

Project Information for Constructability Review

TN

I-24 Interchange at SR-15 (Exit 134)
Ramp Improvements and Lighting
TDOT PIN 133134.00

Region 2, Marion/Grundy County

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Project Description

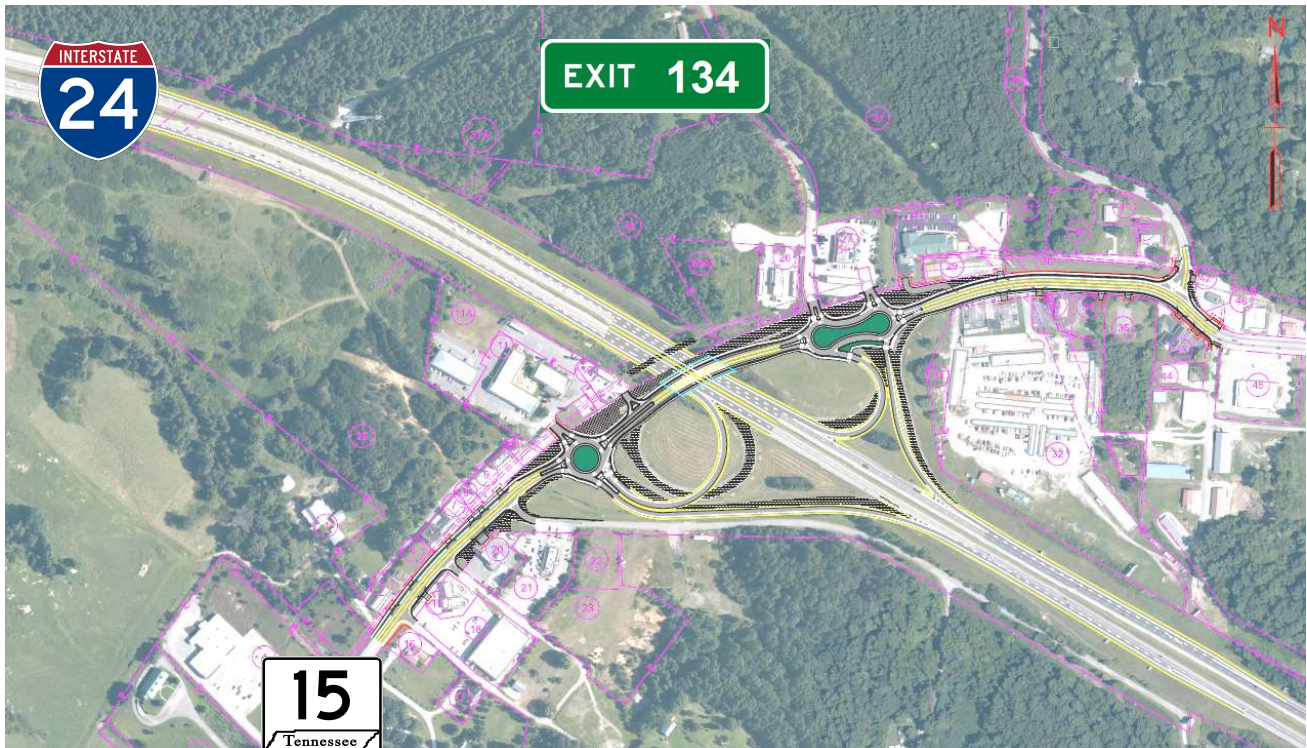
Originated from the Rural Interchange Improvement Program, FY22-23.

Project will be delivered as Design/Bid/Build. Right of Way acquisition will begin in Summer 2025 and the project will be ready for Letting to Construction in Fall 2026.

Scope Summary

Proposed improvements include the following to improve operations, safety, and modernization of the interchange.

- Remove the two SR-15 bridges and replace with a single 3-span concrete bridge with walled abutments
- Remove the railroad bridge
- Reconfigure 3,200-ft of SR-15 to a 3-lane curbed roadway, with bicycle and pedestrian facilities including extension of the Mountain Goat Trail between Indigo Lane and SR-2 (US-41)
- Reconstruct the ramps between I-24 and the roundabouts
- Replace interchange lighting with high mast and offset



The project location and existing interchange configuration are contributing factors in anticipated challenges. The interchange is a partial cloverleaf with all ramps being on the east side, such that overhead bridge work that cannot be completed above live traffic is not easily detoured.

- The existing SR-15 bridges are integrally cast and must be demolished in a controlled, load reducing manner.
- Exit 127, 7 miles to the west, is the nearest opportunity for motorists to detour to avoid the work zone, and the US-41 detour route is not suitable for trucks nor a detour of both I-24 directions simultaneously.
- I-24 rolling roadblocks may be possible, but would occur as traffic ascends an elevation change of approximately 900-ft. Clearing the queue may take additional time.
- Running I-24 traffic around the bridge is not possible due to the partial cloverleaf, all traffic passes under SR-15.
- TDOT desires to maintain 2-lanes of I-24 traffic to the maximum extent possible, permitting reduction to single lane during off-peak periods such as weekends.
- Converting SR-15 “T” intersections into roundabouts, including grade changes and pavement reconstruction.

General Closure Elements

The contractor will be required to always maintain at least a single lane in each direction, and both lanes are to be maintained open outside of active working periods and specific weekend activities.

We require a physical barrier between opposing directions of I-24, which necessitates barrier wall placement such that 2-lanes can be maintained when the crossover is not in use for overhead bridge work.

EB Exit and WB Entrance ramp closures with detours to Exit 135 will be permitted for ramp crossover work, roundabout tie-ins, and bridge demolition and construction. This is typically a 3-mile detour adding about 5-6 minutes.

The detours would be allowed continuously for a period to be determined, assume 30-days for each bridge demolition. We do not anticipate meaningful production with rolling roadblocks and an I-24 detour to US-41 is unacceptable due to geometrics and the anticipated duration.

Bridge Demolition and Construction

The existing bridges are integral cast and require breaking into approximately 10-ft segments or squares to be lifted off by crane, starting with outer walls, then decking to remove dead load on the beams. This work will be required to be completed without active traffic under the bridge.

I-24 traffic may be routed to one side of the interstate to maintain 2 lanes in one direction and 1 lane in the opposing direction in combination with the ramp detours.

For instance, implement the ramp detours, shift 2-lane WB onto the outside lane/ramp auxiliary lane/shoulder as needed, install barrier rail, shift EB I-24 as a single lane onto the WB inside lane and inside shoulder, with barrier rail separating EB from the work zone. Complete weekend work, then restore EB to the normal configuration while leaving WB in the shift. Repeat each weekend until demolition is complete. This will require some work on the outside shoulders to achieve a smooth shift in anticipation of traffic maintaining pre-construction speeds within the 2 lanes.

As the bridge demolition must progress along SR-15, say south to north, the crossover would need to shift from WB to EB in consecutive weekends. The ramp detours allow the temporary barrier rail to be set in place and left for the duration of this phase.

The ramp detours would remain in place throughout bridge demolition, allowing the ramp construction to occur. Separate ramp detours are to be avoided since this work can be completed during bridge demolition.

1. Bridge Demolition and Construction

- a. Do you have any concerns with the proposed phasing for the demolition of the SR-15 bridges?
 - i. Designed haul roads are not planned to be included, as all work is accessible from within the interchange and outside shoulders of I-24. Do you see any issues with placement of cranes, room for working/material storage or movement, or access?
- b. The Department is considering limitations on the allowable weekend closures for bridge demolition and erection.
 - i. How long overall do you think it will take to demolish the NB SR-15 bridge?
 - ii. How long overall do you think it will take to construct the new SR-15 bridge?
 - iii. How long overall do you think it will take to demolish the SB SR-15 bridge?
 - iv. How long overall do you think it will take to demolish the railroad bridge?
- c. If a total interstate closure (detour) were permitting, could you demolish a portion or the entirety of the existing bridge within a short off-peak window (Friday 8 PM to Monday 6 AM)? This may necessitate shoring/falsework if the entire bridge is not removed.

2. SR-15 and Roundabout Construction

- a. Do you see any challenges to the maintenance of SR-15 traffic during construction of the roundabouts?
- b. Do the ramp closures and detours, along with the I-24 shifts, provide sufficient working room to complete the grade changes without temporary ramp alignments?
- c. Do you anticipate being able to maintain access to all driveways during construction?

3. Utilities

- a. Do you foresee any challenges with proposed jack and bore locations and proximity to environmental features or areas identified as impacted?
- b. Do you see any phasing issues with removal of the railroad bridge and associated utilities?

4. Staging and Material Handling

- a. If the I-24 rest areas were closed would that be beneficial for equipment and material staging?

5. Do you have any ideas for implementing innovation that may expedite the overall project completion, improve constructability, or reduce project cost that we may not have already discussed?

