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## FINAL PROJECT CONCEPT STATEMENT

U.S. 30, Eastbound Bridge over Cedar River,  
0.5 miles west of the east junction of U.S. 151.

Linn County  
BRF-030-7(182)--38-57  
PIN: 14-57-030-020  
Maint. No.5758.9R030  
FHWA No. 33470

Highway Division  
Office of Design

Kevin K. Patel, P.E.  
515-239-1540

February 22, 2016

### I. STUDY AREA

#### A. Project Description

This project involves the replacement of the U.S. 30, eastbound bridge over the Cedar River (Maint No.5758.9R030) 0.5 miles west of the east junction of U.S. 151.

The existing bridge will be replaced with a 1,134' x 40' pretensioned prestressed concrete beam bridge. Traffic will be maintained via median crossovers with a temporary lane separator system allowing right in/right out movements at all accesses between the crossovers. Total cost for this project is estimated at \$8,466,200.

#### B. Need for Project

The bridge is classified as functionally obsolete due to the inadequate width. The deck, deck overlay, superstructure and substructure are all at the end of their service life and deteriorations are found in all the structural components and approaches. The structure was designed for H20 load and needs to be strengthened to HS20. The bridge widening in conjunction with bridge strengthening and bridge repair would not be cost effective. In addition, the two-girder bridge is fracture critical. Therefore, the bridge should be replaced.



Looking east at the bridge.



Looking west from west end of bridge.



South side of eastbound bridge.



Looking west at the bridge.

#### C. Present Facility

This is a 1,134' x 29' steel bridge which was constructed in 1953 and overlaid in 1974 and 1990.

The eastbound bridge has been determined eligible for the National Register of historic places. This bridge was the first of its type in the state of Iowa and as such it was determined eligible for the National Register of Historic places in the 2011 statewide bridge study (Baynard et al. 2011). This bridge is a Section 4(f) resource.

U.S. 30 in the project area is 24 ft. wide PCC pavement with 6 ft. wide inside and 10 ft. wide outside granular shoulders and 6:1 foreslopes, constructed in 1953. HMA resurfacing was accomplished in 1979 and 1994.

#### D. Traffic Estimates

The 2020 and 2040 average daily traffic estimates are 27,700 ADT with 14% trucks and 39,800 ADT with 16% trucks, respectively.

E. Sufficiency Ratings

U.S. 30 is classified as a commercial and industrial route and is a maintenance service level "B" road. The federal bridge sufficiency rating is 63.3.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2010 through December 31, 2014, there were two personal property damage only crashes that involved the eastbound bridge.

## II. PROJECT CONCEPT

A. Feasible Alternative - Replace with a bridge

The existing 1,134' x 28' steel bridge will be replaced with an 1,134' x 40' pretensioned prestressed concrete beam bridge. The bridge will be staged constructed utilizing median crossovers to minimize disruption to traffic (refer to construction sequence on page 5)

The typical cross section adjacent to the bridge will consist of a 24 ft. wide roadway (26 ft. wide pavement) with 10 ft. effective outside shoulders (2 ft. outside pavement, 4 ft. additional paved and 4 ft. granular) and 6 ft. wide effective inside shoulders (4 ft. paved and 2 ft. granular).

This bridge will be constructed on the existing vertical and horizontal alignment. Construct new bridge approaches. Replace the existing guardrail and bullnose for both bridges with new guardrail and pave the shoulders 20 ft. beyond the ends of the guardrail. Class 10 will be required to construct the new guardrail blisters. This grading will transition to the existing foreslopes which will be used as constructed. Place class E revetment for slope protection under the bridge. Construct two bridge end drains on each end of the bridge.

The eastbound lanes will be closed and traffic will be maintained on the westbound lanes via the use of median crossovers. The lanes will be separated by the temporary lane separator system prohibiting left turn movements. J-turn maneuvers will be allowed at the Jappa Road and Knapp Road intersections. The outside shoulder of the

eastbound lanes of U.S. 30 and east of Jappa Road is paved and will accommodate the J-turn movements as constructed. The outside shoulder of westbound U.S. 30 at Knapp Road will need to be paved 10 ft. wide for approximately 250 ft. west from Knapp Road.

Before traffic is switched to the westbound lanes and the construction of the new bridge can begin, some modifications will need to be completed at the intersection of Old River Road. These modifications include: a right turn lane for the eastbound traffic turning onto Old River Road, the outside shoulder of the westbound lanes will need to be paved full depth between the intersection of Old River Road and the bridge to allow for an extra lane of traffic, and the existing left turn lane for the U.S. 30 westbound to Old River Road southbound will now become an acceleration lane for east bound traffic to enter U.S. 30. This lane will be extended as far as possible without impacting the existing guardrail. It is recommended that this work and the crossover construction be completed in the year prior to the bridge reconstruction.

Topsoil will be stripped, salvaged and replaced. Apply erosion control and rural seeding and fertilizing to all disturbed areas. The clearing and grubbing of one tree appears to be required and may also be completed the preceding year.

It appears that no right of way will be required for this project.

<b>Bridge Items</b>	<u>Estimated Costs</u>
Bridge Superstructure	\$3,171,000
Bridge Piers	1,554,000
Bridge Removal	581,400
Erosion Stone	700
Revetment	42,000
Causeways	345,000
Mobilization - 10%	569,400
M & C - 15%	<u>939,500</u>
<b>Bridge Costs</b>	<b>\$ 7,203,000</b>

<b>Roadway Items</b>	
Bridge Approaches	\$84,800
Excavation Class 13 Waste	1,400
Guardrail (Includes Removal)	43,600
Paved Shoulders for Guardrail	21,000
Class 10 for Guardrail Blisters	21,800
Bridge End Drains	3,000
Strip, Salvage and Spread Topsoil	15,300
Clearing and Grubbing	2,300
Temporary Lane Separator System	39,600
Temporary Floodlighting	8,100
Median Crossovers	270,000

Construction of Turn Lanes	110,400
Erosion Control	100,000
Wetland Mitigation	50,000
Intelligent Work Zone	112,000
Traffic Control - 5%	44,200
Mobilization - 5%	<u>44,200</u>
Sub-Total	\$971,700
M & C - 30%	<u>291,500</u>
<b>Roadway costs</b>	<b>\$ 1,263,200</b>
<b>Project Total</b>	<b>\$8,466,200</b>

B. Detour Analysis

There will be no off-site detour. Traffic will be maintained with two lane, two way traffic on the westbound lanes via the use of median crossovers.

C. Recommendations

It is recommended that the present structure be reconstructed, as described above.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Office of Bridges and Structures will coordinate the plan preparation with assistance from the Office of Design. It was recommended to schedule the letting date to allow for the median crossovers and pavement work to be completed the preceding year. The bridge construction will be staged as follows:

Stage 1.

Traffic will be maintained in its current configuration. Install the drilled shafts on the out sides of the existing eastbound bridge.

Stage 2.

Eastbound traffic will be shifted to the westbound lanes for two lane two way operations via the use of median crossovers. Remove the eastbound bridge and construct the new bridge pier caps, beams and decking.

Stage 3.

Return traffic to normal operations and remove the median crossovers.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to U.S. 30; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

This project should be considered a Traffic Critical project and a candidate for an Intelligent Work Zone project.

No bike path or sidewalk will be required as part of this project.

Right of Way will not be required for this project.

The Office of Location and Environment has reviewed this project and the project will require a 404 Permit due to the work in the water. The Cedar River is identified by the DNR as a Meandered Sovereign River, which will require a separate permit.

During the field review, the channel substrate near the bridge appeared to be clean and potentially viable for using as fill as part of the EW-401. There does not appear to be any known mussel beds or records, riffles etc. near the bridge. When the soil samples are completed, the Office of Location and Environment should be notified of the results of the material and if the material is suitable, we will then include a request for dredging in the channel with the 404 Permit Application.

A review of the United States Fish and Wildlife Service (USFWS) list of federally-listed species as well as the Iowa Department of Natural Resource's (DNR) Natural Areas Inventory was conducted to determine the likelihood of the proposed project impacting threatened and/or endangered species. A 2002 documented occurrence of the state endangered Pistolgrip (*Tritogonia verrucosa*) is known approximately 900 feet downstream of the Highway 30 Bridge over the Cedar River. Additionally, occurrences of the state endangered lake sturgeon (*Acipenser fulvescens*) and state threatened western sand darter (*Ammocrypta clara*) are documented further downstream. Coordination with the Iowa DNR will be initiated and a mussel survey and relocation may be required.

The project does not fall within a county designated by the Iowa DNR and the USFWS as summer range of the Indiana bat (*Myotis sodalis*) in Iowa and suitable habitat for the Northern long-eared bat (*Myotis septentrionalis*) is not present. The project does not fall within a county designated by the USFWS as Topeka shiner (*Notropis topeka*)



range. Woodland, per Iowa Code 314.23, will not be impacted. Per standard specification 2101.01A cutting of trees 3 inches (75 mm) or more in diameter shall be completed between October 1st and March 31st.

The Office of Location and Environment have not completed archaeological survey along this stretch of US 30; however, there are a number of previously recorded archaeological sites located in this proximity. Their assessment of the soil packages in this area is that there is a high potential for, yet to be recorded archaeological sites. Should any ROW be needed (permanent and temporary) a phase I archaeological survey will be required.

G. Program Status

Site data has been developed by the Office of Design. This project is not listed in the 2016-2020 Iowa Transportation Improvement Program. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

KKP: jmb

# LINN COUNTY

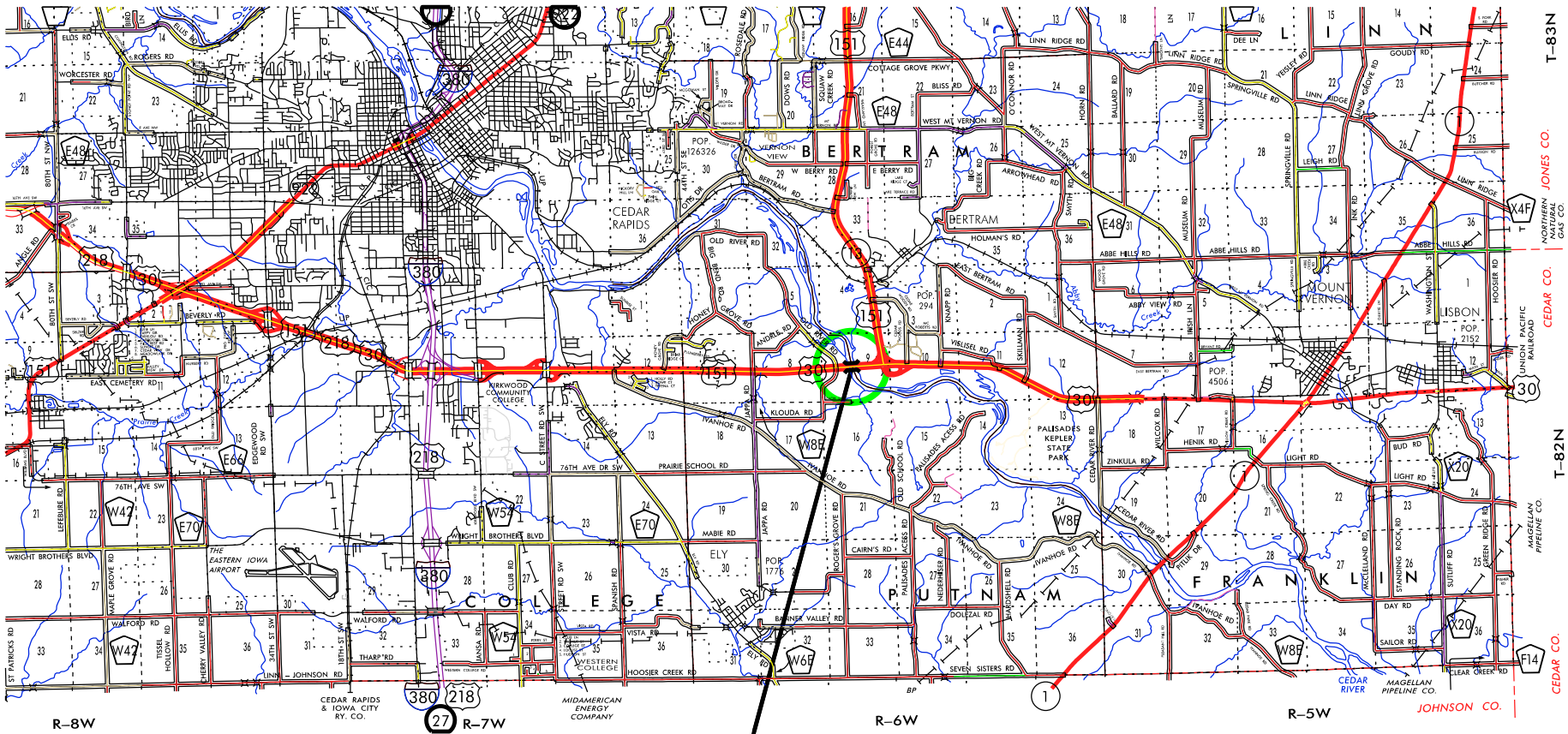
U.S. 30 EB CEDAR RIVER BRIDGE

0.5 MILES WEST OF THE EAST

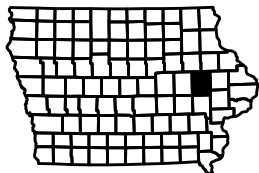
JUNCTION OF U.S. 151 (EB)

BRF-030-7(182)-38-57

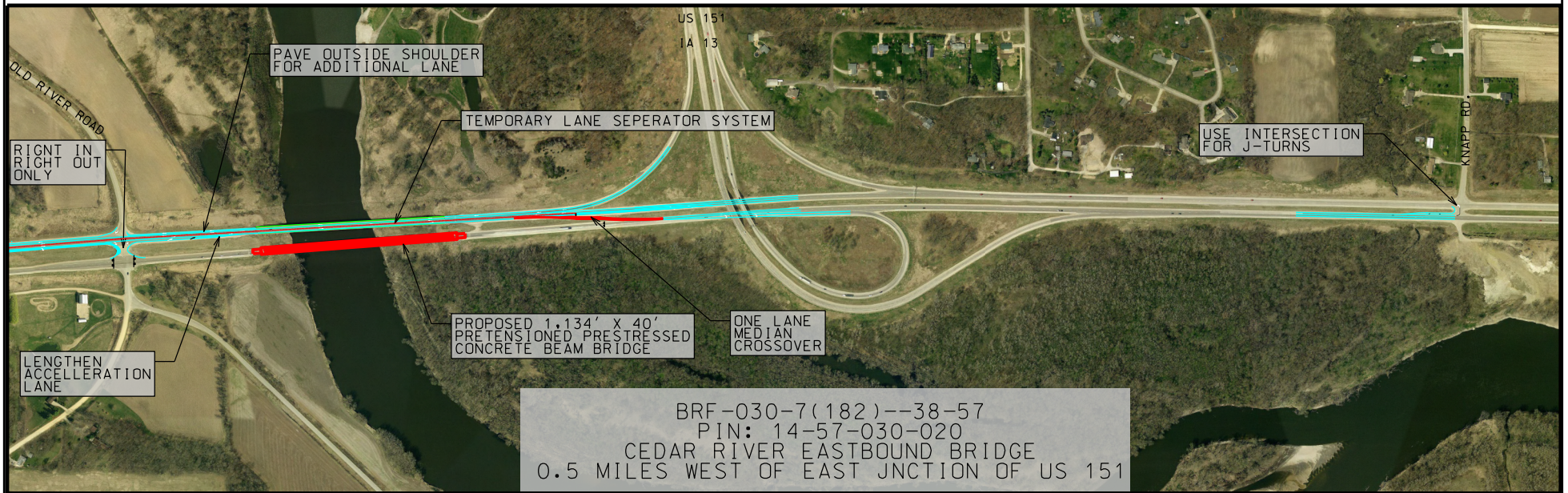
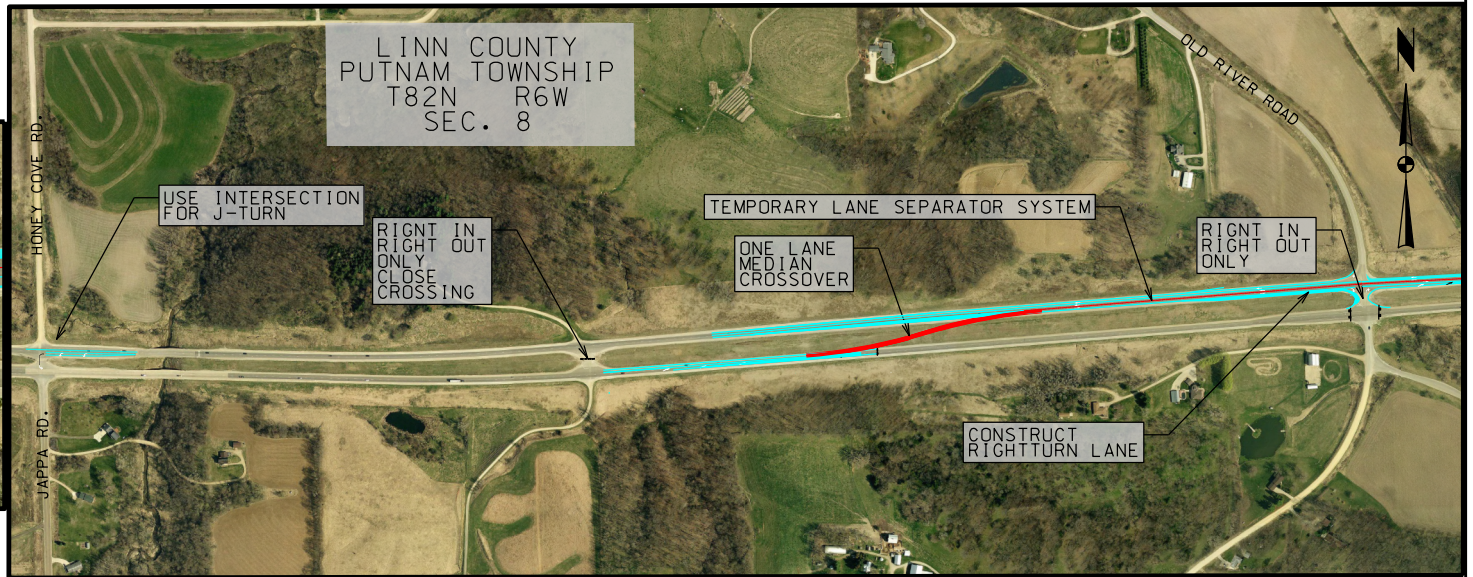
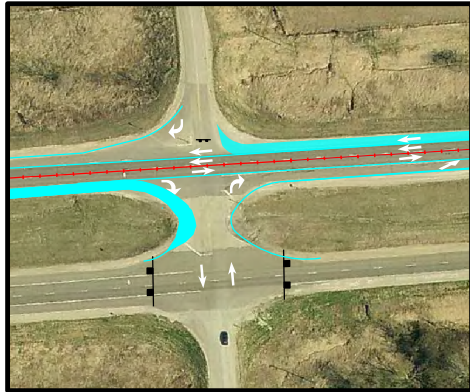
PIN: 14-57-030-020



**STA 387+82**  
**FHWA 33470**  
**MAINT. No. 5758.9R030**  
**DESIGN 151**



INTERSECTION WITH OLD RIVER ROAD



ROAD DESIGN	• CADD • PRODUCED	STATE OF IOWA	FHWA REGION 7	FISCAL YEAR	LINN COUNTY	PROJECT NUMBER	BRF-030-7(182)--38-57	SHEET NUMBER	1
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