the region's growth prospects because it facilitates travel here by tourists; or, growth could continue to be depressed by static population and employment, in spite of the improvements.

Another possible scenario is that the failure to implement the proposed project could negatively influence development: increased traffic congestion and crashes on U.S. Route 20 could have an inhibiting effect, making the area less attractive to businesses, tourists and second-home owners. In this scenario, there could be reduced or even negative growth. This scenario is a reasonable possibility, based on the perceptions of local business people and officials, as elicited in two recent surveys.

The proposed project may allow existing and projected development trends to continue as currently foreseen, rather than extensively altering them. If the proposed project is not



constructed, the limitations of the existing U.S. Route 20 may serve to limit future growth and development.

- **Induced Local Development**

Local development in connection with a new limited- or controlled-access highway may under certain conditions be expected to take place in the vicinity of interchanges. Research has been conducted concerning some specific types of land uses that might be expected to develop near rural interchanges. Other research concerns highway-related developments such as larger commercial land uses, including shopping centers and so-called “big-box” stores offering a variety of merchandise, and industrial and warehousing land uses. The proposed project is not expected to result in any considerable local induced development. The local land use regulations will serve to limit the potential for induced local development along and adjacent to the alignment and interchanges of the Preferred Alternate. Further detailed information regarding induced development is provided in Section 4.14 of the DEIS.

In local areas economic development growth can be encouraged by promoting local assets and ensuring a low cost and reliable regulatory process. Desirable development can be guided into growth areas using local land use planning and regulations and highway access controls. Undesirable forms of development can also be regulated through careful planning and land use regulation.

Cumulative Impacts

To assess cumulative impacts, other projects were considered to determine if they would change the impacts of the proposed project. Two types of projects were considered: highways and utility extensions. Either of these, depending on their location and size, could potentially alter the impacts of the proposed project.

- **Highway Projects**

The Transportation Improvement Programs (TIPs) of Illinois and Iowa were reviewed to determine if there are planned highway projects that could have an effect on U.S. Route 20. The TIPs contain schedules for transportation facility construction between 1999 and 2003, and also include planning studies and discussions of projects farther into the future.

Except for the proposed project, no other major highway capacity expansions are planned in the northwestern part of the state by the Department. Bridge replacements and resurfacings are planned on I-80 and I-74 in the Moline area, which will facilitate traffic movement in this key goods movement corridor. Resurfacing is also planned for the U.S. Route 20 bypass south of Rockford. None of these improvements, however, will add substantial traffic capacity.

Other major highway projects throughout Illinois were also considered. The majority of these improvements are in the resurfacing and reconstruction categories. The major capacity expansion projects are all located in distant parts of the state, and would have little impact on traffic along U.S. Route 20.

Several projects in Iowa could affect traffic on U.S. Route 20:

- *Bypass and New Mississippi River Bridge in Dubuque:* These improvements would extend from U.S. Route 20 west of Dubuque, crossing the Mississippi River and tying back into U.S. Route 20 in Jo Daviess County. Functioning as a bypass south of Dubuque, they would



relieve the current bottleneck where U.S. Route 20 passes through Dubuque. These projects are in the planning stage at present, and are not scheduled in the Iowa TIP.

- *U.S. Route 151 Corridor between Dubuque and Cedar Rapids*: U.S. Route 151 is being expanded to four lanes in this area. This could facilitate additional traffic movement between U.S. Route 20 in Illinois and Des Moines. The improvements are scheduled for completion in 2003.
- *The "Avenue of the Saints"*: This project is intended to connect the Twin Cities in Minnesota to St. Louis with a four-lane highway. Part of the project between Waterloo and Mason City, IA, an expansion of U.S. Routes 18 and 218 to four lanes, including by-passes of towns along the route, is scheduled for completion in 2003. This will provide additional traffic capacity from U.S. Route 20 in Waterloo to the I-35 corridor heading toward the Twin Cities.
- *U.S. Route 20 four-lane route across Iowa*: Plans call for making U.S. Route 20 entirely a four-lane highway crossing Iowa from Dubuque to Sioux City. A key link in this plan is the construction of about 64 kilometers (40 miles) of new four-lane highway between Waterloo and I-35, to be completed in 2004.

The completion of these projects comprises part of Iowa's "Commercial and Industrial Network", which is intended to "support economic development through transportation investments"⁹. The primary impact of these projects would be to facilitate goods movement, and hence truck traffic, along these routes, as noted above. All of the above projects tie into U.S. Route 20 in Illinois, and could facilitate truck movement to markets in Des Moines and west, and the Twin Cities and west, perhaps making U.S. Route 20 through the project area more attractive to truck depots and warehouses, thus increasing truck traffic.

However, there are several factors which will probably act to delay, or reduce, this impact. First, an important link in the Iowa network is the bypass south of Dubuque and the Mississippi River bridge. These projects are being planned now, and must pass through a NEPA EIS review before construction can start. Allowing five years for construction in addition to the review period would place completion of these projects into the indefinite future, perhaps even beyond the planning horizon for the U.S. Route 20 improvements (2020). Second, the I-80 corridor is the established east-west goods movement route in this region of the U.S. Increased congestion or highway deterioration on I-80 would be required to divert truck traffic from this corridor. By scheduling maintenance projects on I-80, the Department is taking measures to prevent this from happening. Third, I-90, the principal westerly route from Chicago to the U.S. Route 20 corridor, is a toll road. This can be a discouragement to truck traffic.

In view of this, considerable cumulative highway impacts associated with the proposed project are considered unlikely in the foreseeable future.

- **Air Quality**

No cumulative air quality impacts are anticipated. Since the proposed project will be phased construction and will be constructed independent of the other planned roadway projects, no construction related cumulative impacts are anticipated.

⁹ Iowa Department of Transportation, *1999-2003 Iowa Transportation Improvement Program*, 1999.



- **Noise**

Although some increased noise levels are anticipated within the project area from the operation of the proposed project, no cumulative or secondary impacts are anticipated. These proposed transportation projects are being considered by the States of Illinois and Iowa independently of the proposed project. Since the predicted future noise levels associated with the project considered the future traffic volumes of these planned improvements along with the proposed project, no secondary or cumulative impacts are anticipated.

- **Groundwater/Water Quality/Floodplains**

The proposed project along with the other proposed roadway improvements within and to the east and west of the project corridor will contribute in some measure to the loading of groundwater and nearby drainage areas with sediments and chemical pollutants. This impact will result from the paving of surface area and increase in impervious hectares (acres) in the project area. Where at all possible, Best Management Practices will be employed during construction. In addition, all construction activity will be conducted pursuant to the requirements as set forth in Section 107.01 of the Department's *Standard Specifications for Road and Bridge Construction* as well as the monitoring and guidance standards as set forth in the Department Water Quality Manual. Groundwater impacts would be localized without any cumulative impacts.

Water resources may also be affected by the volume and quality of runoff from secondary developments. Local storm water ordinances often require compensatory storage at rates greater than 1:1 for flood plain encroachments, thus actually increasing the available storm water storage. The hydrology of surface waters, recharge rates for groundwater, and runoff pollutant composition and concentration could change, depending on the type and extent of any secondary developments that may occur as a result of the proposed project. The type and magnitude of the changes depend on the type, density and location of the development. Secondary impacts from this development could also result in cumulative effect over time.

It is not anticipated that the proposed project will generate substantial growth or induced development. Although some development could occur at and around some of the proposed interchanges along the Preferred Alternate, no large scale commercial or industrial development or uncontrolled or substantial growth is anticipated. As a result, no meaningful secondary or cumulative impacts to water quality, flood plains or groundwater are anticipated.

- **Cultural Resources**

The proposed project is not expected to result in any secondary or cumulative impacts to historic sites or sensitive archaeological areas. At present, there are no other currently planned or proposed projects that would impact cultural resources sites, so that there are no cumulative impacts which would affect the viability of these resources.

- **Vegetation/Wildlife Habitat/Threatened and Endangered Species**

The proposed project is not expected to result in any meaningful secondary or cumulative impacts to vegetation, wildlife habitat or threatened and endangered species. The proposed project will result in direct impacts to vegetation, wildlife habitat and sensitive species. However, these impacts are not expected to be substantial. The potential for indirect or secondary impacts are not expected to be considerable. The proposed project is not expected to generate any new development or roadway projects other than those planned under the proposed project design. Since noise, air quality, storm water runoff and impacts to surface water resources are not



expected to be substantial, and, by introduction of Best Management Practices and appropriate mitigation, no unforeseen indirect or cumulative impacts are anticipated.

- **Wetlands**

Wetlands would be affected by changes in hydrology, water quality and as a result of the placement of fill. Secondary and cumulative impacts to wetlands could result from increased development other than the construction activities associated with the proposed project. Additional development would increase the chance that wetlands in the area would experience a decrease in water quality, which could affect the wetland habitat characteristics. These secondary impacts to wetlands may be tempered by the U.S. Army Corps of Engineers' regulations governing wetland permits, as well as local storm water management ordinances. Since project related impacts to wetlands will be governed by the regulations of the U.S. Army Corps of Engineers and the IDNR, and since the proposed project is not expected to result in any substantial growth and development, no cumulative impacts to wetlands are anticipated. However, some development may occur around and at several of the Preferred Alternate interchanges and intersections. This development could directly impact wetland areas. Under these circumstances, secondary impacts to wetland areas could result. However, local zoning ordinances and land use controls could serve to control and limit development in and around wetland areas. Federal permitting requirements will also serve to limit any meaningful secondary impacts to wetland areas within the project corridor.

The proposed project is also not envisioned as inducing development within wetlands which would result from the implementation of the planned road and interchange or intersection improvements by the State of Illinois. These road improvements are being planned independent of the proposed project. Although wetland impacts could result from these projects, federal and state permitting regulations and requirements would serve to limit the potential for cumulative impacts to these wetland areas. The potential for cumulative impacts to wetlands within the project corridor will also be offset by mitigation requirements through the replacement of wetlands of equal value and function.

- **Agriculture**

Agricultural land is located throughout the entire project area, except where upland forested areas, wetlands, other cover types, and developed land currently exist. The existing housing and recreational pressure is concentrated around the southern portion of the Galena Territory and just west of Woodbine. The likelihood of the existing agricultural land remaining in agricultural use seems good — at least for the foreseeable future.

4.15 List of Commitments and Mitigation Measures

The Department is committed to implementing the following mitigation measures for the impacts associated with the construction of the proposed project:

Wetland Loss: The Preferred Alternate will impact approximately **1.47** hectares (**3.63** acres) of wetlands. It is proposed to mitigate these impacts by purchasing wetland credits from the Kilbuck Creek Bank south of Rockford. This bank site is located within the Rock River Drainage Basin. It is estimated that approximately **7.18** hectares (**17.75** acres) will need to be purchased by the Department at a cost to be determined at the time of purchase.



Karst Features: During construction, if some of the Karst features are uncovered, the Department will analyze the situation and obtain a solution that will avoid these features becoming direct conduits for highway runoff to enter the groundwater.

Native Prairie Restoration: The Department will pursue acquisition of a conservation easement for a portion of two farm tract parcels located immediately adjacent to the dolomite hill prairie that will be on the states right-of-way. The easement will be sought in order to protect approximately 10.1 hectares (25 acres) of the remaining dolomite prairie. A prairie mitigation plan will be prepared and coordinated with IDNR for this site. Although the Department will seek the easement, cooperation from the landowner(s) will be required, as well as a commitment from a conversation organization to manage the site once it has been designated for protection.

The Department will also purchase the 4.21 hectares (10.4 acres) landlocked parcel (T-1356) located north of Buckhill Road (between right Station 649+00 and 666+00) for the establishment of a mesic prairie. The parcel will be seeded with native prairie vegetation using the appropriate species from Class 4 and 5 seeding mixture contained in the Department's "Standard Specifications for Road and Bridge Construction" (January 2002). A prairie mitigation plan will be prepared and coordinated with IDNR for this site. This action will mitigate the 0.4 hectares (1.0 acres) of native grassland that will be impacted by the Preferred Alternate.

Reforestation/Habitat Fragmentation:

The Department will purchase six parcels of land that are located between the Preferred Alternate and the Tapley Woods Land and Water Reserve. These parcels are parcel numbers T-694, T-697, T-2472, T-2806, T-2878 and T-3460. These six parcels total 209.5 acres, of which about 105 acres are not forested. The areas that are not wooded and are suitable for trees will be planted with native tree species. By planting forest vegetation on the parcels adjacent to Tapley Woods, a larger contiguous tract of forest will develop over time. This type of large block of forest is required by many species of forest birds to nest successfully. This mitigation should be beneficial to Neotropical migrant birds that nest in the project area as well as create a larger protected buffer area for the timber rattlesnake.

Also, the Department will purchase one landlocked parcel adjacent to the Horseshoe Mound Geological Natural Area (parcel number T-621) and one landlocked parcel near the wetlands along Rush Creek (parcel number T-1633). These two parcels have a total of 109.8 acres, with about 82 acres that are not forested. These areas would also be restored



with forest species. The addition of these two parcels to the adjoining parcels would expand the existing ecosystems of forested and wetland communities. A total of approximately 187 acres will be mitigated by reforesting the eight parcels listed above.

The Department will identify and acquire additional land areas with non-wooded sections, and plant trees for the express purpose of mitigating the overall impacts to wooded areas at an aggregate one to one ratio (planted to removed).

A tree/shrub replacement plan will be prepared and coordinated with IDNR.

This action will mitigate the loss of 110.9 hectares (274 acres) of forest due to the construction of the Preferred Alternate.

After planting, the Department will transfer these landlocked parcels (described above) to IDNR.

The Department will replant riparian trees and shrubs in the floodplains within highway right of way of the Galena River, Apple River, Smallpox Creek, Unnamed Tributary of Longhollow Creek, Furnace Creek, and Yellow Creek and its tributaries. The Department will also attempt to obtain agreements with the adjacent property owners to plant trees and shrubs on their property within the riparian corridor.

Wildlife Barriers:

In an attempt to eliminate some of the barriers created by the new roadway to wildlife movement, the bridges are being designed with longer spans. The spans will be extended to provide a minimum of 3 meters (10 feet) of dry ground above the 50-year flood elevation on each side of the stream. This will allow wildlife movement along the stream corridors.

At least seven culverts, especially those proposed near Stations 960, 1002, 1069, 1108, 1126, 1190, and 1215, will be constructed to have an opening that is wider than the normal stream channel. These culverts will be a minimum of 3 meters by 3 meters (10 feet by 10 feet) (depending on the "Openness Ratio for Deer"). This will allow for safe wildlife crossings including the timber rattlesnake in the Tapley Woods area.

The Department will install both medium and large sized culverts in some of the fill areas near Tapley Woods **and in other appropriate areas**. The specific locations will be determined as part of the Phase II design of the roadway. These culverts will not be associated with drainage, but will allow wildlife a safe passage across the roadway. These culverts will be a minimum of 1.5 meters by 1.5 meters (5 feet by 5 feet) for medium size and spread 152 to 274 meters (500 to 900 feet) apart, and 1.5 meters by 1.5 meters (10 feet by 10 feet) for large size that are spread 1 to 1.1 kilometers (0.6 to 0.7 miles) apart.



Fencing is an important component of wildlife crossings. The proposed project design includes the standard 1.2-meter (4-foot) high fencing along the right-of-way line. In addition to this fencing, a special 2.5-meter (8-foot) high fence will be installed at the wildlife crossings (culverts and bridges) to “funnel” wildlife into the crossings. Fencing will also be installed in the median, if the crossing (bridge or culvert) opens in the median, to prevent wildlife from getting onto the roadway.

Culverts constructed in the fill areas cannot be designed to open in the median. Since ambient light is a critical factor for usage of wildlife underpasses, light will be provided by placing two vaults near the center of the culverts. The vaults would be placed on the median slopes and would be grated. The grated vaults would be above the median ditch flow line to prevent excessive drainage into the culverts.

Timber Rattlesnake:

At least seven culverts, especially those proposed near Stations 960, 1002, 1069, 1108, 1126, 1190, and 1215, will be constructed to allow for safe crossing of the roadway by the timber rattlesnake in the Tapley Woods area.

A herpetologist from the Illinois Natural History Survey will be employed to determine whether or not the timber rattlesnake occurs within the construction limits before construction begins and during construction in the roadway section near the Tapley Woods Land and Water Reserve. The herpetologist will begin the survey about one month before construction begins. **Any rattlesnakes identified within the construction area will be relocated during construction.**

Neotropical Migrants:

The Department commits to including in the design plans special provisions prohibiting deforestation activities during calendar months when it may be harmful to migratory birds as shown in Table 4-10.

In the area from west of Smallpox Creek (Station 870) to west of Furnace Creek (Station 1210) there will be no tree removal between April 15 and September 5. All of the area-sensitive Neotropical migrant birds identified on the project occur within this section.

Public Involvement:

The Department commits to the Advisory Council’s recommendation “ensuring that a citizen advisory group is involved in the design and construction of the facility to ensure effective mitigation of the negative impacts of the project.” The Department also commits to actively pursue the involvement of the U.S. Department of the Interior as part of the public involvement.



Review and comment periods will be afforded to the citizen's advisory group during the project design phase.

Lighting:

Lighting for the project will be established only at the eight interchanges. At these interchanges only partial interchange lighting will be installed. Lighting will occur at the ramp gores along U.S. Route 20, the crossroad intersections, and the bridges at these interchange locations. The Department will provide "full cutoff" lighting that directs light only to locations where it is needed.

Visual/Aesthetics:

The Department will consider the use of scenic bridge design, landscaping, and the planting of woody riparian vegetation in the adjacent Apple River floodplain as much as possible to reduce the visual impacts. The Department commits to actively pursue the involvement of the National Park Service and the Illinois Department of Natural Resources as part of the project coordination concerning the Apple River.

4.16 Short-Term Use and Long-Term Productivity Relationship

Short-term environmental impacts would include air pollution resulting from emissions and dust from construction equipment. Construction equipment would also temporarily increase noise levels in the area. Water quality and ecological resources would be temporarily impacted. The removal of ground cover during construction activities could lead to erosion and sedimentation and turbidity in area streams. These impacts will be minimized by implementing erosion control techniques, as stipulated in the current *Standard Specifications for Road and Bridge Construction*.

The most evident long-term benefit of the construction of the proposed project would be improved local and regional accessibility and travel safety. Long-term economic benefits resulting from the construction of the proposed project would include increased tax revenues and employment. Initially, the removal of properties from the tax base for construction of the road would reduce tax revenues for various taxing districts. However, the improved access resulting from the construction of the proposed project would provide an opportunity for economic growth by expanding market areas and making the area more attractive to new development. New and expanded businesses would in turn create new employment opportunities.

4.17 Irreversible and Irretrievable Commitments of Resources

The land used in the construction and operation of the proposed project is considered to be an irreversible commitment during the time period that the land is used for construction and during the operational periods.

The proposed project will require the use of various types of fossil fuels, electrical energy and other resources during the construction and operation of the proposed project. The use of these resources is not expected to result in an adverse effect upon the continued availability of these resources. The proposed project will also require the commitment of various types of construction materials, including cement, aggregate, steel and asphalt (bituminous materials), electrical supplies, piping and other raw materials such as metal, stone, sand and fill material, as well as large amounts of labor and natural resources. This commitment of resources is



considered to be irretrievable. However, these resources and materials are also not in short supply, and their use will not result in any adverse effect upon their continued availability.

The construction and operation of the proposed project will also require the commitment and expenditure of county, state and federal funds which will not be available for other projects and activities. This commitment of resources is considered to be irretrievable.

The proposed project is not expected to result in any non-beneficial impacts to pristine areas, wetlands or habitats. Although the commitment of land is considered to be an irreversible commitment, it is not expected to be adverse in light of the opportunity for appropriate mitigation and the availability of suitable alternative habitats in the nearby area. The loss of agricultural land is considered to be irreversible.

Although not expected, some potential induced development in nearby adjacent areas could result that otherwise would possibly occur if the proposed project were not constructed. Though the nature of this potentially accelerated and secondary development can be controlled through the application of appropriate land use regulations, acceleration of development projects or any unanticipated or induced development that may result is, for all practical purposes, an irreversible commitment of resources (land and materials).

The commitment of resources as a result of the proposed project is based upon the concept that residents and businesses in the project area and throughout the region will benefit by improved local and regional access, the overall improvement of regional road transportation, and improvement to the transit network. These benefits are anticipated to outweigh the irretrievable and irreversible commitment of these resources.



5.0 COMMENTS AND COORDINATION

5.1 Coordination with Federal and State Agencies

The Department coordinated the project study with many local, state and federal agencies which have varying degrees of jurisdiction and expertise concerning the area's natural resources and the socio-economic outcomes of building a four-lane highway. These agencies include:

- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Illinois Historical Preservation Agency
- Illinois Department of Agriculture
- Illinois Farm Bureau
- Illinois Department of Natural Resources (formerly Department of Conservation)
- Illinois Natural History Survey
- Illinois State Geological Survey
- Illinois Environmental Protection Agency
- University of Illinois (Archaeological Survey Program)
- Federal Highway Administration
- Illinois Department of Transportation Central Office, Bureau of Design and Environment
- Illinois Department of Transportation District 2 Office, Program Development

Bimonthly coordination meetings were held between the Department, its consultants and the FHWA to discuss and analyze key issues for alternate location and to dismiss alternates that did not meet the purpose and need of the project.

During the early evaluation of the alternate alignments, the Department held two NEPA/404 meetings to refine the purpose and need of the project and to determine which alternates would be carried forward in the study.

NEPA/404 Coordination Meetings continued throughout the duration of the project. The focus of these meetings on refining the purpose and need of the project and to determine which alternates would be carried forth in the study. On April 28, 2003, each participating agency concurred with the Alternate 2 alignment (Longhollow Freeway with South Simmons Mound variation) as the Preferred Alternate.

5.2 Public Involvement

The public involvement initiative included a progressive design and an extensive application of public involvement tools. This initiative provided early and ongoing opportunities for the public, the Department, and its consultants to work in a collaborative setting. Public input resulted in major changes and adjustments to highway alignment alternates throughout the study. A blend of traditional and innovative public involvement tools was utilized to initiate and maintain an active dialogue with affected and interested citizens across the two-county region that encompassed the project.

The initial challenge in developing the public involvement initiative was how to effectively involve several thousand citizens in a project traversing over fifty miles of rural and urban area. A Work



Group/Advisory Council structure was designed where agriculture, economic development, tourism, environment, and government interests were represented. The core of public involvement activity occurred through the Work Groups/Advisory Council structure. To maintain a dialogue that would be fluid and efficient with ongoing participants, yet allow newcomers to participate, a variety of tools were used. Dialogue was facilitated through the use of kiosks, audio-video presentations, an 800 telephone number, and newsletters.

Individual Work Group Meetings were held periodically throughout the project study to discuss the findings of the engineering design and socio-economic and environmental studies being carried out by the Department and its consultants in their area of interest. Advisory Council Meetings were held when public involvement procedures or project study policy direction affected all the Work Groups.

Throughout the project study, meetings with the Department and its consultants were requested by citizens in the region. Most often these meetings were concerned with the alignment locations in relation to an individual's own property and potential impacts. Meetings with small groups of individuals and special interest groups were held also at the Department office in Dixon, Illinois, and at individual residents' homes when requested.

A U.S. Route 20 newsletter was produced periodically throughout the project study and sent to a mailing list of approximately 2,650 individuals including Work Group members. The newsletter, titled *Glacier Shadow Pass Newsletter, Public Involvement Program*, was published prior to several of the public information meetings to make the public aware of new project study data, alignment locations, Work Group and Advisory Council study progress and the outcome of issues discussion.

A 14-page U.S. Route 20 Citizen's Guide for Public Involvement, subtitled *Glacier Shadow Pass - In the Shadow of the Glacier*, was published at project study initiation. It outlined the history of four-lane highway discussion in the region, the purpose and need for a four-lane highway, engineering design and environmental impact study and proposed the Work Group and Advisory Council structure for issues and impact discussion.

The Department established an 800 toll-free telephone number, 1-800-837-RT20, so that citizens could call anytime for information on the project study. A recorded message listed upcoming meetings and contacts for specific information. Callers could also talk to a staff person regarding other more specific issues and concerns.

5.3 Public Hearing

The Federal Highway Administration began circulation of the Draft EIS on June 6, 2003. The June 6 Federal Register listed the document under the USEPA's Notice of Availability. Subsequent to the signing of the Draft EIS by the Federal Highway Administration, an open-house format public hearing was held on June 25, 2003, at Highland Community College in Freeport (Stephenson County – the east portion of the project) for the public to review the Preferred Alternate and Draft Environmental Impact Statement (DEIS). Approximately 175 people attended the Public Hearing. On June 26, 2003, a repeat of the first public hearing was held at the Galena Convention Center in Galena (Jo Daviess County – the west portion of the project). Approximately 415 people attended the Public Hearing. An audio-visual presentation was provided to outline the history of the project, to highlight study findings and give a brief overview of the final alignments and IDOT's Preferred Alternate, taking into account Work Group, Advisory



Council and general citizen input. A second audio-visual presentation was a computer rendition of what a drive on the Preferred Alternate might look like. A court reporter recorded oral public comments at the public hearings. Written public comments were accepted up to 45 days from the Notice of Availability.

A press release was sent to four newspapers – the Dubuque Telegraph, the East Dubuque Register, the Galena Gazette, and the Freeport Journal – on Friday, May 23, 2003, informing the public of the project's public hearing. The project's newsletter served as the letter of invitation and was sent to some 2,670 elected officials, media (print, radio, and TV) representatives, and the general public inviting them to the public hearing. Legal notices of the public hearings were published in the Dubuque Telegraph (Tuesday, June 10, 2003), the East Dubuque Register (Friday, May 23, 2003 and Friday, June 6, 2003), the Galena Gazette (Wednesday, May 28, 2003 and Wednesday, June 11, 2003), and the Freeport Journal (Friday, May 23, 2003 and Tuesday, June 10, 2003).

5.4 DEIS Comment Responses

Appendix A presents photocopies of the letters and comments from federal, state, and local governmental bodies, environmental/neighborhood organizations, and the general public commenting on the DEIS and/or the public hearing during the 45 day comment period. These comments are primarily on four general topics: 1) alignment concerns, 2) right-of-way concerns, 3) ecological concerns, and 4) increased truck traffic concerns and are categorized accordingly. Responses to these comments are sub grouped from the general topics as listed above into the comment key found at the end of the Breakdown of Public Hearing Comments index at the beginning of Appendix A. This format is designed to provide for consolidated response discussion addressing related comments. Comments that merely state a fact or an opinion, although helpful in refining the Preferred Alternate, do not require a specific response and are not specifically called out in this section. Comments from the Northwest Illinois Prairie Enthusiasts, the Freeway Watch Committee, the U.S. Department of the Interior, and the U.S. Environmental Protection Agency are responded to separately. Photocopies of responses made during the 45-day response period are also contained in Appendix A.

- Alignment Concerns (Comment Key No. 6)

Comment 1: The location of interchanges (Devil's Ladder, Woodbine and Lena) needs to be reevaluated.

Response 1: Due to overall cost and system benefit, the interchange suggestions have not been implemented. The selection of the Preferred Alternate, including the location of interchanges, was made involving detailed engineering studies and extensive local coordination. In particular, relocating the Devil's Ladder Interchange east to Tippet Road (approximately at the existing Galena Territory entrance) would result in a geometric design that is not as cost effective, requires more mitigation of impacted environmentally sensitive areas and does not maintain convenient access to the surrounding community. Arguably, the relocation of the interchange to the ridge-top near the main entrance to the Galena Territory serves the largest destination for the interchange more efficiently, but this advantage is not outweighed by the disadvantages. Although it is possible to design and construct an interchange at Tippet Road, it is not consistent with the avoidance approach maintained throughout the study.



Comment 2: Why wasn't an interchange at Stagecoach Trail with the Preferred Alternate considered?

Response 2: Due to the proximity to the Horseshoe Mound Interchange and the required steep grades in order to meet design criteria associated with an interchange at Stagecoach Trail, an interchange at this location was not developed.

- **Right of Way/Property Concerns (Comment Key No. 3)**

Comment 1: How are we going to be compensated for the land we will lose because of the construction of the Preferred Alternate?

Response 1: The Department will follow the Uniform Assistance and Real Property Acquisition Act of 1970 (as amended) as stated in 4.1.4 in the DEIS. As part of the land acquisition process, IDOT's policy is to pay fair market value for properties acquired. In some cases, only a portion of a parcel will be acquired. In these situations, separated parcels would remain the property of the current owner. In order to determine IDOT's "offer to purchase," an appraiser compares the market value of the original property versus the market value of the remaining parcel(s). The difference in these values is considered the fair acquisition price, since all factors that affect the value of the property to be acquired, as well as damage to the remaining property, are considered. For landlocked parcels, the Department either pays severance damages or purchases the remnant. When compensations take place, the Department is obligated to pay a just level of compensation, which will include any fair market value reduction of the remaining property. This would extend to the purchase of buildings as well as land.

Comment 2: The new highway eliminates my existing driveway, but IDOT did not provide a new driveway.

Response 2: IDOT will analyze various options to provide access to your property. You will be kept informed of the status of your concern. Access to your property will be provided in a way that the new access will be at least equal to or better than your existing access. This will be provided to you at no cost and to your satisfaction.

Comment 3: The proposed alignment of AYP Road takes too much right of way from property owners.

Response 3: The Department has investigated the configuration for the AYP Road/Cook Road intersection and has reduced the right-of-way required from the same property owners to construct this intersection from what was shown at the Public Hearing. No additional impacts have been generated. Please see Appendix A, Aerial Plan Sheets (sheet 114), and the Project Report for additional information.

- **Ecological Concerns (Comment Key No. 5, 8, 13, 17, 18, and 19)**

Comment 1: I would like to know how the increased truck traffic vehicle emissions will affect the area and the environment.

Response 1: Along with the No-Action Alternative, the Freeway and Expressway Alternates were analyzed for potential air quality impacts. The results of the modeling



for the Preferred Alternate show an inconsequential change in air quality over the No-Action Alternate. Additionally, pollutant levels are still well below National Ambient Air Quality Standards. Since the air quality modeling indicates that there will be no substantial air quality impacts, no mitigation measures are warranted to control vehicle emissions. This information is covered in the Air Quality Technical Report and summarized in the DEIS, Section 4.4. Please see Section 5.4.6, Response 9 for additional information.

Comment 2: What will prevent growth at interchanges?

Response 2: IDOT has strict policies for access along highways immediately adjacent to interchanges. Access to existing U.S. Route 20 will not be allowed within 183 to 213 meters (600 to 700 feet) of the interchange ramps. Additional controls will be placed along the first access roads on each side of the interchange. However, IDOT does not exercise power to restrict access where traffic operations and safety do not indicate such restrictions to be appropriate. IDOT also does not use access control requirements as a means to control local land use. Regulating growth at interchanges and intersections is under the jurisdiction of the county and/or municipality through zoning ordinances.

Comment 3: The DEIS does not address light pollution. Is lighting needed at the interchanges?

Response 3: An analysis of roadway lighting indicated that full interchange lighting is not warranted at any interchange location. Only partial lighting at ramp terminals and gore areas will be installed at each location. Lighting for mainline and side road bridges would also be proposed. IDOT has recently avoided using the 24.3 to 45.7-meter 80 to 150-foot high mast arm towers. Therefore, the partial lighting would consist of the 12.2-meter (40-foot) pole lighting. Full cutoff lights are a possible solution to avoid spillover of light onto adjacent areas since they are designed to direct light only to the locations where the light is needed, thus minimizing light pollution. Please see Section 4.12 for additional information.

- **Increased Truck Traffic Concerns (Comment Key No. 10)**

Comment 1: The implications of U.S. Route 20 becoming a NAFTA truck route raises a number of serious environmental concerns that have yet to be addressed.

Response 1: U.S. Route 20 is on the National Highway System, but it has not been designated as a North American Free Trade Agreement (NAFTA) Route. The Federal Highway Administration (FHWA) has researched the existence of designated NAFTA corridors, at IDOT's request, and neither the Illinois Division nor the Washington, D.C. offices of the FHWA is aware of any such designated routes. There was a reference to a bill renaming the National Corridor Planning and Development Program to the NAFTA Corridor Planning and Development Program. This was researched by FHWA as well, and no such change has been executed. Therefore, the EIS will not include any discussion concerning NAFTA other than this response.

- **Northwest Illinois Prairie Enthusiasts**

Comment 1: The DEIS fails to mention or analyze the adverse effects on public health of the fine particulate matter emitted in vehicle exhaust.



Response 1: The air quality analyses completed for this project were done so in accordance with NEPA and FHWA guidelines. The findings are presented in the Air Quality Technical Report, and are incorporated by reference in the DEIS, Section 4.4.

Specifically, the attainment status of Particulate Matter (PM₁₀) levels have been assessed in the DEIS (May 2003) page 2-29. The entire project area is designated as attainment for PM₁₀ (10 micron). The detailed PM₁₀ standards and monitored particulate pollutant levels were discussed and shown on Table 2-1 (page 2-2) and Table 3-1 (page 3-2) of the Air Quality Technical Report (March 2001). These monitored data show that the PM₁₀ levels are much lower than the National Ambient Air Quality Standards. For instance, the highest 24-hour fine particle concentration near the project area for the 1997-1999 timeframe ranged as 42 ~ 73 ug/m³ (equivalent to only 28% ~ 48% of the standard); while annual average concentrations ranged as 21.3 ug/m³ ~ 26.7 ug/m³ (only 43 % ~ 53 % of the annual standard). This is also addressed in Section 2.6 of the FEIS.

Further, section 4.4.1.3 (page 4-58) and 4.13.2 (page 4-124) of the DEIS assess and discuss fine particle emissions and dust issues related to construction, as well as the control techniques to ensure minimizing any potential emissions and impacts based on IDOT Standard Specifications and Provision for Road and Bridge Construction, Section 107.36. Consequently, the DEIS demonstrated and documented the particulate matter issues and meets the NEPA requirements.

Comment 2: Other types of noise barriers, other than a 22-foot high fence, should also be discussed.

Response 2: Acceptable noise abatement measures include those that have the potential to substantially reduce traffic-generated noise in a cost effective manner. Noise walls, if cost effective based on a cost per benefited receptor basis, are an acceptable and effective abatement measure and have therefore been included in the analysis. Please see Section 4.5 of the FEIS for other aspects of this response.

The noise analyses completed for this project were done so in accordance with NEPA and FHWA guidelines. The detailed findings are presented in the Noise Technical Report, and are incorporated by reference in the DEIS, Section 4.5.

Comment 3: The “acquisition of real property or interest therein to serve as a buffer zone” is identified in the DEIS as an appropriate way to mitigate highway noise. However, the applicability of this tool to this project is not considered.

Response 3: See Response 2.

Comment 4: What are the impacts to groundwater, if any, from karst features?

Response 4: The DEIS and FEIS, Section 2.8, acknowledges that Groundwater in karst landscapes is susceptible to contamination because of the fractured and honeycombed bedrock and the absence of a thick soil cover. The DEIS and FEIS, Section 4.6, further identifies the potential to encounter these areas during the detailed design phase of the project. Comprehensive subsurface (geotechnical) investigations are a standard scope item during the Illinois Department of Transportation’s Phase II procedure. Should the potential for groundwater risk be



identified as a result of these investigations, appropriate mitigation measure will be incorporated into the design.

Comment 5: Wetland mitigation must be located within the local watershed given the rarity of wetlands in the Driftless Area.

Response 5: NEPA states that avoidance is the first course of action in determining the location of a new project (avoid, minimize, mitigate). The alternatives included in the DEIS, and those dismissed early on (e.g. Snipe Hollow), used avoidance of environmentally sensitive areas as a priority. This avoidance approach is exemplified in the potential impacts to only 1.47 hectares (3.63 acres) of low quality wetlands (FQI ratings less than 20) along the preferred alignment. Four of the nine wetland sites potentially impacted by the preferred alignment are over an area of 0.2 hectares (0.5 acres). This is a result of combining temporary and permanent impacts together.

Mitigation of these dispersed, low quality impacts would be accomplished between a 2-to-1 and 5.5-to-1 ratio in a high quality wetland restoration area approved by the Corps of Engineers within the existing watershed of three of the impacted wetlands. Please see the second paragraph under Wetland Mitigation on page 4-32 of this FEIS for additional clarification.

Comment 6: The rationale for the mitigation wetland acres is missing.

Response 6: The rationale for mitigating wetland acres, as described in the DEIS, follows the Department's Wetland Policy Act as approved by the IDNR. (Please refer to Section 4.9.2, Wetland Mitigation, on page 4-102 of the DEIS.) State mitigation ratios are determined by the size of the impact (over or under 0.2 hectares [0.5 acres] and the mitigation site location – on-site, off-site, or out-of-basin. A mitigation ratio of 2-to-1 is for impacts less than 0.2 hectares (0.5 acres) and in-basin. A mitigation ratio of 3-to-1 is for impacts less than 0.2 hectares (0.5 acres) and out-of-basin. A mitigation ratio of 5.5-to-1 is for impacts over 0.2 hectares (0.5 acres) and out-of-basin. A total of nine wetland sites with the loss of 1.47 hectares (3.63 acres) will be affected. A total of 7.18 hectares (17.75 acres) of wetland credits will be purchased. Please see Section 4.9, Wetland Mitigation, of this FEIS for additional clarification.

Comment 7: A ratio of at least 3 to 1 (restored to impacted acres) is required, not the proposed ratio of 1 to 1.3. The ecological restoration of oak woodland habitat is the required action, not reforestation, that is, the simple planting of trees.

Response 7: Specific canopy, shrub, and herbaceous layers will be established. The goal of the restoration is to duplicate, as much as possible, the existing native upland forest plant community. Please see Section 4.6.2, Upland Forest, and Section 4.15, List of Commitments and Mitigation Measures, of this FEIS for additional clarification.

Comment 8: The mitigation for the loss of one acre of dolomite hill prairie should be the permanent protection of the remaining 13.4 acres of dolomite hill prairie within the study area. The proposed mitigation of 10.4 acres of tall mesic prairie could mitigate the loss of the other 2.9 acres [as stated in the DEIS and is actually less as noted in Section 4.6] of native grassland.



Response 8: The Department will pursue acquisition of a conservation easement for a portion of two parcels located immediately adjacent to the dolomite hill prairie that will be on the states right-of-way. The easement will be sought to protect the remaining 13.4 acres of dolomite prairie. The Department will mitigate 1.0 acres of native grassland that will be impacted. Please see Section 4.6.2, Upland Forest, of this FEIS for additional clarification.

Comment 9: Instead of stating that no wildlife corridors were identified within the project area, the statement that the entire length of the preferred alternate is rife with wildlife activity should be used. The identification of those species within the project area should be noted.

Response 9: The movement of wildlife throughout the Preferred Alternate alignment has been identified. Please see Section 4.6.2, Barriers to Movement, of this FEIS for additional clarification.

Commitments have been made by the Department on this subject and are included in the DEIS, Section 4.15.

Comment 10: Instead of stating that the project is not expected to either introduce or increase invasive/nuisance species of plants, a commitment to use only native plant materials in the construction and maintenance of this highway and to actively correct all invasive/nuisance species as the arise should be made.

Response 10: The Department has adopted practices to minimize the introduction and spread of invasive plants. Native plant materials will be used in specific locations as identified through the continuous review of this project. Please see Section 4.6.2, Invasive Species, of this FEIS for additional clarification.

Comment 11: A reference to other mitigation tools such as conservation easements, landowner incentives, design waivers, agricultural easements, buffer zones, conservation plans, cooperative agreements, scenic easements, or coordination with nongovernmental organizations should be made.

Response 11: In accordance with Department policy, the Department cannot commit to the acquisition of additional property for these purposes. However, the Department will pursue obtaining conservation easements for specific areas. Individual property owners may participate at their own discretion.

Comment 12: A formal public input process to address the numerous and varied issues relate to adverse environmental impacts that will arise during subsequent phases of the project should be formed.

Response 12: The Department has adopted the recommendation of the Advisory Council as to the continued Public Involvement during the design phases of the project. This commitment is included in the FEIS, Section 4.15.

Comment 13: Mitigation practices involving ecological restoration should be designated and implemented by a third party. IDOT has neither the expertise nor the experience necessary to successfully complete this type of work.



Response 13: Mitigation plans for the forest and prairie restoration areas will be developed by the Department. The Department's Ecologist and Landscape Architect have both the expertise and experience to successfully design and complete this mitigation. For more than 20 years, they have been working together in successfully completing the necessary compensation for wetland, prairie, and forest impacts. They will have their plans reviewed by IDNR. The Department believes that their team of experts is well qualified and will successfully complete this mitigation.

- **Freeway Watch Committee**

Comment 1: By increasing access to this area, a new freeway will induce development and thereby transform this community into a very different place. The DEIS does not present the induced impacts to changes in land use patterns, population density, and the rate of growth. This DEIS states that, "the selected alternative will function as a component of the natural landscape." No one believes that. This DEIS does not present the impacts of the socio-economic transformation.

Response 1: The comment suggests that the freeway will induce development and thereby transform the community. Construction of an access controlled freeway will limit development along the corridor to interchange locations and will therefore reduce the potential for uncontrolled development within the communities along the route.

The comment suggests the indirect impacts of alternatives were not addressed in the DEIS. Indirect and Cumulative impacts are addressed in summary form in the DEIS, Section 4.15. Specific statistical and analytical data are included in the Socioeconomic Technical Report, incorporated into the DEIS by reference.

The comment states that no one believes the selected alternative will function as a component of the natural landscape. The members of the Advisory Committees requested involvement in the design phase of the project to incorporate aesthetic features. The Department has committed to this involvement in the DEIS.

The comment suggests that the DEIS does not present the impacts of the socio-economic transformation. Socioeconomic impacts are addressed in summary form in the DEIS, Section 4.1. Specific statistical and analytical data are included in the Socioeconomic Technical Report, incorporated into the DEIS by reference.

Additionally, the Council on Environmental Quality's regulations implementing NEPA (40 CFR 1500 et seq.) require that an EIS identify all the indirect effects that are known and make a good faith effort to explain the effects that are not known but are "reasonably foreseeable" (40 CFR 1508.8(b)). If there is total uncertainty about the nature of future land use, the Department is not required to engage in speculation, but rather make an informed judgment based on reasonably foreseeable trends in the area or similar areas.

To this end, Section 4.14.2.1 of the Draft EIS contains an extensive discussion on the regional development impacts of highways, including a review of current literature on the subject. The discussion goes on to develop criteria to assess the likelihood of different types of development occurring at interchanges that would be constructed by the proposed action. Tables 4-47 and 4-48 of the Draft EIS draw conclusions about future land use at each proposed interchange



Comment 2: This DEIS does not present a no-build analysis. During its deliberations, the Route 20 Advisory Council was repeatedly advised by the Department to not even discuss a no-build option.

Response 2: The comment suggests that the DEIS does not include a No-Action Alternative. The No-Action Alternative was initially considered but was not developed further due to the lack of meeting the Purpose and Need for the project.

The comment suggests that the Advisory Councils were advised not to consider the No-Action Alternative. The build and no-build approaches were discussed initially. Upon recognition that the no-build did not meet the Purpose and Need, the balance of the time volunteered by council members was spent discussing the numerous build alternatives.

Comment 3: The DEIS uses narrowly drawn purpose and need – (1) most of existing U.S. Route 20 does not meet current design standards (a situation IDOT assume needs to be corrected) and (2) the rough terrain of Jo Daviess County prohibits construction of a new highway along the existing alignment (for which IDOT assume no design waivers should be requested) – that precludes reasonable alternatives to the proposed action.

Response 3: CEQ regulations require that an EIS “briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action” (CFR 1502.13). In Section 1 of the Draft EIS, the need for the proposed action is clearly spelled out in terms of the regional economy, highway system capacity and continuity, safety concerns and community access. The Department feels that the Draft EIS contains a thorough description of the proposed project’s purpose and need and is consistent with NEPA objectives and requirements.

Much of the existing facility does not meet current design standards. Based on capacity and safety concerns for the motoring public, the Department believes this is an undesirable situation. The terrain along the existing route is but one of the concerns with regard to construction along the existing alignment. The proximity of economic bases, environmentally sensitive areas and residential communities also makes the widening of existing U.S. Route 20 undesirable.

Comment 4: The DEIS defines the no-build alternative as “the existing local road with only normal maintenance and repair.” The No-Build Alternative does not reflect a continuation of the present course of action until such time as that action is changed. Consequently the projected impacts of build alternatives cannot be compared to the impacts for planned major improvements to the existing roadway.

Response 4: The comment stated that NEPA requires a No-Action Alternative that reflects the continuation of the present course of action. The current course of action is maintenance and short term alignment solutions that address specific deficiencies, but do not meet the needs of the corridor as a whole. This is not effective in meeting the safety and capacity elements of the Purpose and Need. The comment correctly notes, NEPA requires that a no-build analysis reflect a continuation of the present course of action until such time as that action changes. Section 3.1.1 of the Draft EIS states that implementation of the No-Action Alternative would perpetuate a



functionally obsolete facility, would not reduce congestion, would not improve traffic safety or community access and would not provide system continuity.

Comment 5: The proposed action would likely raise fine particle emissions from automobile and truck exhaust as traffic increases as a result of the proposed action and from FAP 301 (U.S. Route 20) being designated a NAFTA trade corridor.

Response 5: The air quality analyses completed for this project were done so in accordance with NEPA and FHWA guidelines. The detailed findings are presented in the Air Quality Technical Report, and are incorporated by reference in the DEIS.

Specifically, the attainment status of Particulate Matter (PM₁₀) levels have been assessed in the DEIS (May 2003) page 2-29. The entire project area is designated as attainment for PM₁₀ (10 micron). The detailed PM₁₀ standards and monitored particulate pollutant levels were discussed and shown on Table 2-1 (page 2-2) and Table 3-1 (page 3-2) of the Air Quality Technical Report (March 2001). These monitored data show that the PM₁₀ levels are much lower than the National Ambient Air Quality Standards. For instance, the highest 24-hour fine particle concentration near the project area for the 1997-1999 timeframe ranged as 42 ~ 73 ug/m³ (equivalent to only 28% ~ 48% of the standard); while annual average concentrations ranged as 21.3 ug/m³ ~ 26.7 ug/m³ (only 43 % ~ 53 % of the annual standard).

Further, section 4.4.1.3 (page 4-58) and 4.13.2 (page 4-124) of the DEIS assess and discuss fine particle emissions and dust issues related to construction, as well as the control techniques to ensure minimizing any potential emissions and impacts based on IDOT Standard Specifications and Provision for Road and Bridge Construction, Section 107.36. Consequently, the DEIS demonstrated and documented the particulate matter issues and meets the NEPA requirements.

Comment 6: The DEIS does not consider the reasonable alternative of locating this highway in the much simpler terrain of southwestern Wisconsin, does not consider a two-lane design with wide shoulders, turning lanes, passing lanes every five miles, and bypasses around the smaller towns, nor does not consider the alternative of locating a new highway on the existing U.S. Route 20 alignment.

Response 6: The comment suggests that the DEIS does not examine all reasonable alternatives. Twelve alternates were developed in detail and are included in the DEIS, Section 3.1.2. Others (e.g., Snipe Hollow) were considered throughout the course of this project (and prior to the start of this project by others) and were dismissed due to their undesirable environmental, agricultural, economic, and/or residential impacts. A far northern Illinois alternative was included in a previous study, and was dismissed. Construction of a new four-lane highway on the existing U.S. Route 20 alignment was considered and discarded. Rough terrain from Galena to Stockton prohibited constructing a new four-lane highway that would meet current design standards. Also, impacts to upland forested areas and wildlife resources (Neotropical migrant birds and timber rattlesnakes) through Tapley Woods Land and Water Reserve, an Illinois Land and Water Reserve, would have been greater than the other alternates. From Stockton eastward the use of the existing U.S. Route 20 alignment was included as part of Alternates 11 and 12. Construction of a four-lane highway within municipalities would not be possible due to the multitude of impacts. Please refer to Section 3.2 Project Alternatives Eliminated, Roadway Improvements to Existing



Alignment on page 3-14 of this FEIS for additional clarification concerning the issue of an alternate on existing alignment.

Comment 7: The DEIS does not identify all environmental preferable alternatives.

Response 7: Of the twelve alternates developed for further consideration, the preferred has the fewest overall environmental consequences.

Comment 8: The DEIS does not present consultant disclosure statements as required by NEPA.

Response 8: The Illinois Department of Transportation's Standard Agreement for Consulting Services addresses this issue. All consultants involved with The Louis Berger Group team have signed standard agreements with IDOT to complete the consulting services associated with this project.

Comment 9: The DEIS does not identify the indirect impacts resulting from U.S. Route 20 being designated a NAFTA trade corridor.

Response 9: On September 17, 2003, the Federal Highway Administration issued a letter to the Illinois Department of Transportation stating:

"The Illinois Department of Transportation has received several comments on the DEIS for the US 20 project stating that US 20 is a designated NAFTA corridor. We have researched the existence of designated NAFTA corridors and neither the Federal Highway Administration, Illinois Division, nor the Washington DC headquarters office is aware of any such designated routes.

There was also reference to a bill renaming the National Corridor Planning and Development Program to the NAFTA Corridor Planning and Development Program. We have researched this issue as well, and no such change has been executed."

Additionally, the following information clarifies some of the confusion regarding this issue:

- In June of 1998, the Transportation Equity Act for the 21st Century was enacted. TEA-21 authorizes the Federal surface transportation programs for highways, highway safety, and transit.
- Federal Highway Administration discretionary funds have been provided to individual states as part of the National Corridor Planning and Development and the Coordinated Border Infrastructure programs. These programs, informally known jointly as the Corridors and Borders program, were provided for by the TEA-21.
- There is current legislation pending in the United States Congress that would rename the National Corridor Planning and Development Program, the NAFTA Corridor Planning and Development Program. Regardless of title, U.S. Route 20 has not been designated as one of these corridors.
- The Corridors and Borders program funds projects in 44 Congressional High Priority Corridors based on factors specified in TEA-21. The Borders program is designed to improve border transportation infrastructure and operations that facilitate the safe movement of people and goods at or near the U.S.-Canada and the U.S.-Mexico borders.



The Federal Highway Administration has not designated the U.S. Route 20 Corridor as a Congressional High Priority Corridor and therefore study and discussion in the Draft Environmental Impact Statement is unwarranted.

Comment 10: The DEIS does not consider all relevant, reasonable measures to avoid or reduce impacts of the proposed action, including remedies outside the jurisdiction of the acting agency – such as design waivers.

Response 10: The comment suggests that design waivers may be a reasonable way for the preferred alignment to reduce or avoid adverse impacts. The state of Illinois Department of Transportation has avoided and/or minimized environmental impacts without the need to compromise capacity and/or design by requiring design waivers. The potential for further reduction in adverse impacts may be considered during the design phase of the project.

Comment 11: The DEIS states, “At this time, there are no known local or agency-related subjects of controversy or unresolved issues associated with the proposed project”. To the contrary, active and ongoing opposition to the construction of a freeway in Jo Daviess County has existed for over a decade. The Freeway Watch Committee (FWC) has to this day remained a strong advocate for a safe, economical expressway, constructed substantially on the existing U.S. Route 20 alignment. FWC is dedicated to continuing an open and comprehensive discussion of the issues surrounding this project until they can be fairly resolved.

Response 11: The comment suggests that the DEIS misrepresented known local or agency related subjects of controversy or unresolved issues associated with the project. At the time of DEIS publication, opposition groups, that had organized early on in the public involvement process, had not actively participated in any public meeting or advisory council meeting in a number of years. Many of the original Freeway Watch Committee members had become involved with the Advisory Council process and had since given their support to the project. Additionally, many of the committee’s members became less involved as potential alignments were eliminated from consideration and their properties were no longer impacted. As indicated by the addressing of issues raised in the committee’s letter and over 200 comments received during the Public Hearing process, the Illinois Department of Transportation is dedicated to the continuing and comprehensive discussion of issues surrounding the project. The Department will continue to listen to the concerns of the residents of the project area, whether in support or opposition of the proposed improvement.

Comment 12: The accident data presented in the DEIS are outdated and incomplete.

Response 12: The comment suggests that the analysis of crashes within the corridor is lacking due to the absence of additional data. The Department has reviewed the additional data omitted in the DEIS and has determined that the statements included in the DEIS are accurate. Additional trend data is included in the Final EIS to address this concern further, please see Section 1.3.

- U.S. Department of the Interior

Comment 1: The DEIS fails to discuss the magnitude of impact to outstanding remarkable values (ORV’s) that would be associated with additional crossings of the



Apple River. We recommend that the Final EIS include an evaluation of direct, indirect, and cumulative impacts to the ORV's associated with the proposed bridge crossings.

Response 1: The DEIS includes a brief discussion of the potential for impacts to ORVs of the NRI candidates; however, it is not possible beyond a commitment to detail impacts or quantify the magnitude of impacts at this point of the design. The Design Report includes bridge sketches of river crossings; however, they lack the design development necessary to provide a detailed mitigation measurement. The Department is committed to minimizing impacts and continues to include this statement in the FEIS document.

Comment 2: Please include measures to minimize impacts to the free flowing condition, scenic, and recreational resources of the Apple River. We recommend minimizing removal of riparian trees and vegetation within the National Rivers Inventory stream corridor; the incorporation of design features, such as the use of naturally tinted concrete piers and abutments for any bridge work to minimize visual intrusions; and the use of native plantings along the stream bank corridor. If deemed necessary, we suggest the use of native rock materials and other "soft" hardening techniques, rather than the use of rock rip-rap. We also recommend that consideration be given to moving the bridge (Apple River) crossings approximately 100 feet to the northeast and orienting the crossings as closely as possible to perpendicular to the river if such a modification would still allow the highway to meet design standards while reducing the potential need to have any of the bridge piers in the waterway.

Response 2: The FEIS includes commitments to minimize impacts to NRI candidates, including the conditions and items referenced. Aesthetic treatments will be incorporated as possible, as committed to by acceptance and adoption of the Advisory Council's recommendation.

Comment 3: We recommend that the last two sentences of the second paragraph of subsection 2.8.1.6 be removed or revised to indicate that washoff could affect groundwater supplies and to make this paragraph consistent with the one on page 2-53. The same discussion of "sources" occurs in the first full paragraph on page 4-78 and should be similarly modified.

Response 3: The text previously included in Section 2.8.1.6 is deleted in the FEIS.

- **U.S. Environmental Protection Agency**

Comment 1: The DEIS does not quantify the acreage of karst areas affected by each build alternative; therefore it is not possible to compare the alternatives on this issue. The FEIS should indicate the acreage of karst topography associated with each build alternative.

Response 1: Additional text on this topic has been added to the FEIS. Please see Sections 2.8 and 4.6 referring to Karst.

Comment 2: The DEIS does not describe special design considerations if karst features are encountered that are referred to in the DEIS. The FEIS should include a detailed description of the special design considerations planned for karst areas.



Response 2: Additional text on this topic has been added to the FEIS. Please see Section 4.6 referring to Land Subsidence and Landslides.

Comment 3: The DEIS does not include information about state, county, or local regulations (e.g., zoning or land use plans) which would protect karst area from wastewater contamination. The project proponents should conduct an assessment of this information, consider it prior to selecting an alternative, and include the assessment in the FEIS.

Response 3: Research on the subject did not yield any state, county or local regulation regarding the protection of karst areas with regard to the specific proposed improvements.

Comment 4: The Galena River is a waterbody in the study area listed as an impaired stream under Section 303(d) of the Clean Water Act. The DEIS states that potential sources of its impairment are agriculture, urban runoff/storm sewers, channelization and unknown sources. Under Section 303 (d), impaired streams are subject to Total Maximum Daily Load (TMDL) program, which is used to return the streams to compliance with water quality standards. It is not clear how indirect impacts from the proposed project (e.g., increased stormwater flow rates) would affect the TMDL program goals for the Galena River. The FEIS should provide this information and describe mitigation commitments to reduce these impacts.

Response 4: TMDL commitments are included in the FEIS, Section 2.9.

Comment 5: The DEIS addresses fragmentation impacts to Neotropical migrants and efforts to reduce these impacts. However, the DEIS does not address direct impacts to Neotropical migrants from forest removal. Direct ecological impacts to Neotropical migrants throughout the forest should be explored in greater depth in the FEIS. The project proponents should provide the nesting season dates for the Neotropical migrants in the project area and commit to avoid disturbing these birds' habitat during this time.

Response 5: A commitment to limiting construction activities to non migratory seasons is included in the FEIS, Section 4.15.

Comment 6: According to the DEIS, the project proponents would mitigate forest impacts by purchasing 209.85 acres for reforestation. This compensation acreage is less than the 273.5 acres impacted by the preferred alternate. The purchase of land with established trees does not compensate for trees removed due to the project. Therefore, the mitigation section of the FEIS should commit the project proponents to plant trees in an area which equals the area of trees removed under the Preferred Alternate.

Response 6: The Department continues to identify additional candidate parcels for acquisition (land locked, adjacent to forested areas, etc.) to meet the required minimum mitigation ratios for tree replacement. A commitment to an increased ratio is included in the FEIS, Section 4.15.



6.0 LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT WERE PROVIDED

6.1 Federal Agencies

U.S. Department of Agriculture, Natural Resource Conservation Service – State Conservationist
U.S. Department of Agriculture, Natural Resource Conservation Service – Local Field Office
U.S. Department of Defense – Army Corps of Engineers
U.S. Department of the Interior – U.S. Fish and Wildlife Service
U.S. Department of the Interior – Office of Environmental Policy and Compliance
U.S. Environmental Protection Agency

6.2 State Agencies

Department of Agriculture
Department of Natural Resources
Department of Public Health
Environmental Protection Agency
Historic Preservation Agency
Illinois State Clearinghouse
Illinois State Library

6.3 Local Agencies

City of Freeport
City of Galena
Village of Elizabeth
Village of Lena
Village of Stockton
Jo Daviess County Board
Stephenson County Board

6.4 Agricultural Agencies

Illinois Farm Bureau
Jo Daviess County Farm Bureau
Jo Daviess County Soil and Water Conservation District
Stephenson County Farm Bureau
Stephenson County Soil and Water Conservation District

6.5 Organizations and Institutions

Freeway Watch Committee
JD/S Four-Lane 20 Association
Galena Territories Homeowners Association



Elizabeth Library
Freeport Library
Galena Library
Stockton Library
U.S. Route 20 Advisory Council



7.0 LIST OF PREPARERS

The persons listed below were responsible for the preparation and review of this Draft Environmental Impact Statement, technical reports, and background studies relevant thereto.

7.1 Federal Highway Administration (FHWA)

<u>Name</u>	<u>Qualifications</u>	<u>Primary Responsibilities</u>
Traci Baker	Civil Rights Specialist	FHWA Review
Jason Cowin	Engineering Team Leader	FHWA Review
Chris Fraley	Transportation Engineer	FHWA Review
Don Keith	Right-of-Way Manager	FHWA Review
Arlene Kocher	Transportation Engineer	FHWA Review
J.D. Stevenson	Environmental Programs Engineer	FHWA Review

7.2 Illinois Department of Transportation (Department)

<u>Name</u>	<u>Qualifications</u>	<u>Primary Responsibilities</u>
Steven Gobelman	M.S., Geological Engineering B.S., Geological Engineering P.E., Illinois, Missouri P.G., Kentucky IDOT, 1993 to present	Special Waste Review
Jon M. McCormick	M.S., Civil Engineering; B.S. Civil Engineering; P.E. Illinois; I.D.O.T. 2001 to present; 16 years of prior experience in design and planning of transportation and general civil engineering projects	District Project Coordinator; Coordination and general content review.
Kevin F. Marchek	B.S. in Civil Engineering; P.E. Illinois; 22 years of experience at I.D.O.T.	Studies & Plans Engineer
William R. McWethy	B.S. Civil Engineering; P.E. Illinois; 25 years experience at I.D.O.T. in Design, Construction & Hydraulics	District Hydraulics Engineer



Charles Perino	Ph.D., Plant Taxonomy M.S., Plant Taxonomy B.S., Geology IDOT, 1982 to present 10 years prior biological/environmental experience	General Content and Coordination; Natural Resources Review
Cassandra S. Rodgers	Ph.D. Biology (Ecology); M.S. Biology (Ecology); B.S. Biology; I.D.O.T. 1984 to Present; 8 years prior experience in ecological research	Wetlands Analysis, Review
Geoff F. Smith	B.S. in Civil Engineering; P.E. Illinois; 19 years of experience at I.D.O.T. in Design and Construction	In charge of Project Studies Unit
Barabara H. Stevens	M.A., Economics IDOT, 1979 to present	Socioeconomic Impact Analysis and Review
John A. Walthall	Ph.D., Archaeology M.A., Anthropology B.A., Anthropology IDOT, 1978 to present 12 years prior archaeological experience	Archaeological Coordination, Analysis, and Review
Patrick F. Warkins	B.S. in Civil Engineering; P.E. Illinois; 25 years experience at I.D.O.T.	Geometric Review
Walter Zyznieuski	M.A., Environmental Studies IDOT, 1994 to present 14 years prior environmental experience	Air Quality Coordination Analysis and Review



7.3 Consultants

The Louis Berger Group, Inc. Chicago, Illinois

<u>Name</u>	<u>Qualifications</u>	<u>Primary Responsibilities</u>
Thomas P. DiChiara, AICP, P.P.	M.C.R.P., City and Regional Planning/Urban Design, Catholic University B.A., Geology/Environmental Sciences, Rutgers University	Environmental Lead/Overall DEIS/FEIS, Environmental Technical Reports, Public Involvement and Coordination
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Daniel J. Loftus, P.E.	B.S., Civil Engineering, Marquette University	Project Engineer, Purpose and Need, Project Description, Project Coordinator
Edward Samanns	M.S., Geography, Rutgers University B.S., Biology, Slippery Rock University	Biological Resources, Wildlife, Wetlands
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Jillian McColgan, B.L.A.	BL.A., Landscape Architecture, University of Toronto	Visual Resources



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<u>Name</u>	<u>Qualifications</u>	<u>Primary Responsibilities</u>
Paul Biggers, P.E.	M.S., Botany, Southern Illinois University B.S., Civil Engineering University of Illinois B.S., Zoology, Southern Illinois University	Public Involvement, Comments and Coordination
Sue Laue	M.S., Media Management, Northwestern University, Medill School of Journalism M.S., Agriculture (Soils), University of Kentucky, School of Agriculture B.S., Sociology/Journalism, Illinois State University	Public Involvement, Comments and Coordination



8.0 REFERENCES

The following is a listing of the reference materials and documents used in the preparation of the FEIS. This is in addition to the references used in the preparation of the DEIS and listed in Section 8.0 of the DEIS. Further detail regarding reference materials, maps and other source data used in the preparation of the DEIS and FEIS are provided in the individual technical studies, which have been prepared separate to the DEIS and this FEIS.

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APPENDIX A



PUBLIC HEARING DOCUMENTATION



RESOURCE AGENCY COORDINATION



AD-1006 FORMS



NEPA/404 MERGER MEETING MINUTES



MUNICIPALITY RESOLUTIONS



DRAFT SECTION 404 (b)(1) EVALUATION REPORT



AERIAL PLAN SHEETS
