I-40/240 Phase II Project

March 26, 2015
Agenda

- Project History & Scope
- Flyover Progress (East and Westbound)
- Additional Construction
- Media Outreach
History

• Initially designed in the 1960’s, the I-40/240 interchange on the eastern side of Memphis was constructed with the idea that I-40 would be routed through the heart of the city.

• In 1971 the U.S. Supreme Court ruled that the interstate would not be built through Overton Park. Thus, I-40 was routed onto the northern half of the I-240 loop via 1 lane ramps.
1960’s Design
Scope

• The inadequacy of the reroute, coupled with population growth and increasing truck traffic has caused the interchange to become a major point of congestion.

• Approximately 200,000 vehicles traverse the interchange daily.

• Completed in 2003, the Phase I project added a 2-lane flyover ramp from I-40 westbound to I-240 westbound.

• The I-40/240 Phase II project addresses many capacity issues at the interchange. Primarily, it adds two, 2-lane flyover ramps for I-40 in both directions.

Image Source: The Commercial Appeal

Typical morning rush-hour, I-40, three miles east of interchange >>
The I-40/240 Phase II project is the most expensive contract let in TDOT’s history at $109 million.

The prime contractor, Dement Construction Co., began work on October 22, 2013 and is expected to be completed by July 31, 2017.

The interchange is expected to handle 350,000 vehicles per day by 2035.
Aerial Tour of I-40/I-240 Project

• Click on link or press play to view video:
• http://www.youtube.com/embed/pxggL052FkM?rel=0&autoplay=1
Phase II: Stage 1 Overview

1. East Bound Fly Over
2. West Bound Fly Over
3. Widening of I-240 northbound overpass over Summer Avenue
4. Modification of on/off ramps to Summer Avenue
5. Relocation and realignment of Frontage Road
6. Widening of I-240 eastbound overpass over Greenline
7. Widening of I-240 eastbound to I-40 eastbound
8. Widening of Sam Cooper Boulevard
I-40/I-240 Interchange  Phase II: Stage 1
I-40 Eastbound Flyover
Phase II: Stage 1

• Tallest ramp of the interchange
• Length – 2,322 ft
• Stands about 95 ft above ground level at its highest point
• Clears the I-240 Westbound flyover by 16.5 ft
• Has a 5.65% maximum upgrade for 740 ft
• Has a 6.97% maximum downgrade for 420 ft
• Has a design speed of 50 mph
I-40 Eastbound Flyover: Piling

- Friction pilings at Abutment 2
- The total of precast concrete piles for Bridge 2 is 32,400 ft. This includes both abutments and every pier.
I-40 Eastbound Flyover: Piling

VIDEO: Pile driving on Pier 1
I-40 Eastbound Flyover: Abutment

VIDEO: Compaction at Abutment 1
The footings for Bridge 2 are 6.5 ft deep, 29 ft long and 29 ft wide.

Bridge 2 has a total of 12 piers.
I-40 Eastbound Flyover: Caps
Phase II: Stage 1

- Steel bar reinforcement for the piers, abutments, and retaining walls totals 1.1 million lb.
• On September 4, 2014 the first steel girders on Bridge 2 were set in place between Pier 1 and Abutment 1.
Each steel girder for Bridge 2 has a web depth of 5.5 ft. and weighs between 15.0 and 30.5 tons.
I-40 Eastbound Flyover: Girders

- The girders make up the majority of the 5.3 million lbs. of steel used for the superstructure.
- Bridge 2 has 27,572 bolts (includes those in diaphragms and bracing)
Bridge 2 has 13 spans and all 110 steel girders now in place.
I-40 Eastbound Flyover: Studs

VIDEO: Shear stud installation (grinding surface)
I-40 Eastbound Flyover: Studs

VIDEO: Shear stud installation (welding studs)
The deck of Bridge 2 requires 900,000 lb of epoxy coated reinforcing steel.
The deck will require 2,782 yd³ of Class D concrete. Concrete placement will be complete 03/27/2015.
• The new concrete ramp leading up to Bridge 2 will consist of two 12 ft. travel lanes.
I-40 Westbound Flyover Phase II: Stage 1

- Clears I-240 by 17.8 ft
- Length – 1,565 ft
- Has a 4.25% maximum upgrade for 100 ft
- Has a 5.58% maximum downgrade for 20 ft
- Has a design speed of 50 mph
Bridge 1 will tie into Pier 21J which also supports the I-240 westbound flyover. This pier is being retrofitted to fit the new design.
Construction of the abutment for Bridge 1. This abutment and retaining wall requires 24,100 lb of steel bar reinforcement and 23,400 lb of epoxy coated reinforcing steel.
I-40 Westbound Flyover: Piers

VIDEO: Pouring concrete for the column of Pier 7
• Piers 5 & 6 (6 in foreground), Pier 4 being constructed in background.
• 3,036 yd$^3$ of Class A concrete is required for the piers and abutment of Bridge 1.
On September 16, 2014 the first steel girders on Bridge 1 were set in place between Piers 5 and 6.
• Consists of 8 spans and has 35 of its 70 steel girders installed.
• Bridge 1 has 18,520 bolts (includes those in diaphragms and bracing).
The steel girders for Bridge 1 range in length from 85 to 134 ft. They are 6 ft deep and weigh between 18.5 and 32.5 tons.
Trucks arriving with steel girders on Saturday morning, March 14, 2015.
Bridge 1 superstructure consists of 3.7 million lbs. of steel.
I-40 Westbound Flyover: Girders

- Connecting to the existing flyover
I-40 Westbound Flyover: Deck

- The deck of Bridge 1 requires 542,000 lb of epoxy coated reinforcing steel.
The deck for Bridge 1 will require 1,910 yd$^3$ of class D concrete. So far 450 yd$^3$ have been placed, about 24%.
Exit to Summer and Frontage Road

• The widening of the I-240 northbound overpass allows for the addition of a second exit lane so that traffic from both I-40 westbound and I-240 northbound can exit onto Summer Avenue.

• The Frontage Road will now connect directly to Summer Avenue instead of onto the I-40 ramp.
This overpass is being widened to realign the ramp from I-40 westbound to exit only onto Summer Ave. It utilizes prestressed concrete bulb-tee beams, each at 134.5 ft in length.
VIDEO: Pouring concrete for north retaining wall
Ramp to Summer & Frontage Road

Grading on Summer exit ramp

New entrance to Frontage Road
This overpass above the greenline is being widened to accommodate the widening and realignment of Ramp A which carries traffic from I-240 eastbound to I-40 eastbound. The design on the east side utilizes prestressed concrete box beams.
The widening on the west side is being completed to accommodate the extension of the exit ramp to Sam Cooper Boulevard. It utilizes prestressed concrete I-beams.
I-240 Eastbound Overpass

- I-240 eastbound overpass with completed deck. The deck required 117 yd$^3$ of Class D concrete.
Construction of catch basins on Ramp A. Once complete, the ramp will carry 3 travel lanes from I-240 eastbound to I-40 eastbound.
I-240 Eastbound Ramp

VIDEO: Placing concrete blocks for retaining wall.
I-240 Eastbound Ramp (Ramp A)

- Construction of retaining wall
I-240 Eastbound Ramp

- Construction of concrete surface and steel for parapet wall
I-240 Eastbound Ramp

- 2 concrete travel lanes nearly complete
The next phase of traffic control will move traffic onto the newly completed I-240 EB/I-40 EB ramp (1 lane each)
Widening Sam Cooper Boulevard

- The outside lanes of Sam Cooper were milled and resurfaced first.
Widening Sam Cooper Boulevard

VIDEO: Milling old asphalt pavement on Sam Cooper.
Widening Sam Cooper Boulevard

• Paving of base asphalt on Sam Cooper eastbound under the I-240 northbound overpass.
Once complete, Sam Cooper Blvd will have 3 westbound lanes and 3 eastbound lanes, one of which will exit to I-40 westbound.
Additional Construction
Phase II: Stages 2 & 3

• Stage 2 will include the replacement of the I-40 Wolf River Bridge.
• Stage 3 will include modifications to the Covington Pike interchange which will widen Covington Pike underneath I-40 and lengthen the turn lanes onto I-40.
• I-40 westbound between the I-40/240 interchange and Covington Pike will also be widened from 3 to 5 lanes.
• Stage 2 of construction involves the demolition and replacement of the I-40 Wolf River Bridge which is located just east of the interchange.
I-40 Wolf River Bridge  Phase II: Stage 2

• The current bridge carries 4 lanes of I-40 westbound and 6 lanes of I-40 eastbound.
• It is 180 ft wide and 928 ft long.
I-40 Wolf River Bridge Phase II: Stage 2

The present bridge has 14 spans and has been widened multiple times in its history.
I-40 Wolf River Bridge Phase II: Stage 2

The new bridge will:

- be 1,145 ft long and 202 ft wide
- have 11 spans with the longest span over the Wolf River at 160 ft
- carry 6 lanes westbound and 7 eastbound
- require 3.2 million lb of reinforcing steel, 9,749 yd³ of concrete, 38,770 ft of steel pipe piles (24 in.), 161 prestressed concrete bulb-tee beams (spans 5 to 11), and 108 steel girders (spans 1 to 4).
• Production piling on the south side of the bridge.
• Construction of the new bridge will be phased.
• Three lanes of traffic will be maintained in each direction.
Installation of a retaining wall on I-40 westbound before the Wolf River bridge. This is being constructed to widen westbound I-40 for 6 travel lanes.
Covington Pike Interchange

- The widening of westbound I-40 from 3 to 5 lanes requires that the overpass at Covington Pike be widened. The widening will utilize 6 prestressed concrete box beams and retaining walls will be installed underneath both abutments.
Covington Pike Interchange
Phase II: Stage 3

Present Layout

Modification

Bridge Widening
• Both directions of I-240 between the 40/240 interchange and Walnut Grove Road will be widened from 4 to 5 lanes.
• The exit lane from I-240 to westbound Sam Cooper Blvd will be extended.
• Also, a noise wall will be added on the west side of I-240 in this section.
Dynamic Message Signs (Color)

- 32,000 distinct colors using red, green and blue LEDs
- 8 ft X 30 ft
- Installed at 2 locations on I-40 WB before interchange
Incentive/Disincentive

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<td>December 15, 2016</td>
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<tr>
<td>June 30, 2017</td>
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**DISINCENTIVE**

| After | July 31, 2017 | Deduct $25,000 per calendar day no limit |

**Any NO EXCUSE BONUS earned by the Contractor shall be waived if the Contractor or any of the Contractor’s Subcontractors or Suppliers experiences a fatality on the project.**

**SAFETY IS OUR #1 PRIORITY**
**Incentive/Disincentive**

<table>
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<tr>
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**DISINCENTIVE**

| After 540 Calendar Days | No Limit | Deduct $10,000 per calendar day |

**The work on the I-40 Bridge across the Wolf River will not be allowed prior to the completion of the items described by Milestones A through D in Special Provision 105E.**

A. Summer Ave Ramps/Frontage Road Completion
B. I-40 Westbound Flyover Completion
C. I-40 Eastbound Flyover Completion
D. I-240 EB Ramp to I-40 EB Completion
Outreach – Media/Public Relations

I-40 Westbound Detour

Detour Map:

- I-40 W To Little Rock, AR
- I-40W From Jackson/Nashville, TN
- Work Area

Detour Route:
1. Take Exit 10A to merge onto I-240 West towards Jackson, MS. 0.3 mi
2. Take Exit 13 and merge onto Walnut Grove Road East. 1.5 mi
3. Turn left to merge onto I-240 East toward Nashville. 1.6 mi
4. Continue as I-240 East merges with I-40 West. 2.5 mi

Detour Active:
Feb. 28th at 6:00 AM to Mar. 1st at 6:00 PM
QUESTIONS?
HTTP://WWW.TDOT.STATE.TN.US/I40-240MEMPHIS/