US64/491 San Juan Bridge Crossing in Shiprock, NM CN: 5101010

Introductions

– NMDOT Team
  • Manuel Maestas, P.E. – PDE North Region Design
  • Stephen Lopez, P.E. – NMDOT D5, Technical Support Engineer
  • Jennifer Mullins – Environmental
  • Sherman Peterson, P.E. – NMDOT Bridge Bureau

Design Team
  • TYLIN International
  • Lee Engineering
  • Marron and Associates
  • Cobb Fendley
  • GeoMat

Stakeholders
  • NMDOT – D5
  • Navajo Nation
  • Navajo DOT
  • Shiprock Chapter
  • US Fish and Wildlife
  • NM Game and Fish
  • Navajo Travel Utilities
  • NMED
  • USCOE
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Agenda

– Introductions
– Project Descriptions and Purpose
– Existing Conditions
– Phase A/B
– Questions & Open House

What do we want from you?
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Project Description and Purpose

– Technical Definition – Phase A/B Corridor Study
  • Phase A/B (Initial Evaluation of Alternatives)
    • Assess Existing Conditions, Identify Purpose and Need, and Evaluate Alternatives
    • Consider: Safety, ROW, Access, Environmental, Public Input, Costs
    • Deliverable: Recommendations within Project Priority Plan

In summary...Evaluate the existing conditions and recommend a new bridge structure and alignment/intersection for the corridor.
Existing Conditions - Roadway

- Ramps and driveways are not PROWAG/ADA Compliant
- Sidewalks are in poor condition
- Signs need update based on reflectivity
- Horizontal geometry of intersections need improvement
- Access control is a concern
Existing Conditions - Traffic

• Traffic counts were conducted at two locations, one on each end of the bridge.
• Crash data was obtained to conduct an analysis of the corridor to determine specific intersection and corridor crash rates.
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Existing Conditions - Structures

- Bridge 1792 is Structurally Deficient and Historic
- Bridge 7148 has a Sufficiency Rating of 85.0
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Existing Conditions - Geotechnical

- Shiprock is situated on sedimentary rocks known as Mancos Shale
- San Juan River flows from east to west through Shiprock
- Unconsolidated alluvial deposits consisting of sand, gravel, and cobbles occur in areas along the river corridor
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Existing Conditions - Environmental

• Environmental Process
  – National Environmental Policy Act (NEPA)
  – NMDOT Location Study Procedures
  – Environmental field studies
  – Public stakeholder involvement
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Existing Conditions - Environmental

- Natural Environment
  - Water/Wetlands
  - Geology
  - Wildlife
  - Soil, Air
  - Protected Species

Photos: U.S. Fish & Wildlife Service
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Existing Conditions - Environmental

- Human Environment
  - Cultural Resources
  - Land Use
  - Socioeconomics
  - Noise, Aesthetics
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Existing Conditions - Environmental

• Context Sensitive Solutions
  – Uniqueness of the town of Shiprock,
  – Corridor is on the Navajo Nation
  – Bridge crosses the San Juan River
  – Registered Historic Bridge
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Existing Conditions - Utilities

• Completed a Level D SUE Analysis
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Access Management

- Evaluating existing driveways and median openings
- Evaluating options and configurations to improve efficiency
Multi-Modal Transportation

- Potential to expand exiting transit systems in area
  - Repurpose DPS Facility?
  - Red Apple Transit
  - Navajo Transit
  - NMDOT Park & Ride
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Phase A/B: Evaluation of Alternatives

• Inventory of Existing Conditions
• Identify and Evaluate Viable Alternatives
• Phase A/B Documentation and Decisions

Identified Alternatives

• Three alignment alternatives
• Three unique intersection alternatives
• Seven bridge alternatives
Phase A/B: Evaluation of Alternatives

- Evaluation Matrix Criteria
  - Functional Requirements
  - Construction Feasibility
  - Environmental Impact
  - Aesthetics
  - Economics
  - Future Maintenance
  - Accelerated Bridge Construction
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Alignment Alternative – 2 Lane to South of Bridge No. 7148
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Alignment Alternative – 4 Lane along 7148 Bridge CL Alignment
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Alignment Alternative – 4 Lane North of Bridge No. 1792 (Truss)
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Enhanced Signal Intersection Alternative at San Francisco Peak Blvd.
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Enhanced Signal Intersection Alternative at Hesperus Peak Blvd.
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High – T Intersection Alternative at San Francisco Peak Blvd.
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High – T Intersection Alternative at Hesperus Peak Blvd.

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Roundabout Intersection Alternative at San Francisco Blvd.
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Roundabout Intersection Alternative at Hesperus Peak Blvd.
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2 Lane South – Prestressed or Steel Girder Bridge (various spans)
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4 Lane North – Prestressed or Steel Girder Bridge (various spans)
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4 Lane South – Prestressed Steel Girder, Cable Stayed, or Segmental (various spans)
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Segmental and Cable Stayed Profiles
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Project Schedule

- Inventory of Existing Conditions
- Phase A/B Report Draft and Final Report
- Phase C (Environmental) and D (Preliminary Design)
- Phase II Final Design
- Construction Multi Year Process
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Questions?

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Widen Bridge No. 7148: 4 Lanes 12 Spans

OUT TO OUT WIDTH = 71'-0"

1'-6" 10'-0" SHOULDER 12'-0" DRIVING LANE 12'-0" DRIVING LANE 12'-0" DRIVING LANE 12'-0" DRIVING LANE 10'-0" SHOULDER 1'-6"

HALF SECTION @ ABUT HALF SECTION @ MID SPAN

4'-0" (5) EXIST. AASHTO TYPE 54 GIRDER SPA @ 9'-0" = 36'-0"

CONCRETE DIAPHRAGM (TYP.) 9'-0"

(3) NEW AASHTO TYPE 54 GIRDER SPA @ 9'-0" = 18'-0"

TRANSVERSE SECTION
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Prestressed Concrete Girders: 2 Lanes 12 Spans South
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Steel Plate Girders: 2 Lanes 6 Spans South
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Prestressed Concrete Girders: 4 Lanes 8 Spans North
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Prestressed Concrete Girders: 4 Lanes 8 Spans South

OUT TO OUT WIDTH = 71'-9"

CONSTRUCTION

1'-6" 10'-4½" SHOULDER 12'-0" DRIVING LANE 12'-0" DRIVING LANE 12'-0" DRIVING LANE 12'-0" DRIVING LANE 10'-4½" SHOULDER 1'-6"

HALF SECTION @ ABUT, HALF SECTION @ MID SPAN

AASHTO TYPE T2 MOD. (TYP.)

INTERIOR STEEL DIAPHRAGM

TRANSVERSE SECTION
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Steel Plate Girders: 4 Lanes 6 Spans North
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Steel Plate Girders: 4 Lanes 6 Spans South
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Segmental Concrete Girders: 4 Lanes 3 Spans North
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Segmental Concrete Girders: 4 Lanes 3 Spans South
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Cable-Stayed: 4 Lanes 2 Spans North
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CABLE-STAYED: 4 Lanes 2 Spans South

[Diagram of the bridge crossing with labels for existing and new bridges, directions of work, and construction details.]