141/44 Design–Build Project: Interchange and ThrU–Turns

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Project Location

I-44/Route 141
Project Area Map
Project Goals

1. Deliver the project within the program budget of $25 million.

2. Maximize mobility on Route 141 and improve efficiency at the I–44 interchange and Vance Road intersection.

3. Deliver the project in a manner which demonstrates the importance of safety.

4. Provide a quality project resulting in a long–lasting transportation facility that minimizes future maintenance.

5. Deliver the project using a diverse workforce.

Timeline

- Proposal Phase: Fall 2015
- Team Selection Announced: January 2016
- Groundbreaking: June 2016
- Project Completion: July 2018
Project Team
Major Participants

PACE CONSTRUCTION

AECOM

LOCHMUELLER GROUP

KUESEL
I-44 Interchange Segment 1

- WB I-44 Off Ramp
- Dual-lane exit from WB I-44
- Free flow flyover ramp
- Updated design moves traffic faster and more efficiently
- Easier access to/from N. Outer Rd.
- 2 free flow loop ramps
- N. Outer Rd.
- N. Hwy Dr.
- S. Hwy Dr.
- Ramps separated from interstate
- Triple left reduces backups and improves safety for EB ramp
I-44 Interchange
Additional Applicable Standards

- Loop Ramp Design – South Dakota
- Bridge – Girder and Barrier Standards – Illinois, Nebraska and Texas
Ameren Tower Relocation

- Flyover Ramp Clearance Requirements:
  - 23’ clearance over railroad
  - 26’ clearance under transmission line
- One tower constructed and the line raised
Ramp 1 (WB On Ramp)

- Provides access from SB Route 141 to WB I-44
- Maintains access between Route 141 and N. Outer Road via side ramp
  - Buder Park
  - Lone Elk Park
  - World Bird Sanctuary
N. Highway Drive

- Restriped to accommodate three lanes between I-44 off ramp and C-D Road
- Moved Intersection at Route 141 further to the north
Interstate 44

- Auxiliary Lanes Extended to/from Bowles Ave. Exit (under separate contract)
C–D Road

- Allows most turning traffic to avoid Route 141/N. Hwy. Dr. intersection
- Barrier-separated from I–44
- Curved alignment
Ramp 6 (SB 141 to EB I–44) Flyover

- Single Lane Ramp
- Cost-efficient geometrics/span arrangements
- Prestressed concrete girder superstructure
- Hammerhead Piers
- Coordination with BNSF
Ramp 6 (SB 141 to EB I-44) Flyover
C–D Bridge

- Single span over Route 141
- Prestressed concrete girder superstructure
- Integral end bents
Value-Added Improvements

- Extended northbound left turn lane at Elam Avenue
- Eastbound approach improvements at Meramec Station (south) intersection
- Widened shoulder for southbound Route 141 under I-44
Drainage Design

- Does NOT Address River Flooding

- Drainage Task Force Meetings
  - AECOM/Pace/MoDOT equal partners in design
  - Drainage Modeling provided by designer and owner

- SE & SW Quad Options Evaluated
  - Detention Basins/Ditch Widening
  - Additional Pipes
  - Raise Route 141
  - Acquisition of Park Land (SE Quad)
Drainage Design

- **SE Quad Improvements**
  - Segregated Detention Basin at SE corner of Route 141/S. Highway Drive
  - Detention Basin/Ditch Widening in front of Steak ‘n Shake
  - 5’ X 2’ Box Culvert under Ramp 6 (Flyover Ramp)
Drainage Design

- SW Quad Improvements
  - Expanded Storage Volume of Existing Infield
  - Added new pipe under Ramp 2 (EB Off Ramp)
The Flood of 2017
The Flood of 2017

- Late April/Early May
- Equipment Moved to High Ground
- In-Progress Work and Traffic Control Devices Secured
The Flood of 2017

- River Crest: Elevation 435 +/-
- Route 141 Low Point: Elevation 419 +/-
- Road Closures: Route 141 – 8 Days
  I–44 – 2 Days
The Flood of 2017

- Work Halted for up to 2 Weeks
- Partial Rebuilding of East MSE Wall at C–D Bridge Required
Vance Road Intersection Segment 2

- Updated design and simplified signal timing mean traffic moves more quickly and safely
- Forest Ave lane additions
- Use of Thru-Turn
- Longer turn lanes prevent turning traffic from blocking through lanes
- Provides good balance of 141 corridor mobility and local connectivity
- Use of Thru-Turn

Design Build
PACE
LOCHMUELLER GROUP
KUESEL
AECOM
ThrU–Turns

- Facilitate left turns from Route 141 to side roads
ThrU-Turns
How They Work

- Left Turns Prohibited at Intersections
- Reduce Conflict Points
- Simplified Signal Design (2-Phase)
ThrU–Turns
Why use ThrU–turns on 141?

- UPRR Bridge Constraint
- Utility Corridor on West Side of Route 141
- Minimal Right–of–Way Impact
- Provide Pair Instead of Single ThrU–Turn
ThrU–Turn Web Page:
www.modot.org/thru–turns
ThrU–Turns Smooth Rollout

- Changeable Message Signs (CMS)
- Open After End of School Year
- Single Construction Phase Opening
- Law Enforcement Presence
ThrU-Turns Signing and Pavement Markings

- MoDOT EPG & MUTCD Guidance
- Similar Location Types
- State DOTs
ThrU-Turns Northbound Traffic Comparison

- **August 2016**

- **August 2018**
ThrU–Turns
Southbound Traffic Comparison

- August 2016
- August 2018
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MoDOT I-44 at Route 141 - Design-Build

About the Project
AECOM leading the design for Pace Construction allowed MoDOT to address two major safety issues along the Route 141 corridor at I-44. (1) At the I-44 interchange, three new ramps pulled significant volumes of traffic out of previously congested intersections, improving corridor mobility and safety. (2) AECOM was able to reduce delays and crashes caused by left turning traffic queueing into the through lanes of Route 141 at the Vance Road and Marshall Road intersections by designing the first thru-turns in Missouri.

Entering Firm: AECOM
Client: MoDOT (Pace Construction)
Location: St. Louis County, MO
For More Information

Online:  
www.modot.org/route-141-i-44-design-build-project/

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