

IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE: District 5
ATTENTION: Bob Younie
FROM: John Bartholomew
BUREAU: Design
SUBJECT: 2026 - NR Project Concept - **FINAL**

DATE: November 21, 2024
PROJECT: Mahaska County
NHSX-063-3(108)--3H-62
PIN: 25-62-063-010

MEETING: June 19, 2024

PARTICIPANTS: District 5 – Bob Younie and Steve McElmeel; Design – Kevin Patel, Mark Dell, Mike Kennerly, Grace Immel, David Heer, Masrur Mahedi, Trevor Rhedin, Eric Fagre, Cameron Hershey and Greg Moyle.

DATE OF REVIEW – **Meeting on Microsoft Teams:** September 10, 2024

PARTICIPANTS: Design - John Bartholomew, Hollie Richey, Kevin Patel, Mike Kennerly, Mark Dell, Grace Immel, Eric Fagre and Cameron Hershey.

This project involves the reconstruction of U.S. 63 at various locations using double reinforced pavement to minimize future pavement and shoulder subsidence as a result of underground mines.

There is only one alternative for this project. Reconstruct mainline at various locations with head to head traffic, utilizing staging and crossovers. The estimated cost of this project is **\$7,799,800.**

PROJECT DATA:

ROUTE: U.S. 63

From: North of County Road G63 to south of 293rd St. – various locations

Project location adjusted: North of County Road G63 to south of 290th St.

LENGTH: 1.16 miles (approx. M.P. 57.73 to approx. M.P. 58.89)

PLANNING CLASSIFICATION: Commercial and Industrial

MAINTENANCE SERVICE LEVEL: B

TRAFFIC: 2023 --- 12,700 ADT with 19% trucks

PRESENT PAVEMENT SURFACE: NB Lanes - PCC and PCC with HMA, SB Lanes - PCC

PRESENT SHOULDER WIDTH:

NB Lanes – 6 ft. inside paved and 8 ft. outside (4 ft. paved and 4 ft. granular)

SB Lanes – 6 ft. inside paved and 10 ft. outside (4 ft. paved and 6 ft. granular)

Google Earth shows HMA shoulders for northbound and southbound lanes. 7/2018 imagery (NB) and 9/2024 imagery (SB). The as-builts don't reflect the paved shoulders as shown in Google Earth.

M.P. to M.P.	Dir.	Type	Avg. Str. No.	80% Str. No.	Jt. Str. No.	PCI	IRI	K Value
55.59 to 57.94	1	1	7	6	---	53	165	167
57.94 to 58.92	1	3	8	6	---	68	145	198
56.79 to 60.33	2	1	7	5	---	57	157	150

PAVEMENT HISTORY:

NORTHBOUND LANES

M.P. 55.59 to 57.94

ORIGINAL PAVEMENT: 24 ft. wide, 10 in. PCC

COARSE AGGREGATE SOURCE: Sully Mine

YEAR CONSTRUCTED: 1997

M.P. 57.94 to 58.92

ORIGINAL PAVEMENT: 22 ft. wide, 8 in. PC8

COARSE AGGREGATE SOURCE: Eddyville

YEAR CONSTRUCTED: 1949

RESURFACED AND WIDENED: 1995, 2 in., 24 ft. wide surface AAC with 4.5 base AAC, 6 - 7 ft. future inside granular and 7 to 10 ft. variable granular outside shoulder

SOUTHBOUND LANES

M.P. 56.79 to 60.33

ORIGINAL PAVEMENT: 26 ft. wide, 10 in. PCC

COARSE AGGREGATE SOURCE: Sully

YEAR CONSTRUCTED: 1998

EXISTING CONDITIONS AND CAUSES OF DISTRESS:

The northbound lanes were constructed in 1949 using 8 in. of PC8 PCC. Widening and resurfacing of 6.5 in. AAC occurred in 1995. The roadway was expanded from a 2 lane to 4 lane facility in 1998 with the addition of the southbound lanes. The southbound lanes were constructed using 10 in. PCC on variable thickness granular subbase (10 in. thick on centerline). This section of U.S. 63 had known underground and surface mines in this area and as a result of this has experienced 4 subsidence events. Three of these subsidence events can be classified as sags, while the other event was a 6 ft. diameter sinkhole, approximately 30 ft. - 40 ft. deep. An additional sinkhole opened up in the landfill area adjacent to the project site.

The southern most sag in the southbound lanes at M.P. 57.75 was address by an HMA overlay. The sag featured at M.P. 58.65 of the southbound lanes was addressed by backfilling the mine voids under the roadway with a water/sand injection along with pavement replacement. A sag occurred on the northbound lanes at M.P. 58.85 which was addressed with an HMA overlay. The sinkhole that developed located at M.P. 58.2 of the southbound lanes was approximately 6 ft. in diameter and 30 ft. - 40 ft. deep and was filled by aggregate. This project is to use double reinforced pavement to minimize future pavement and shoulder subsidence as a result of these underground mines. The pavement limits were based upon information recommended by Marino Engineering Associates, a specialty subsidence and mining engineering consultant hired by the Iowa DOT, as well as Lidar pavement scans, in addition to in-house electrical resistivity testing.

SAFETY CONSIDERATION:

Crash History

During the five-year study period from January 1, 2019 through December 31, 2023, there were 11 crashes including, 3 personal injury crashes, and 8 personal property crashes. The intersection within this segment of U.S. 63 is currently listed as a negligible PCR level intersection with a 0.01 PCR value.

ALTERNATIVE 1 RECONSTRUCTION – Reconstruct mainline with head to head traffic with crossovers

This project is at various locations of the northbound and southbound lanes on U.S. 63, from approximately 0.65 miles north of County Road G71/G63 (approx. M.P. 57.73) to 0.20 miles south of 290th St. (approx. M.P. 58.89), a distance of approximately 1.16 miles. This roadway is a 4-lane divided highway with 6 ft. inside and 10 ft. outside shoulders and a 50 ft. median.

The existing mainline pavement and paved shoulders will be removed. The new roadway typical section will be a 40 ft. wide PCC pavement (6 ft. inside shoulder, two 12 ft. lanes and 10 ft. outside shoulder) section, consisting of 12 inches of double reinforced PCC pavement on 12 inches of modified subbase. New longitudinal subdrains and outlets will be installed.

Construction will take place within the following station limits:

1294+00 to 1297+00
1316+50 to 1323+50
1328+00 to 1339+00
1342+00 to 1345+00
1353+50 to 1355+00

Stage 1 will be constructed using staged construction. Stages 2 and 3 will utilize median crossovers. The crossovers will be constructed north of County Road G63/310th St. (approximate M.P. 57.2) and north of 290th St. (approximate M.P. 59.45). The crossovers will be left in place at the completion of this project. During construction it will be necessary to place temporary crash cushions on the trailing corners of the northbound bridge to accommodate the two lane, two way traffic.

Stage 1A: Construction of the right lane of northbound U.S. 63, Sta. 1353+50 to 1355+00 utilizing staged construction.

Stage 1B: Construction of the left lane of northbound U.S. 63, Sta. 1353+50 to 1355+00 utilizing staged construction.

Stage 2: Construction of southbound lanes of U.S. 63, utilizing crossovers.

Stage 3: Construction of the remainder of the northbound lanes of U.S. 63, utilizing crossovers.

Rumble strips will be ground into both inside and outside shoulders.

Right of way is not required.

ESTIMATED COST:

<u>Item</u>	<u>Estimated Cost</u>
Double Reinforced PCC Pavement 12 inch	\$3,853,500
Removal of Pavement	194,500
Modified Subbase	650,500
Shoulder Construction, Earth	55,800
Crossovers	727,800
Pavement Markings, Multi-component	7,200
Excavation, Class 13 Waste	216,200
Longitudinal Subdrains (Includes Outlets)	119,300
Temporary Crash Cushions	2,700
Rumble Strips	11,600
Temporary Barrier Rail	10,700
Traffic Control (5%)	390,000
Mobilization (5%)	390,000
M & C (15%)	<u>1,170,000</u>
Total Alternative No. 1	\$7,799,800

RECOMMENDATIONS:

The recommended method of rehabilitation for this project is reconstructing mainline pavement and shoulders in various locations. The estimated cost of this project is **\$7,799,800.**

Right of way is not required.

The Water Resources section of the Location and Environment Bureau stated that this project may need a 404 permit if culvert work or clearing and grubbing will be done within a regulated waterbody. Depending on the extent of work, mitigation could be required.

SPECIAL CONSIDERATIONS

Traffic volumes during construction are not expected to be high enough to require special construction scheduling.

This will not be a traffic critical project.

This area will need to be monitored due to a history of settlement issues due to the underground mines and soil conditions.

FUNDS PROGRAMMED:

This proposed NR project is not yet in the 2025-2029 program. It has been identified by the District 5 office for construction in FY 2026. A schedule of events for plan development will be determined following approval of the Project Concept.

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cc:

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Mahaska County
PIN Number: 25-62-063-010
Project Number : NHSX-063-3(108)--3H-62
Location: N of Co Rd G63 to S of 293rd St - Various Locations
Type of Work: 1012-PCC Pavement - Replace
Project Directory: 6206301025

60

59

58

63

57

Approximate Crossover Location

290th ST.

293rd ST.

Approx. Sta. 1355+00
Approx. Sta. 1353+50

Approx. Sta. 1345+00
Approx. Sta. 1342+00
Approx. Sta. 1339+00

Approx. Sta. 1328+00
Approx. Sta. 1323+50
Approx. Sta. 1316+50

Approx. Sta. 1297+00
Approx. Sta. 1294+00

Approximate Crossover Location

County Road G63/310th ST.

310th St

310th St

Utilities

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