



I-440 Reconstruction

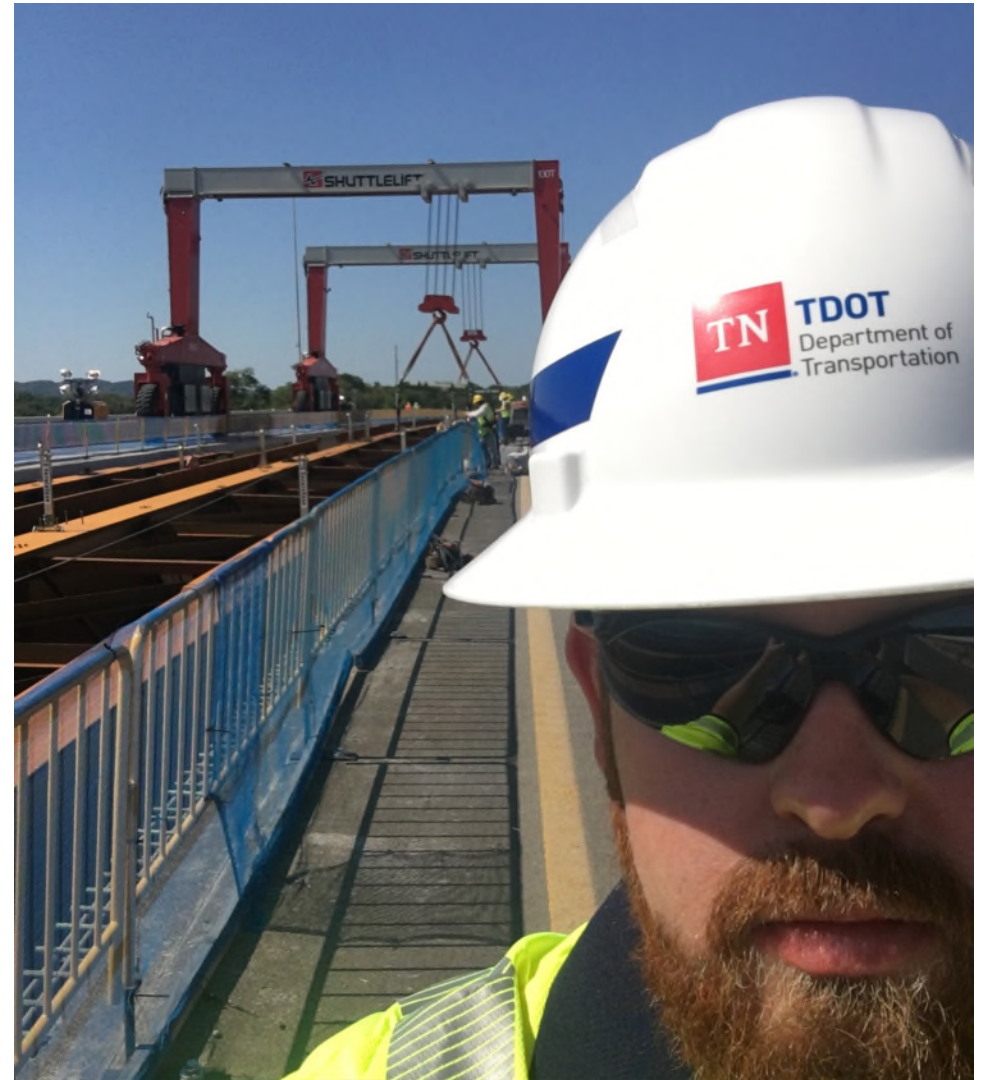
From Preparation to Execution

TSITE Virtual Summer Meeting | July 24, 2020



Clayton Markham, P.E.

CE Manager 2,
R3 Innovative Delivery





Project Overview

Project Overview

- Roadway Stats
 - Originally Built in the 1980's
 - 7.6 miles
 - 2 travel lanes w/ auxiliary lanes
 - Designed as a Parkway
 - 64,000 ADT limited-access highway
 - 100,000 ADT currently
 - 10" Thick Concrete
 - Grassy Median



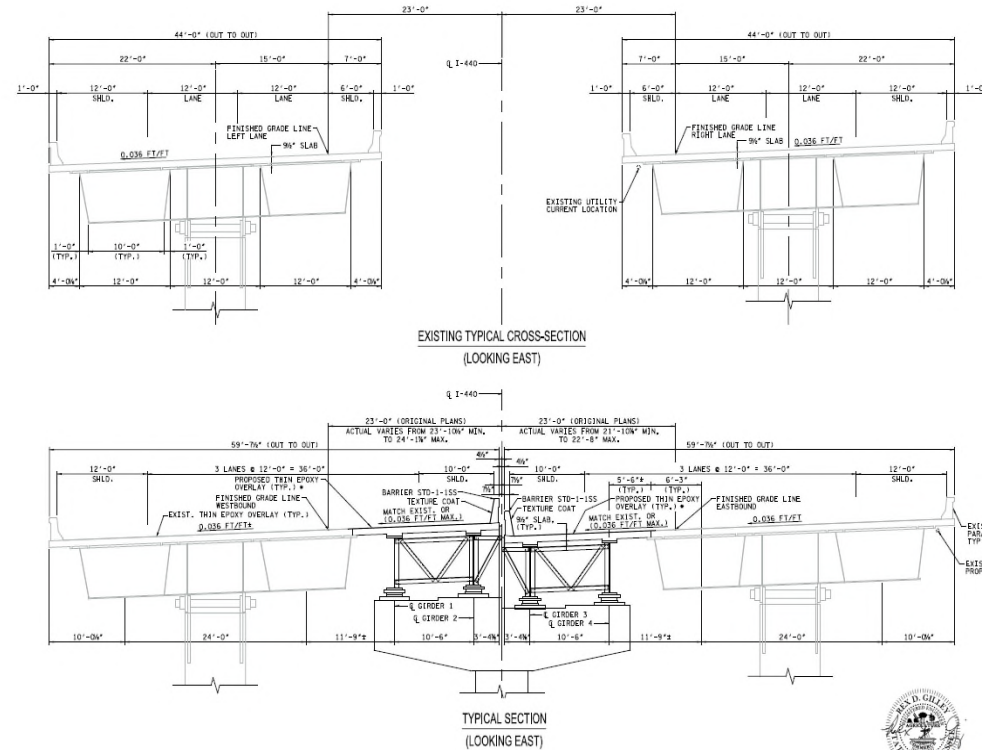
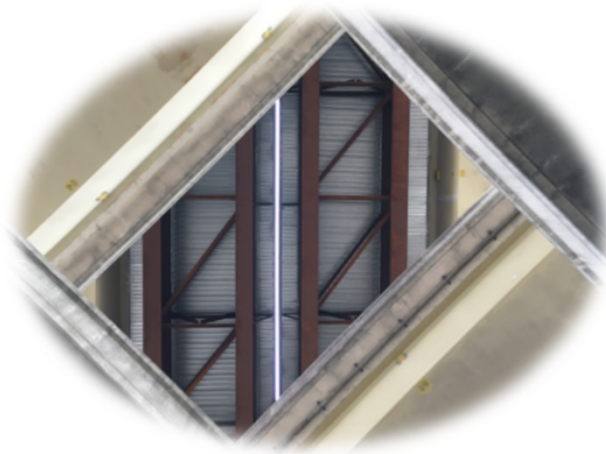
Project Overview

- I-440 Project Goals
 - *Address Pavement*
 - Concrete is 30 years old
 - Severe deterioration
 - Recent paving won't last
 - *Improve Safety*
 - Crash rates on I-440 are nearly double (1.8x) the statewide average
 - Since 2008, there have been 16 fatalities on I-440
 - *Address Congestion*
 - Hillsboro Pike / 21st Avenue
 - West End Avenue
 - Bridge over I-65



Project Overview

- I-65 Flyover Bridge
 - Widen bridges toward mediar to accommodate three (3) travel lanes



Project Overview

- Noise Wall Replacement/Repair



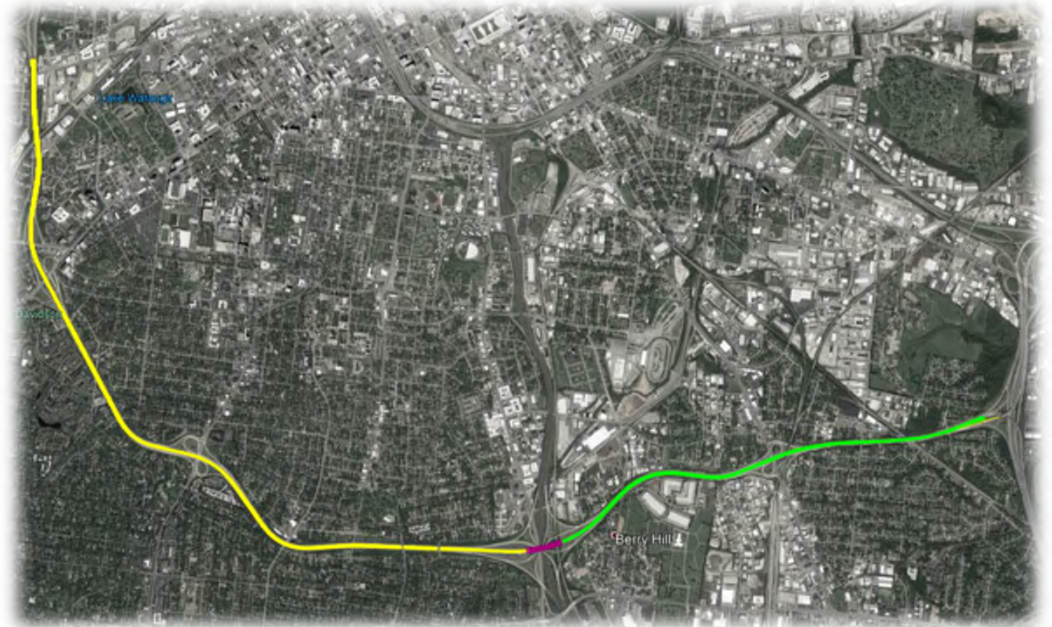
Project Overview

- ITS and Lighting Upgrades
 - DMS upgrades
 - Camera Upgrades
 - New LED lighting



Project Overview – RFP Allowances/Options

- Traffic Control Options
 - Option 1
 - Conventional Construction
 - Option 2
 - Full Segmented Closure
 - Option 3
 - Partial Segmented Closure (Segment 2 Only)
 - I-440 / I-65 Interchange Weekend Closures



Project Overview – RFP Allowances/Options

SP108B

SP108B

STATE OF TENNESSEE

REVISED 3/13/2018

REVISED 4/3/2018

REVISED 5/25/2018

REVISED 6/12/2018

(January 12, 2018)
Interstate 440
Davidson County
Contract #: DB1701

SPECIAL PROVISION

REGARDING

PROJECT COMPLETION AND LIQUIDATED DAMAGES

The project shall be completed in its entirety as set forth in RFP Book 2 Section D.3. The selected Traffic Control Option shall be implemented as described in Contract Book 3, Section 12.

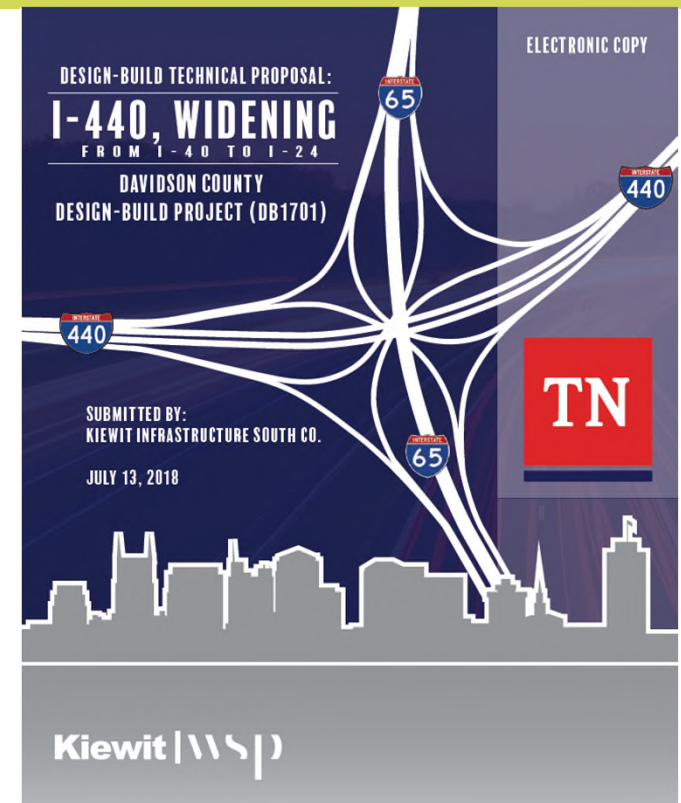
- Special Provision 108B
 - Lane Closure
 - \$7,500 per hour per lane
 - Traffic Control Option #2 & #3
 - \$400,000 per Calendar Day
 - Project Completion Date
 - First 30 Days: \$100,000 per day
 - Thereafter: \$400,000 per day



Preparation

Contract Info

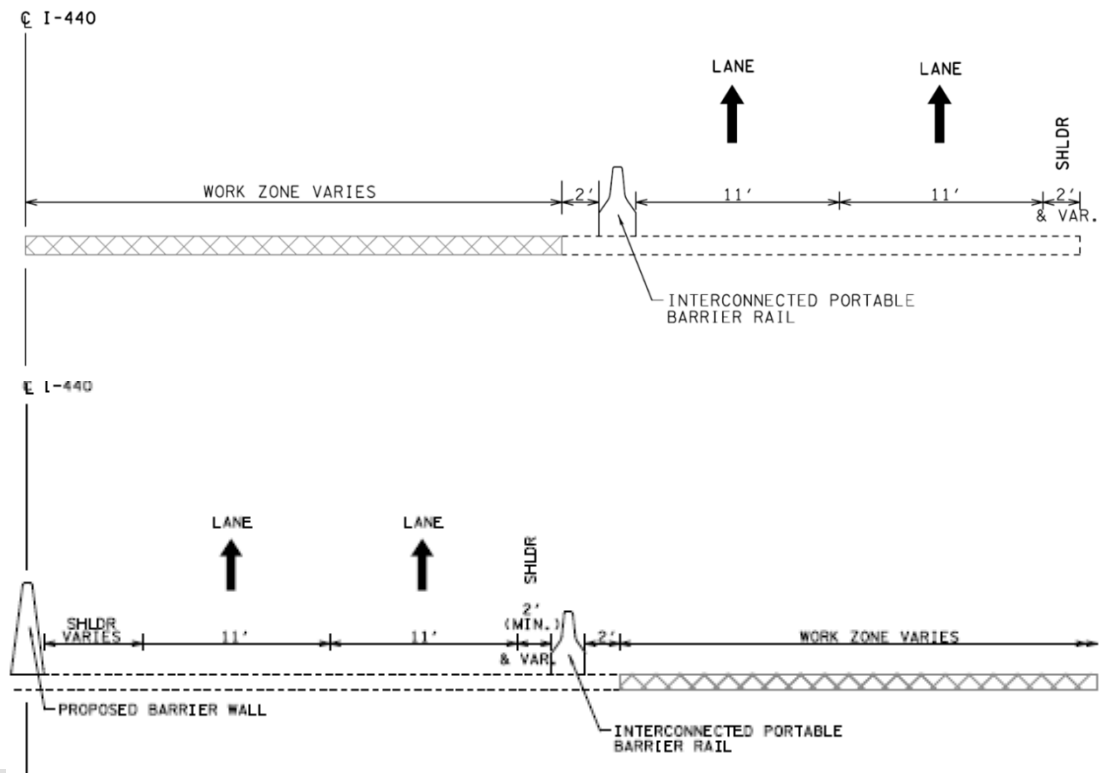
- Design-Build (DB1701)
 - combines all or some portions of the design and construction phases of a project into a single contract
- \$152.9 Million
 - (\$152,959,352.00)
- 708 Calendar Days
 - Start: August 17, 2018
 - Complete: July 24, 2020



Traffic Phasing

- Phase 1

- Phase 2



Traffic Phasing

- Phase 1
- Phase 2

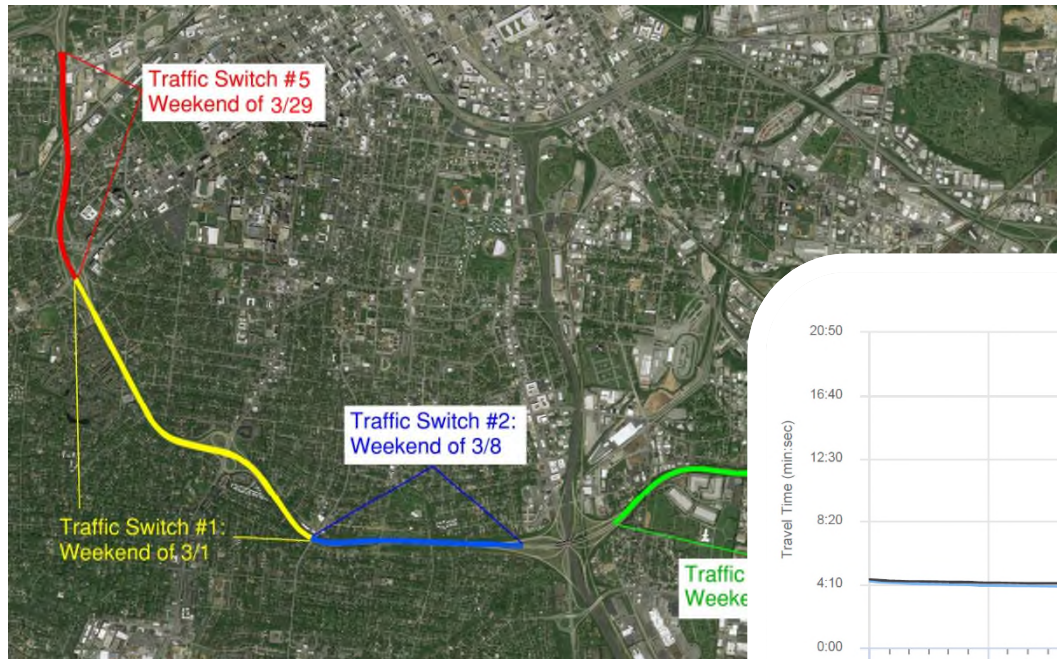


Incident Management

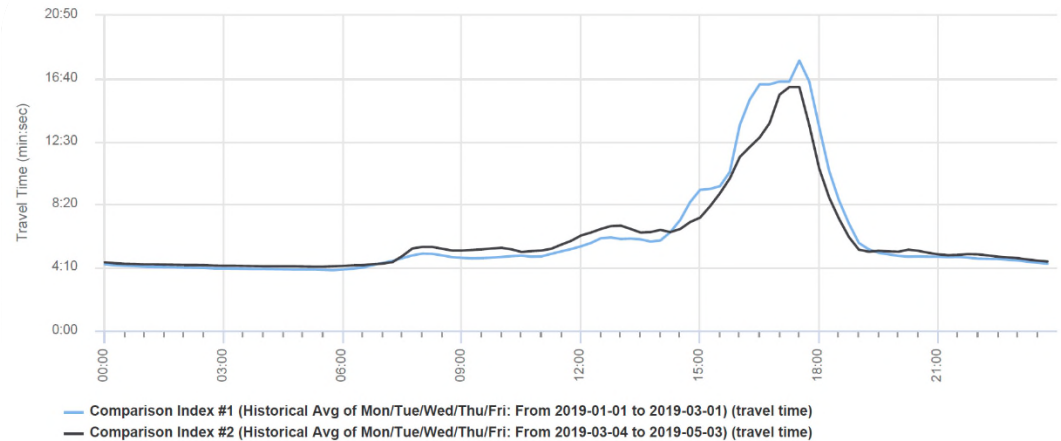


- Incident Management Plan Document
- Dedicated Help Trucks
- Organization Involvement
 - Nashville OEM
 - Metro ECC
 - Metro PD
 - Metro Fire
 - Public Works
 - Medcom (Vanderbilt)
 - THP
 - TDOT

Traffic Phasing



Historical Trends for Thompson Ln EB



Public Information

- Press Releases
- Informational Videos
- Community Meetings
- E-mail Updates
- Project Website

TDOT Awards I-440 Reconstruction Contract

Wednesday, August 01, 2018 | 10:02am

NASHVILLE, Tenn. – The Tennessee Department of Transportation today awarded the contract for the I-440 Reconstruction Project. The low bid was submitted by Kiewit Infrastructure South Co. at \$152.9 million. **The project will not include total closure of segments of I-440.** Rather, the winning design-build proposal will complete design and construction of the project in less than two years.

“Using the design-build approach for this project,” TDOT Commissioner Scott Lister-Jones said, “the winning proposal will allow us to complete the project in less than two years.”

Over the next 3-4 years, the project will include:

- Fall 2018 – completion of two eastbound Hillsboro
- Early 2019 – center raised median

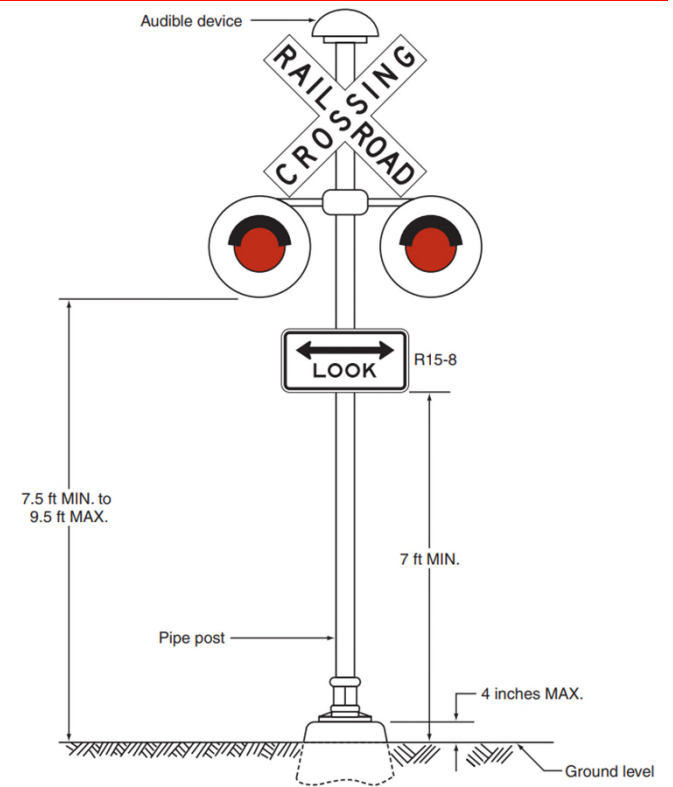




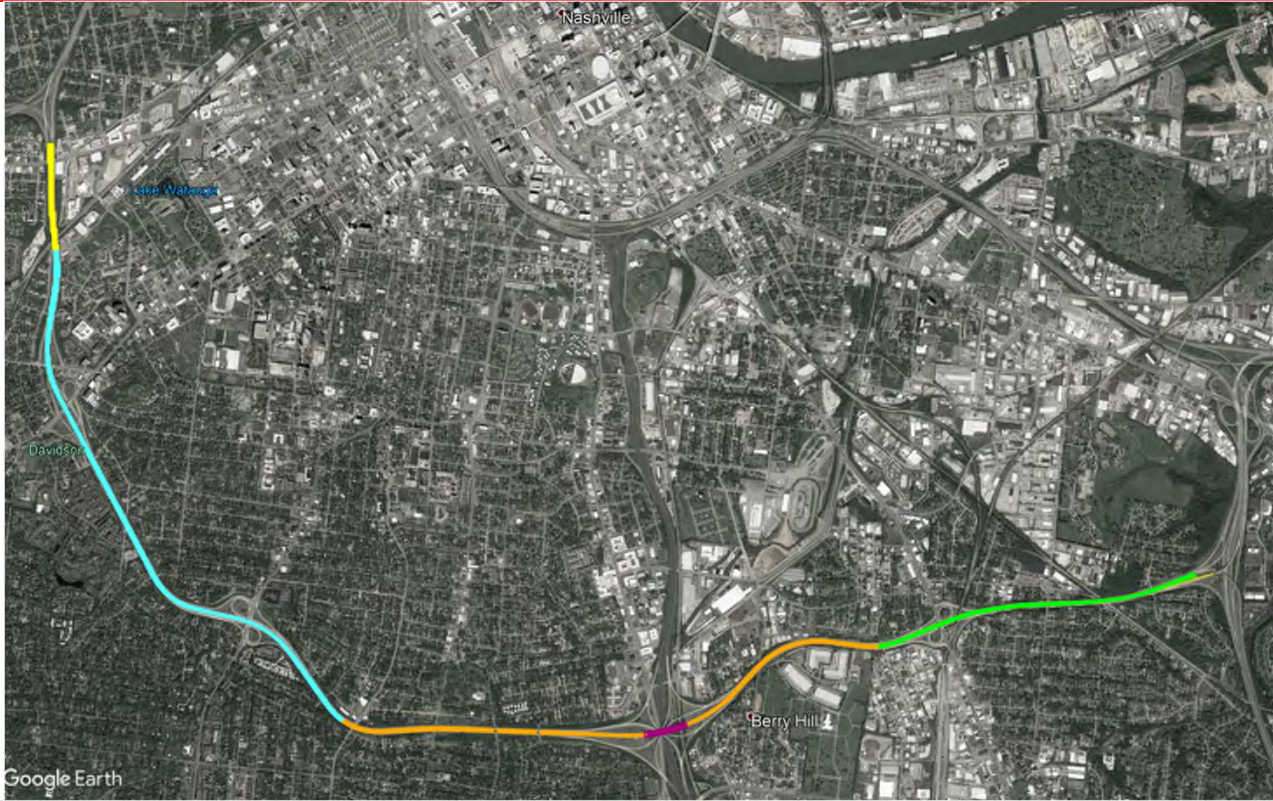
Design Challenges

Summary of Challenges

- Pre-Construction Challenges Included:
 - Compressed Time
 - Submittals
 - Design Exceptions



Design Packages



Schedule

Right-Of-Way

Construction

Package	DD Submitted	Comments Returned	DD Final Submitted	DD Concurrence	ROW/UT Certification Request	Utility Certification	ROW Certification	RFC Submitted	RFC Comments Returned	RFC Final	RFC Concurrence	NTP
EW 1 Hillsboro Ramp Queue					10/23/2018	10/23/2018	10/23/2018	9/10/2018	9/20/2018	10/2/2018	10/11/2018	11/8/2018
EW 2 Murphy Ramp Queue					10/23/2018	10/23/2018	10/23/2018	9/10/2018	9/20/2018	10/2/2018	10/11/2018	11/8/2018
EW 3 ITS Fiber Relocation					10/23/2018	10/23/2018	10/23/2018	10/17/2018	10/27/2018	11/16/2018	11/19/2018	11/20/2018
EW 4 Noise Wall					10/23/2018	10/24/2018	10/24/2018	10/18/2018	10/30/2018	11/15/2018	11/16/2018	11/19/2018
EW 5 Lighting					12/3/2018	12/4/2018	12/6/2018	11/7/2018	11/19/2018	12/3/2018	12/14/2018	12/17/2018
EW 6 MOT Phase 1					1/17/2019	1/22/2019	1/24/2019	12/20/2018	1/5/2019	1/22/2019	1/31/2019	1/31/2019
EW 7 RR Coordination								11/17/2018	12/10/2018	1/16/2019	1/24/2019	6/10/2019
<i>Near Charlotte Crossing</i>					5/14/2019	5/16/2019	6/7/2019					
<i>I-65 Bridge Crossing</i>					5/14/2019	5/16/2019	5/22/2019					
<i>Nolesville 1 Crossing</i>					3/8/2019	3/11/2019	3/13/2019					
<i>Nolesville 2 Crossing</i>					3/8/2019	3/11/2019	3/13/2019					
<i>Glenrose Crossing</i>					3/8/2019	3/11/2019	3/13/2019					
Segment 6 Rockfall Mitigation					1/22/2019	2/11/2019	2/13/2019	1/22/2019	2/4/2019	2/22/2019	2/27/2019	2/27/2019
Segment 7 Landscaping					4/16/2019	4/23/2019	4/23/2019	3/29/2019	4/22/2019	5/17/2019	5/30/2019	5/30/2019
Segment 8 MOT Phase 2					4/16/2019 - 5/30/19	5/31/2019	6/5/2019	3/8/2019	4/1/2019	4/22/2019	6/10/2019	6/10/2019
Segment 9 NW Repair					5/2/2019	5/3/2019	5/9/2019	4/25/2019	5/9/2019	8/9/2019	8/9/2019	8/9/2019
Segment 1	10/18/2018	10/29/2018	11/14/2018	11/20/2018	11/30/2018	11/30/2018	12/6/2018	1/8/2019	1/22/2019	2/11/2019	3/11/2019	3/11/2019
Segment 2	10/22/2018	11/5/2018	11/26/2018	12/3/2018	12/7/2018	12/14/2018	12/14/2018	3/3/2019	3/16/2019	4/4/2019	4/18/2019	4/18/2019
Segment 3	10/31/2018	11/14/2018	12/3/2018	12/7/2018	12/3/2018	12/4/2018	12/6/2018	2/13/2019	2/27/2019	3/16/2019	3/22/2019	3/22/2019
Segment 4	11/7/2018	11/16/2018	12/10/2018	12/12/2018	12/10/2018	12/11/2018	12/12/2018	2/28/2019	3/14/2019	4/9/2019	4/18/2019	4/18/2019
Segment 5	10/31/2018	11/1/2018	12/10/2018	12/14/2018	1/18/2019	1/22/2019	1/24/2019	2/12/2019	2/26/2019	3/22/2019	4/1/2019	4/1/2019

PlanGrid

- Plan Reviews & Submittal Tracking
 - 10 Business Day Review Period
 - 382+ Submittals to Date
 - 8837 Plan Sheets
 - 60+ Team Members



A screenshot of the PlanGrid web application interface. The top navigation bar shows the project name "DB1701 - I-440 Reconstruction - Davidson" and user information "Help Center Clayton Markham". The left sidebar contains navigation options: Home, Sheets, Tasks, RFIs, Field Reports, Documents, Photos, Submittals (highlighted), Team, and Settings. The main content area is titled "Submittals" and includes tabs for "Dashboard", "Packages", "Items", and "Settings". Below the tabs are buttons for "Create Package" and "Export". The "Overview" section features a progress bar and a legend: "Completed (375)" in green, "Upcoming (3)" in blue, "Overdue (1)" in red, and "Revise and resubmit (3)" in orange. Summary statistics are displayed in a row of four boxes: "2 assigned to me", "3 due from my team", "2 due from reviewers", and "0 due from submitters". The "Assigned to me" section shows a table with columns for "Submittal no.", "Title", "Received", "Due date", and "Status". A red row indicates "Overdue (1)".

Design Exceptions

- Design Exceptions Approved for the Project

- Stopping Sight Distance (SSD) – 2 Locations;
Superelevation – 1 Location

- Location 1: West of 21st Ave. / Hillsboro Road Interchange
 - Full Design Standard req. 537 ft. SSD vs. 468 ft. SSD Existing
- Location 2: Belmont Blvd. Overpass
 - Full Design Standard req. 537 ft. SSD vs. 468 ft. SSD Existing
 - Std. Full SE req. 7.8 % vs. 6 % Existing

English TDOT - ROADWAY DESIGN GUIDELINES Revised: 10/27/15

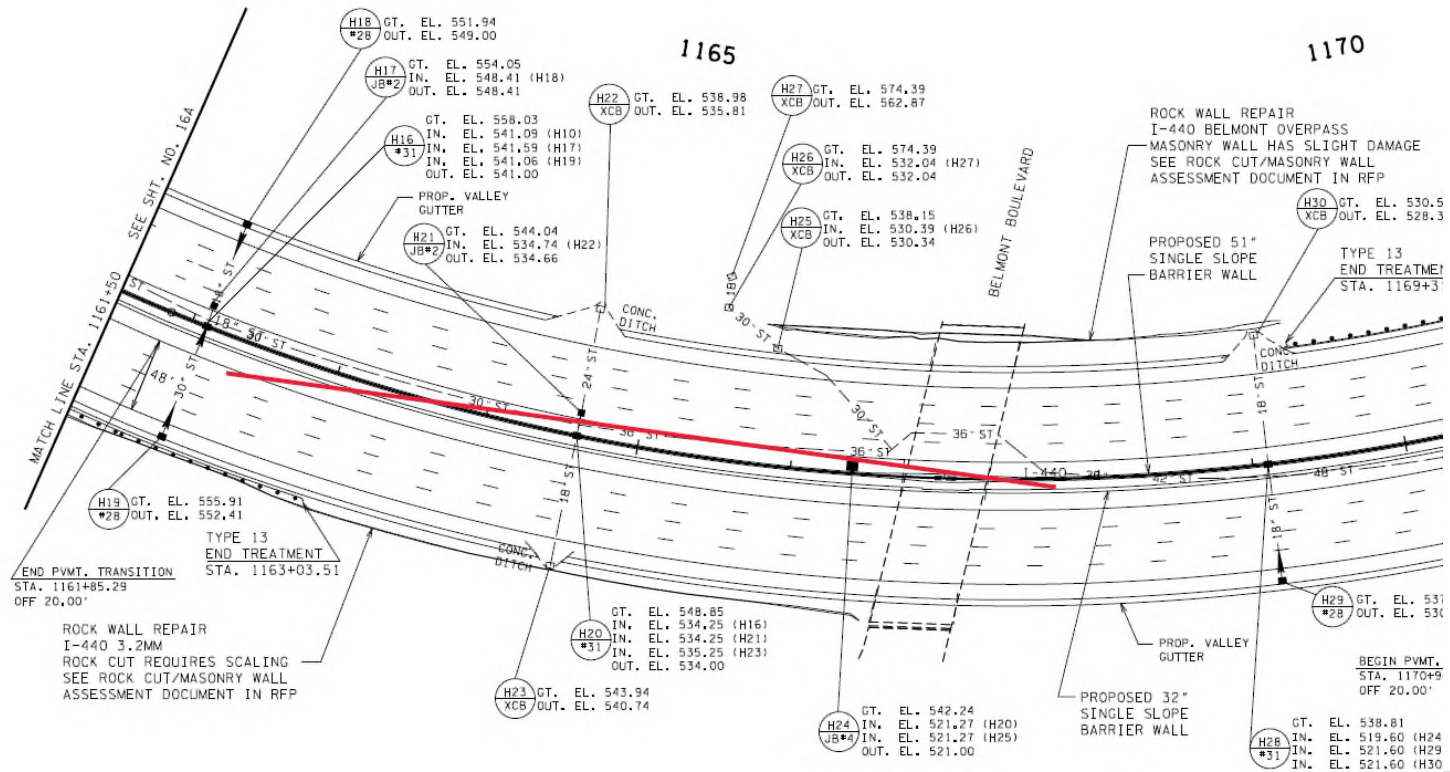


STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

ROADWAY DESIGN GUIDELINES

October 2015

Design Exceptions (Cont.'d)



Design - Other Requirements

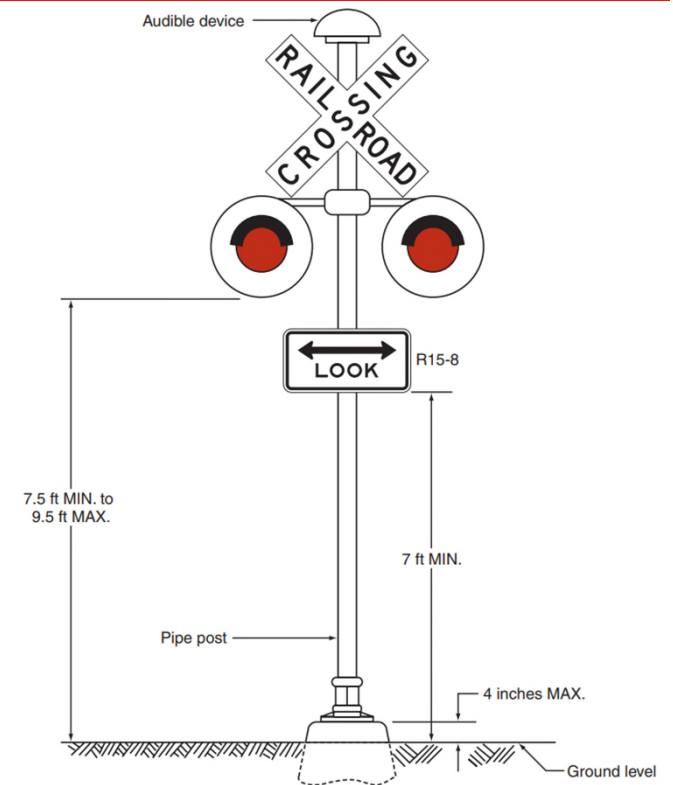
- Survey
 - Survey verified for accuracy by the Design-Builder.
- ROW
 - Constructed entirely within existing ROW. (Railroad Easements)
- Utility Coordination
 - Minor Conflicts able to be Mitigated in Design.
- Geotech
 - Roadway & Structure Investigations and Rockfall Mitigation
- Environmental Permits
 - Only required an NPDES permit (water quality).



Construction Challenges

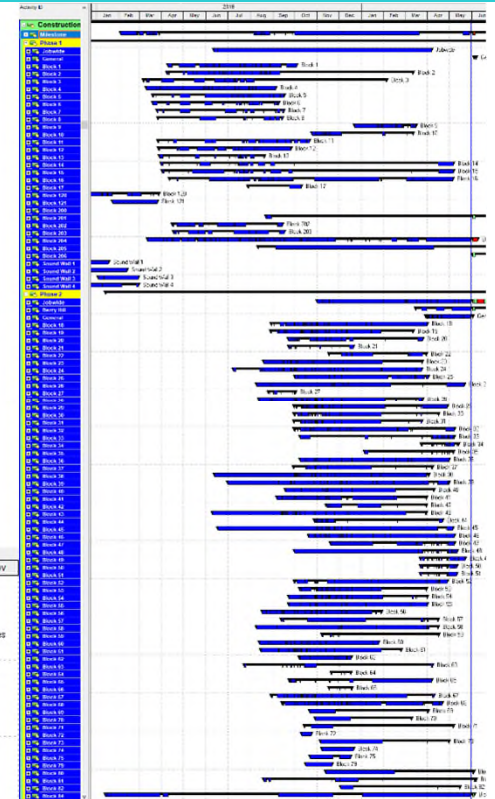
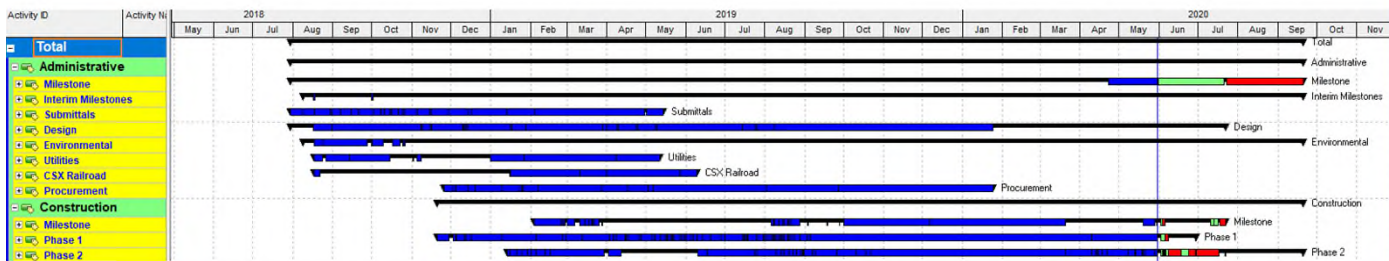
Summary of Challenges

- Construction Challenges Included:
 - Compressed Time
 - Materials
 - Structure – I-65 Flyover

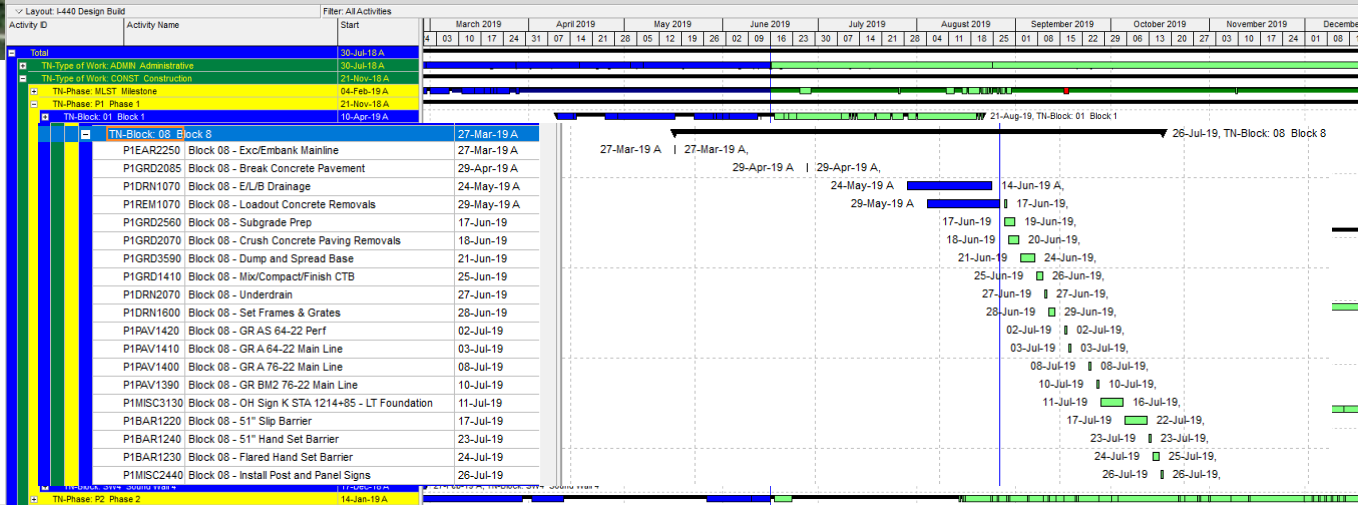
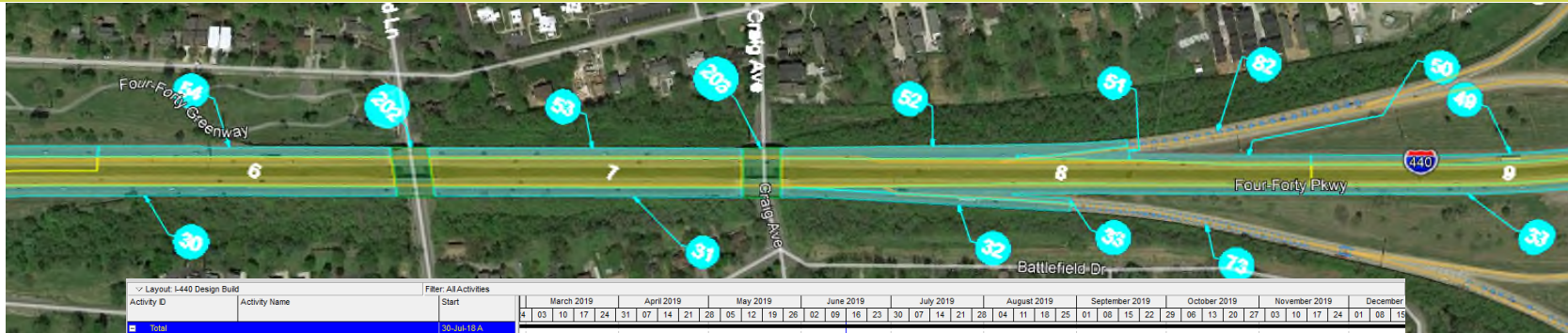


Schedule - Summary

- Timeline/Schedule
 - Early Work Begin: December 2018
 - First Major Traffic Shifts: March 2019
 - Phase 1 Complete: September 2019
 - Phase 2 Complete: May 2020
 - Project Complete: July 2, 2020 (Tentative)



Schedule - Organization

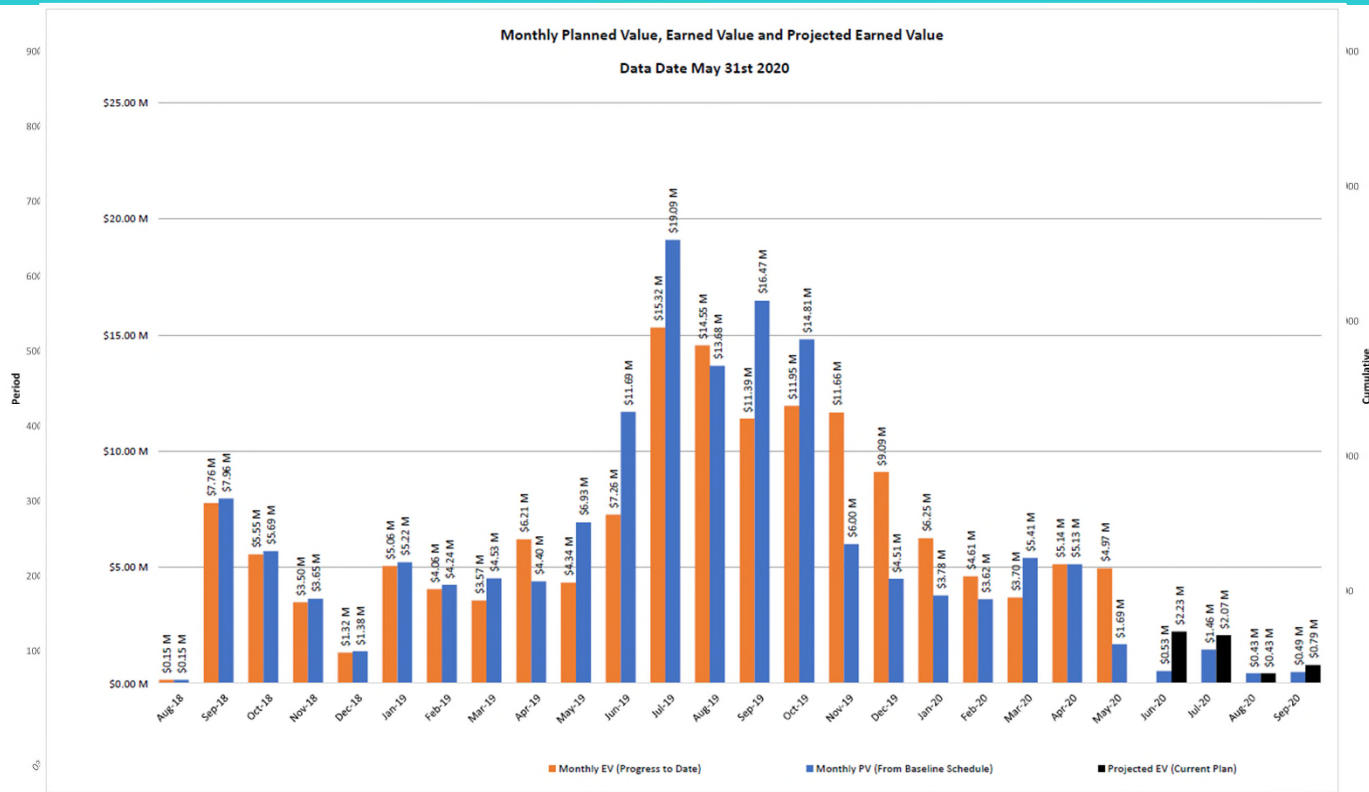


Schedule - Forces

- Prime Contractor
 - Peak Staff:
 - 45 Engineers/Staff
 - 150 Craft Personnel
- Subcontractors
 - 50+ Subcontractors
 - Design and Engineering, ITS/Lighting, Asphalt Paving, Traffic Control, Drainage, Concrete Work, Marking

Subcontractor Name	Type of Work
AFCO Steel	Steel Girders
Antigo Construction Inc	Concrete Demo
Badger Daylighting	Potholing
Bell & Associates	Bridge Widening
Campbell Construction	Rebar F&I
True-Line Coring & Cutting of TN, Inc	Saw Cutting
C&D Safety	Striping
Campbell & Ford Construction	Bridge Deck Repairs
Campbell Construction	Rebar Install
Creative Design Concepts	Concrete Barrier
Double EE Contractors LLC	Drainage
EJ Breneman	Cement Spreading
E3 Construction Company Inc.	Flatwork
Energy Construction Solutions	Potholing
F8TH Construction Company LLC	Guardrail Removal
Geostabilization International	Rockfall Mitigation
Gosalia	Concrete Paving
Great Lakes	H-Pile Material
Harper Construction LLC	Bridge Railing
Jabez Group Indeed	Rebar Supply
JB Pinnacle	Barrier Labor
Jerry B. Young Construction, Inc	On-site Material Haul
Jerry B. Young Construction, Inc	Drainage
K.S. Ware & Associates, LLC	Engineering
Kimberly, Inc.	Erosion Control
Lane Hauling & Excavating (ADEBCO)	Trucking
Liberty Waste	Chemical Toilets Service
Lolac	Potholing/Hydrovac
Long Foundation Drilling	Drilled Shafts
ProTech Coatings	Epoxy Overlay
Rembco	Drilled Shaft Repair
Rio Grande Fence Co.	Railroad Fencing
Saber Steel	Rebar Supply (Dowels)
Sentinel Construction	Guardrail
Southeast Grinding & Grooving	Grinding
Stansell Electric	ITS/Lighting
Edwards Supply	ITS/Lighting Supply
Superior Traffic Control, LLC (Early Work)	Traffic Control
Superior Traffic Control, LLC	Traffic Control
Sweeping Corporation of America, Inc	Street Sweeping
Sweeping Corporation of America, Inc	Video Inspection
Tennessee Guardrail	Guardrail
Tennessee Texture	Coatings
TKM Inc	Barrier Supply
Tom Arnold Construction Co	Underdrain
Trojan Labor	Labor
True-Line Coring & Cutting of TN, Inc	Saw Cutting
Vortex Services	Pipe Repair
Vulcan Construction Materials, LLC	Supply Asphalt/Base
Vulcan Construction Materials, LLC	Asphalt Paving
Jerry B. Young Construction, Inc	Asphalt Binder
The WMC Contracting Co., Inc	Asphalt Binder
Wilson & Associates	Surveying
WSP USA, Inc	Engineering
K.S. Ware & Associates, LLC	Engineering
Civil Infrastructure Associates, LLC	Engineering

Schedule - Finances

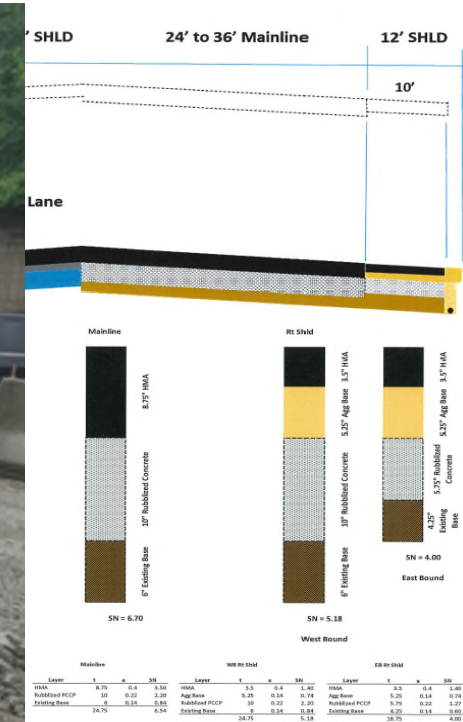


Schedule - Progression



Material - Rubblization

- ACS MIX (PG76-22)
 - 1.25 inches thick
- AC MIX (PG76-22)
 - 2.5 – 3.5 inches thick
- AC MIX (PG76-22)
 - 4.0 inches thick
- Rubblized Concrete
 - 10.0 inches thick
- Existing CTB Base
 - 6.0 inches thick



Material – RCA



Structure – I-65 Flyover



Structure – I-65 Flyover



Structure – I-65 Flyover



Structure – I-65 Flyover



Further Project Information



Reconstruction

P R O J E C T

WWW.TN.GOV/TDOT/PROJECTS/REGION-3/INTERSTATE-440



Questions?

Thank you!

