

# Case Study of MD 210 Overlay

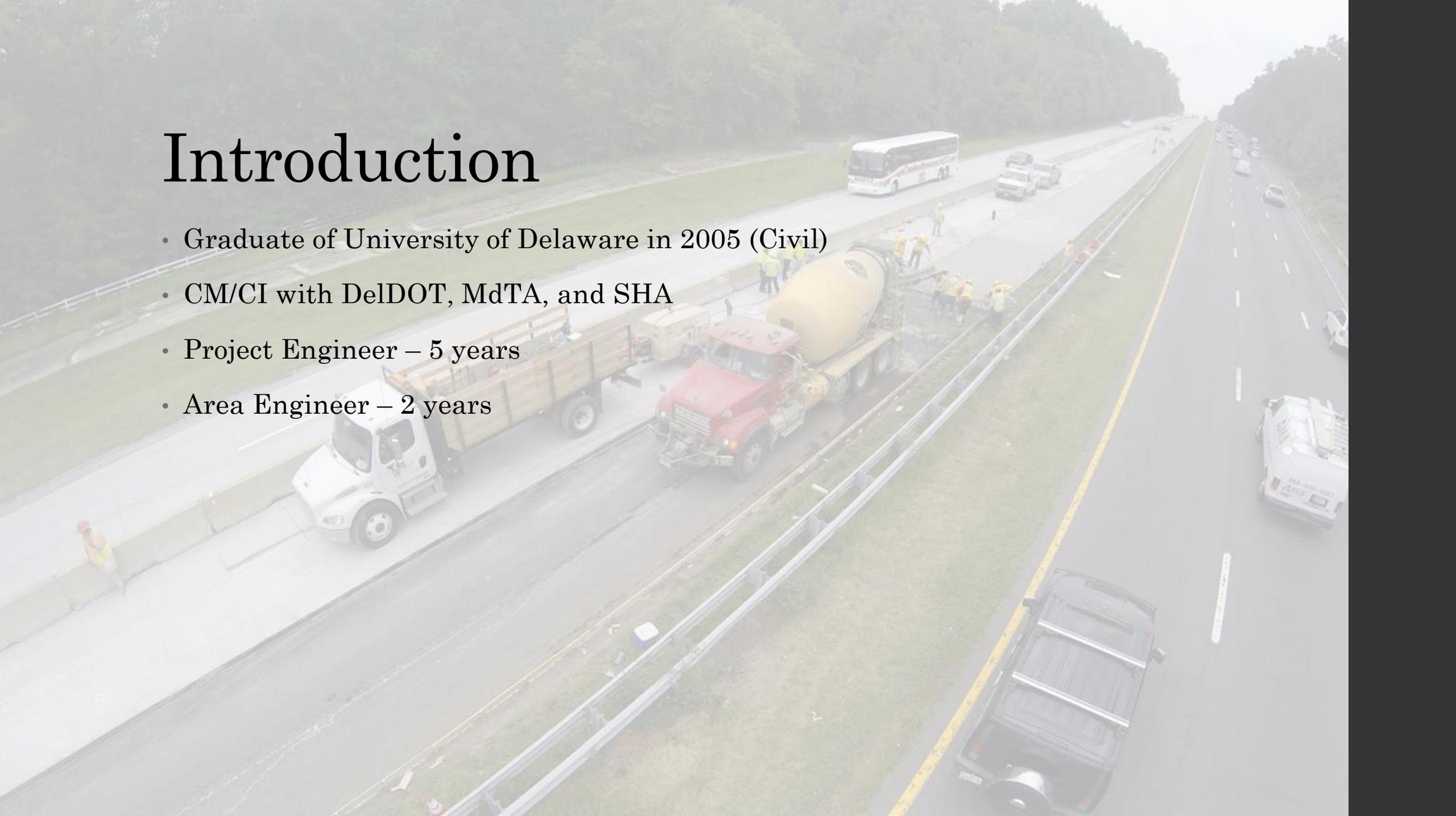
Kevin Oberheim, PE, CCM

February 10, 2016

Mid-Atlantic Quality Assurance Workshop

# Introduction

- Graduate of University of Delaware in 2005 (Civil)
- CM/CI with DelDOT, MdTA, and SHA
- Project Engineer – 5 years
- Area Engineer – 2 years

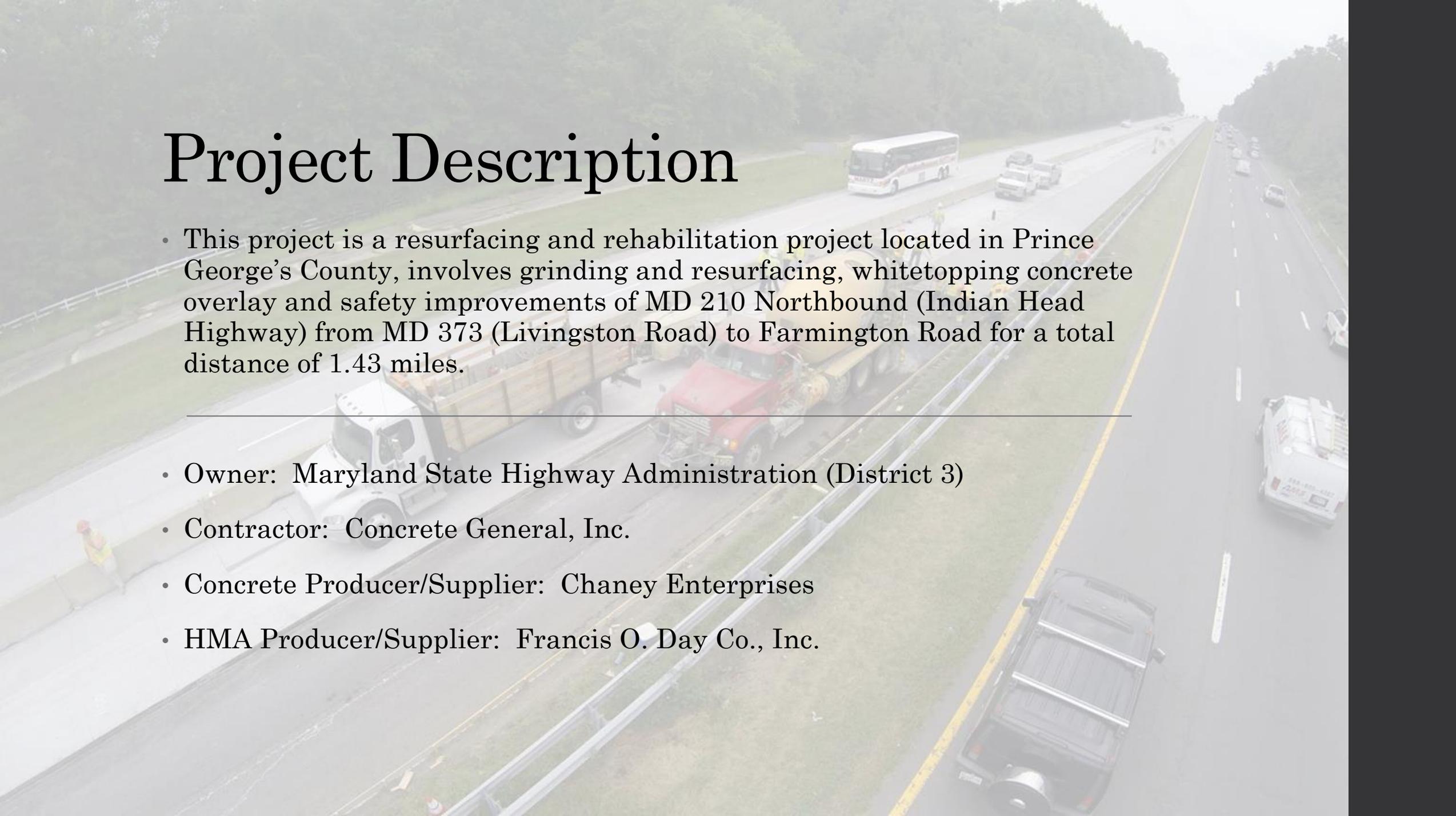


# Agenda

- Project Description and Location
- Project Scope
- Purpose and Need
- Design Challenges
- MOT Challenges
- Construction Challenges
- Results



# Project Description



- This project is a resurfacing and rehabilitation project located in Prince George's County, involves grinding and resurfacing, whitetopping concrete overlay and safety improvements of MD 210 Northbound (Indian Head Highway) from MD 373 (Livingston Road) to Farmington Road for a total distance of 1.43 miles.
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- Owner: Maryland State Highway Administration (District 3)
  - Contractor: Concrete General, Inc.
  - Concrete Producer/Supplier: Chaney Enterprises
  - HMA Producer/Supplier: Francis O. Day Co., Inc.

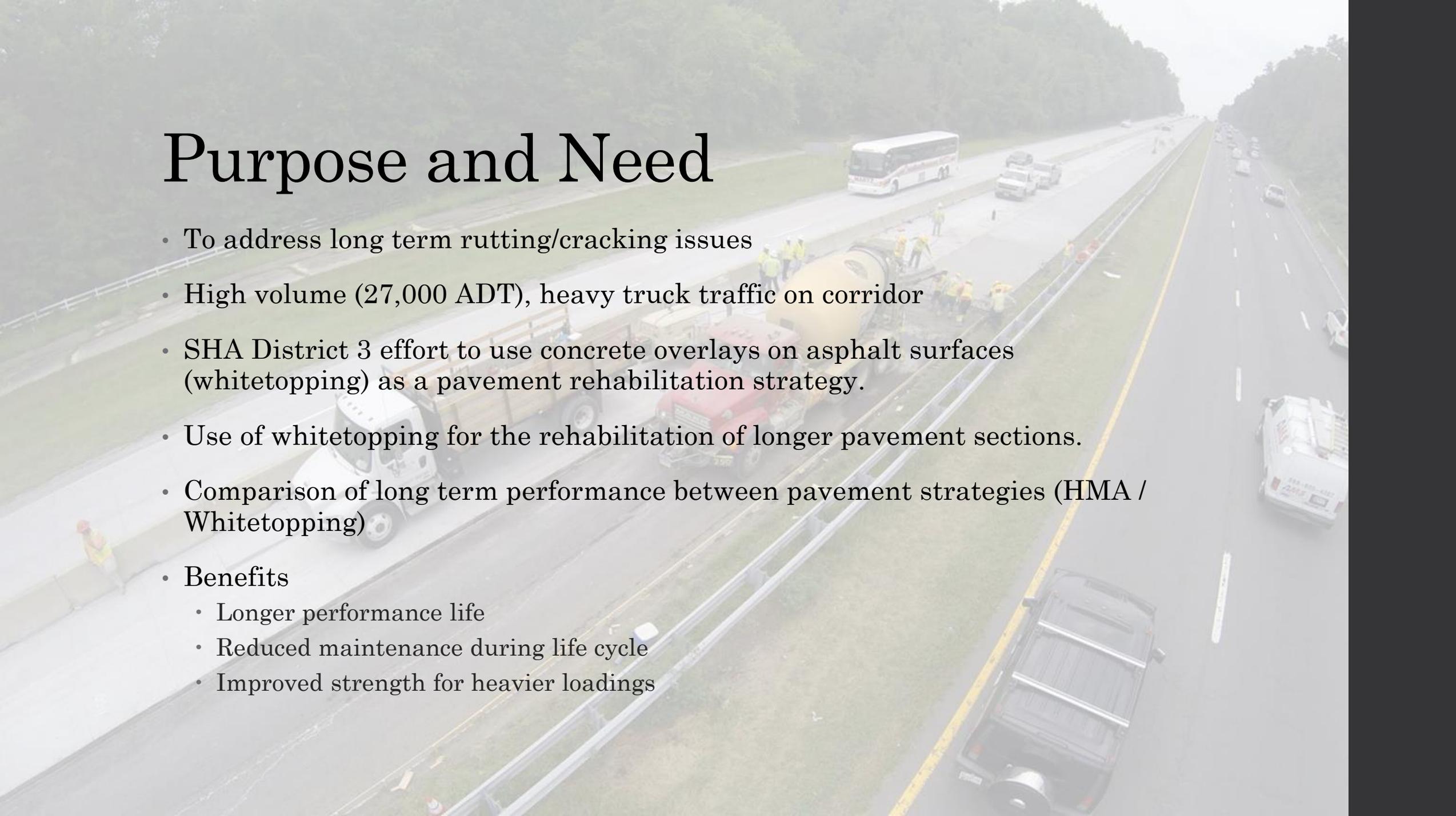


# Project Scope

- 4" HMA removed
- 6" Whitetopping overlay
- 4400 LF (25,600 SY) of whitetopping overlay
- 3,100 LF of HMA (2,700 LF approach, 400 LF exit)
- 2,250 Tons of HMA overlay
- 14,000 LF of guardrail replacement
- \$3.07 million



# Purpose and Need

An aerial photograph of a multi-lane highway under construction. A large concrete mixer truck is positioned in the center of the road, surrounded by several workers in high-visibility vests. To the left, a white truck is parked. To the right, a dark SUV is driving. In the background, a white bus and several cars are visible on the highway. The road is bordered by green trees and a grassy area.

- To address long term rutting/cracking issues
- High volume (27,000 ADT), heavy truck traffic on corridor
- SHA District 3 effort to use concrete overlays on asphalt surfaces (whitetopping) as a pavement rehabilitation strategy.
- Use of whitetopping for the rehabilitation of longer pavement sections.
- Comparison of long term performance between pavement strategies (HMA / Whitetopping)
- Benefits
  - Longer performance life
  - Reduced maintenance during life cycle
  - Improved strength for heavier loadings



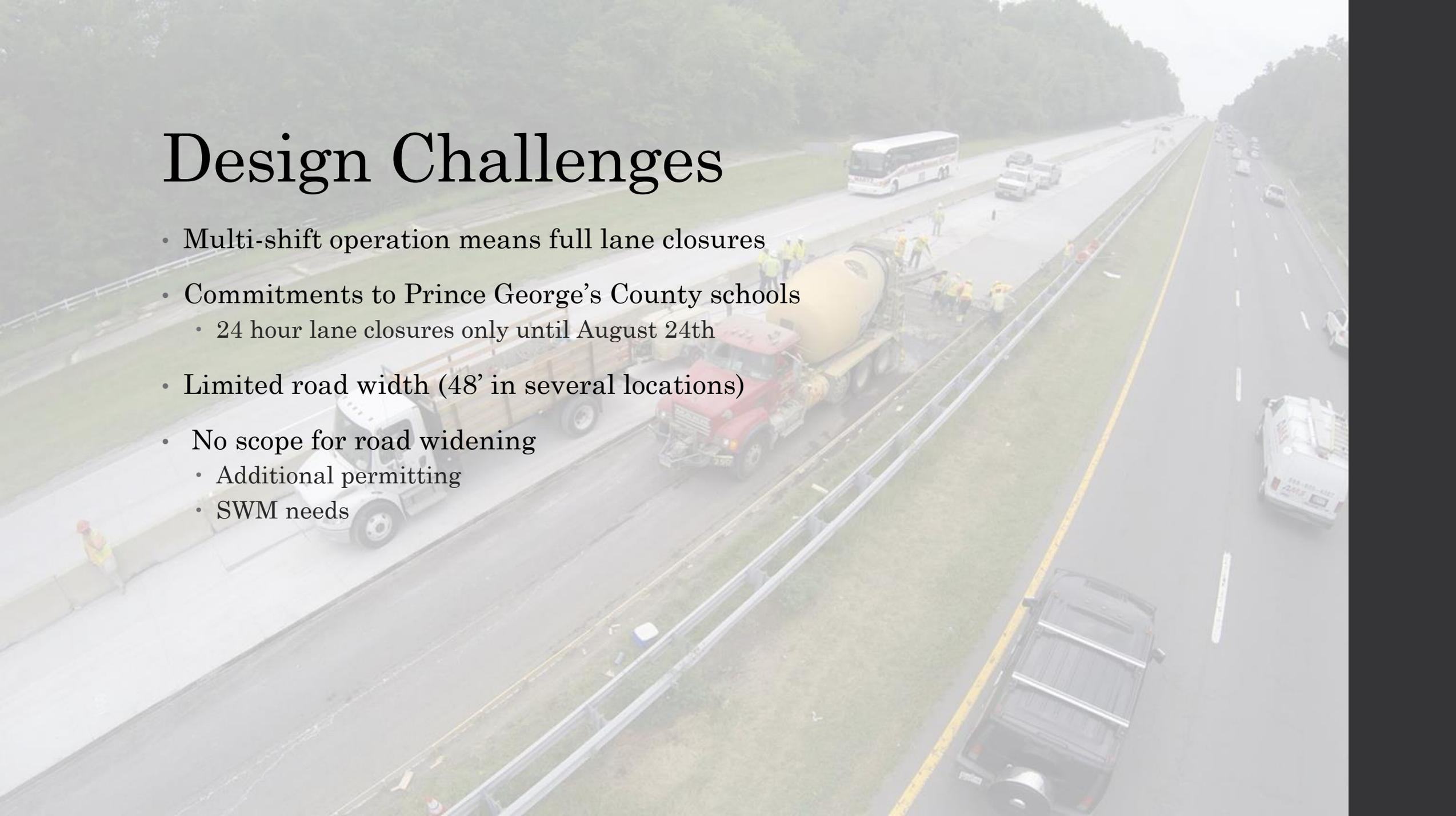


# Project Selection

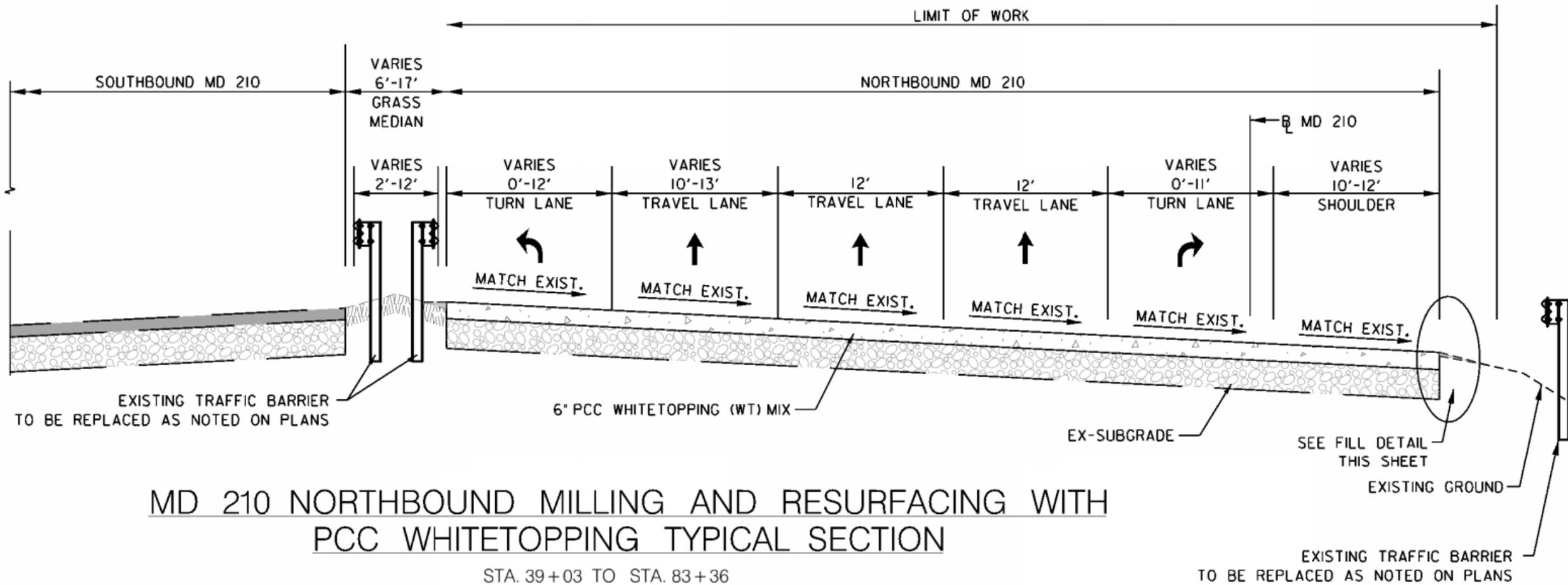
- Criteria
  - Minimum 48' road width for Maintenance of Traffic
  - Bearing shoulders for Maintenance of Traffic
  - Existing minimum of 10" of HMA
- Study of long term performance for longer pavement sections
- Maintenance of Traffic solutions



# Design Challenges

An aerial photograph of a highway construction site. A red concrete mixer truck is positioned in the center of the frame, surrounded by several workers in high-visibility vests. To the left, a white truck is parked. In the background, a white bus and other vehicles are visible on the road. The road is bordered by a metal guardrail and a grassy area. The overall scene depicts a busy construction environment on a multi-lane highway.

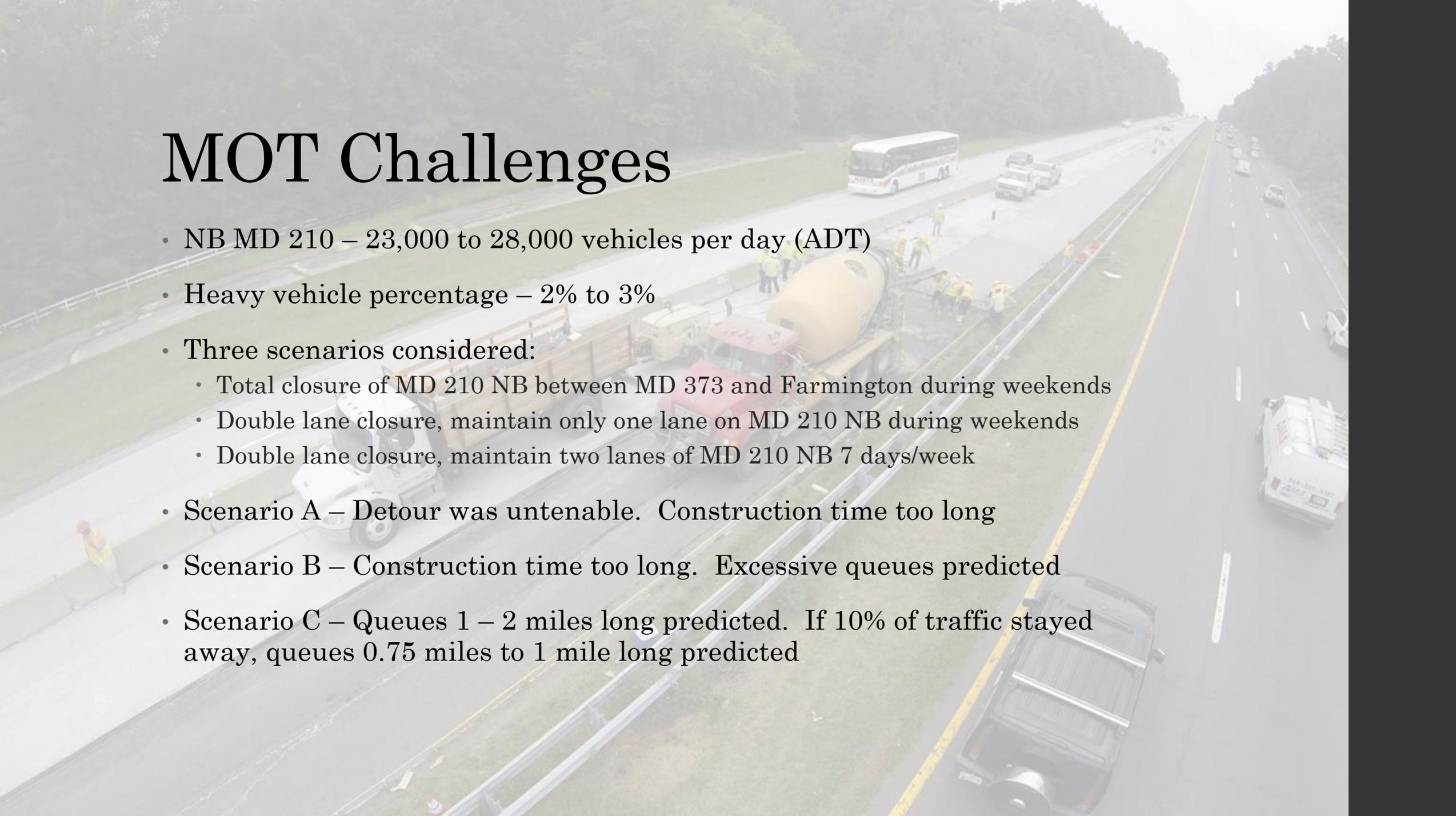
- Multi-shift operation means full lane closures
- Commitments to Prince George's County schools
  - 24 hour lane closures only until August 24th
- Limited road width (48' in several locations)
- No scope for road widening
  - Additional permitting
  - SWM needs



## MD 210 NORTHBOUND MILLING AND RESURFACING WITH PCC WHITETOPPING TYPICAL SECTION

STA. 39+03 TO STA. 83+36

# MOT Challenges

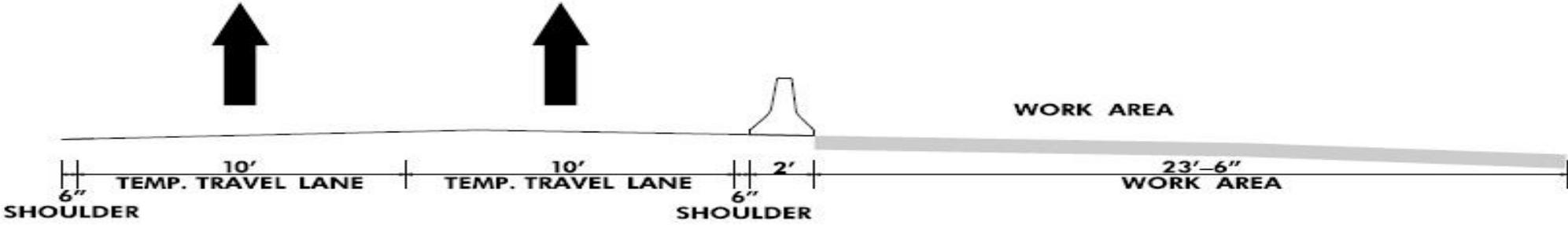
An aerial photograph of a multi-lane highway under construction. A large yellow cement mixer truck is positioned in the center of the road, surrounded by several construction workers in high-visibility vests. To the left, a white pickup truck is parked. To the right, a white bus and several cars are visible. The road is flanked by green trees and a clear sky.

- NB MD 210 – 23,000 to 28,000 vehicles per day (ADT)
- Heavy vehicle percentage – 2% to 3%
- Three scenarios considered:
  - Total closure of MD 210 NB between MD 373 and Farmington during weekends
  - Double lane closure, maintain only one lane on MD 210 NB during weekends
  - Double lane closure, maintain two lanes of MD 210 NB 7 days/week
- Scenario A – Detour was untenable. Construction time too long
- Scenario B – Construction time too long. Excessive queues predicted
- Scenario C – Queues 1 – 2 miles long predicted. If 10% of traffic stayed away, queues 0.75 miles to 1 mile long predicted

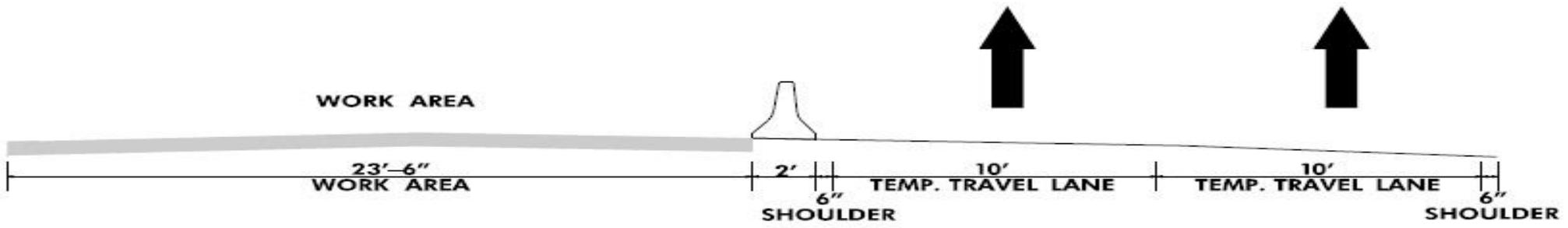
# MOT Challenges

- Scenario C was selected in spite of the queuing risk
- Construction time predicted was the shortest – About 3 to 4 weeks
- PR Campaign involved press releases from SHA and fliers to the local community
- Actual queues were much less than predicted
- Combined width during the construction is only 20' – 21' wide
- Phase I – right most through lane and shoulder to be closed. Maintain the two inside through lanes.
- Phase II – Inside two through lanes close. Traffic on shoulder and right most through lane
- Placement of the construction barrier, which occupies 2' was a challenge

# MOT Challenges



NORTHBOUND MD 201  
PHASE 1 CONSTRUCTION



NORTHBOUND MD 201  
PHASE 2 CONSTRUCTION

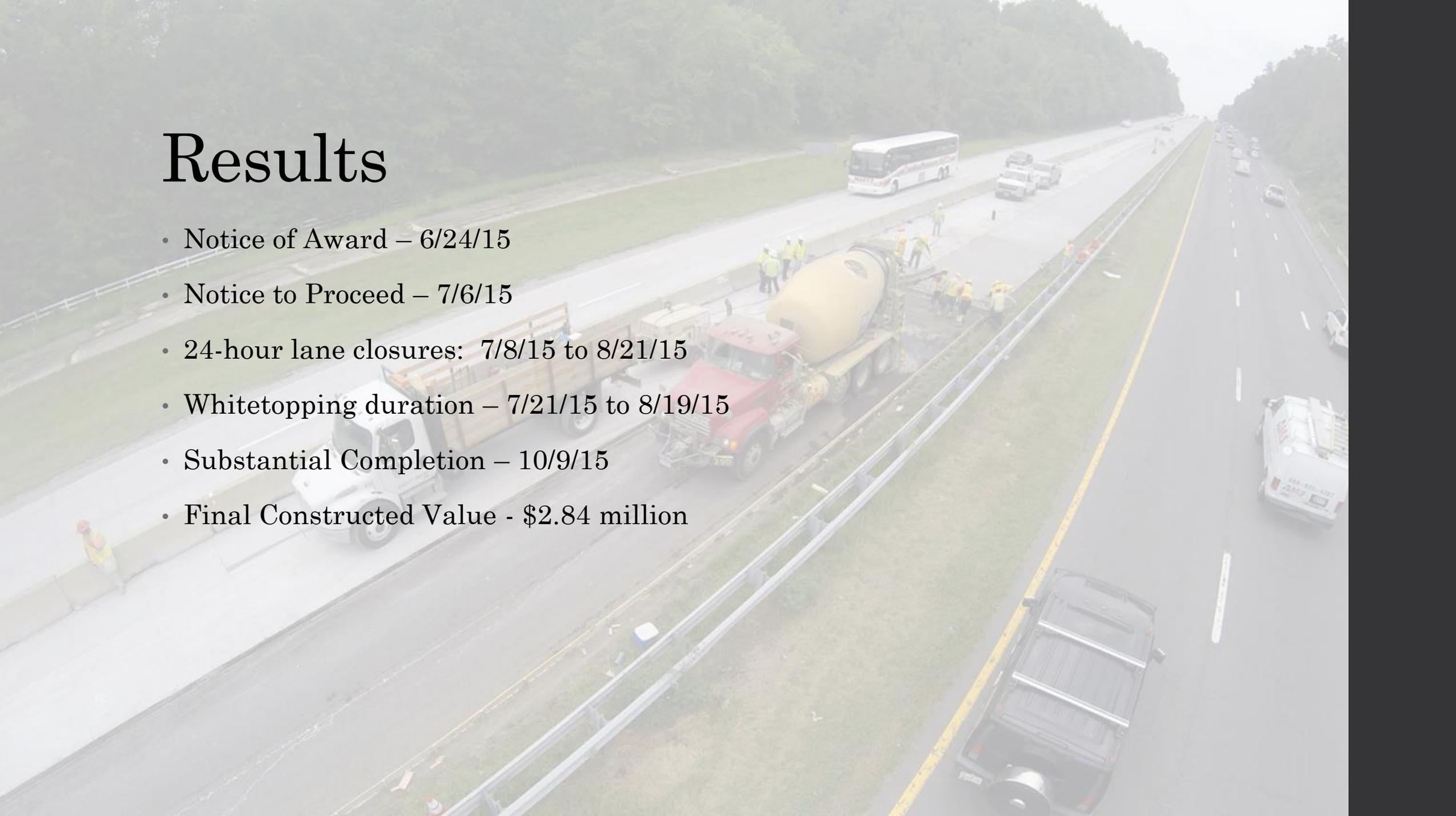
# Construction Challenges

An aerial photograph of a highway construction site. A red concrete mixer truck is positioned on a newly poured concrete surface. Several workers in high-visibility vests are standing around the truck. To the left, a white truck with a wooden bed is parked. In the background, a white bus and other vehicles are visible on the highway. The road is bordered by a metal guardrail and a grassy area. The sky is overcast.

- Tight schedule
- Limited road width
- Congestion
- Unknown subgrade condition

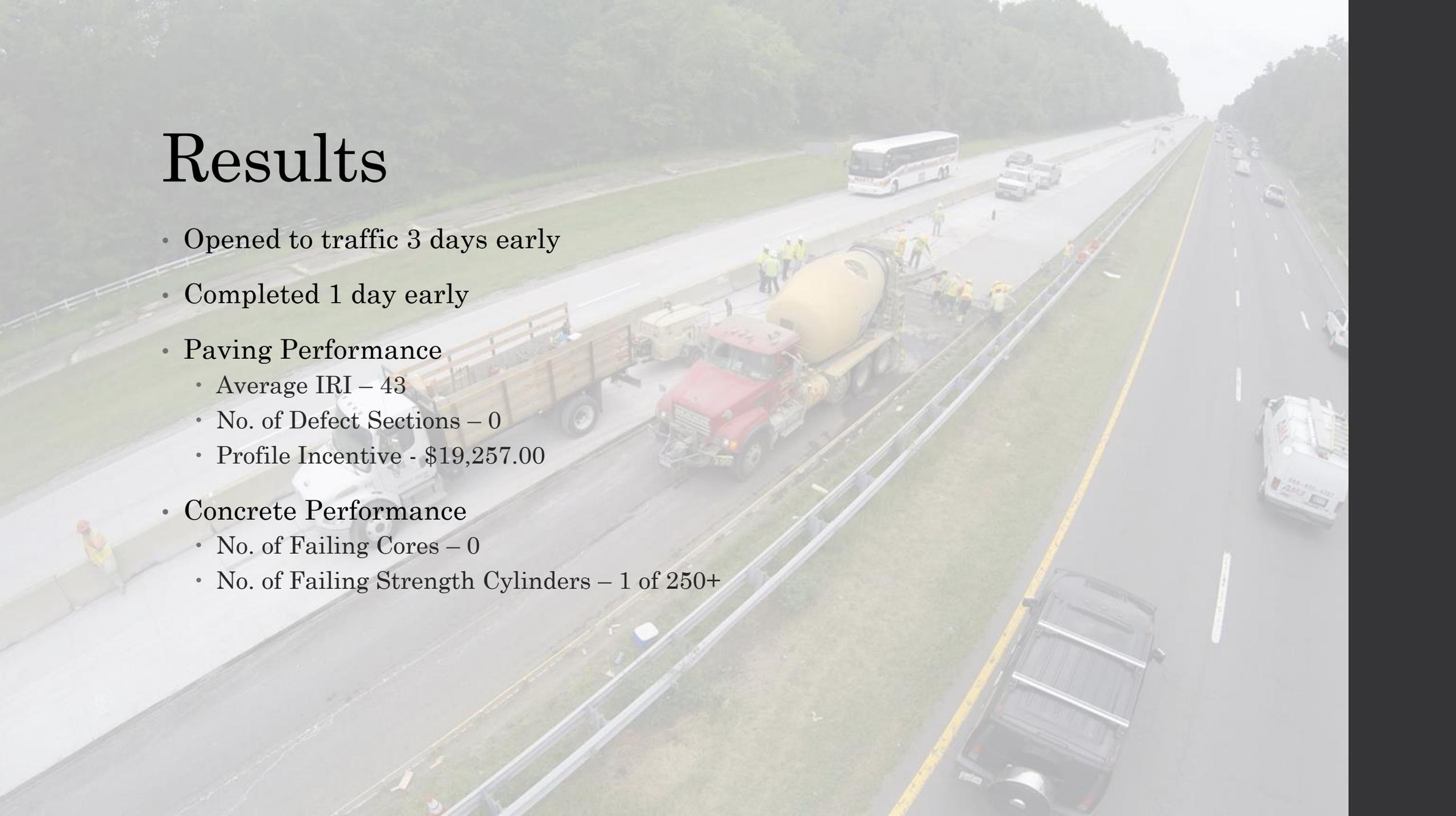
# Results

- Notice of Award – 6/24/15
- Notice to Proceed – 7/6/15
- 24-hour lane closures: 7/8/15 to 8/21/15
- Whitetopping duration – 7/21/15 to 8/19/15
- Substantial Completion – 10/9/15
- Final Constructed Value - \$2.84 million



# Results

- Opened to traffic 3 days early
- Completed 1 day early
- Paving Performance
  - Average IRI – 43
  - No. of Defect Sections – 0
  - Profile Incentive - \$19,257.00
- Concrete Performance
  - No. of Failing Cores – 0
  - No. of Failing Strength Cylinders – 1 of 250+















# Recognition

- SHA Design Manager – Angela Strevig (WRA)
- SHA Pavement Engineer – Shekhar Murkute (SHA)
- SHA Project Engineer – David Jackson (RK&K)
- Contractor's Project Manager – Chris Kirsch (CGI)
- Contractor's Superintendent – Larry Smith (CGI)



# Questions?

## Contact Information

- Kevin Oberheim (SHA D3 Construction) – [koberheim@sha.state.md.us](mailto:koberheim@sha.state.md.us) or 301-513-7372
- Shekhar Murkute (SHA OMT) – [smurkute@sha.state.md.us](mailto:smurkute@sha.state.md.us) or 443-572-5074
- Venu Nemani (SHA D3 Traffic) – [vnemani@sha.state.md.us](mailto:vnemani@sha.state.md.us) or 301-513-7404