

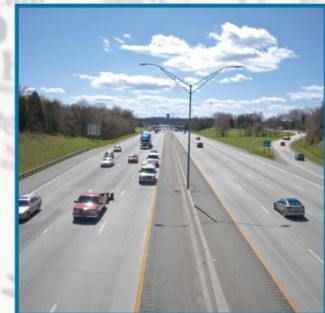
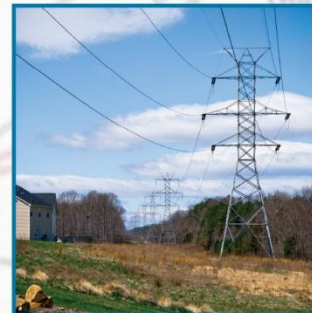
# DESIGN-BUILD



## MODIFICATION OF THE I-485 / I-85 INTERCHANGE

TIP # R-2123CE

**LANE**



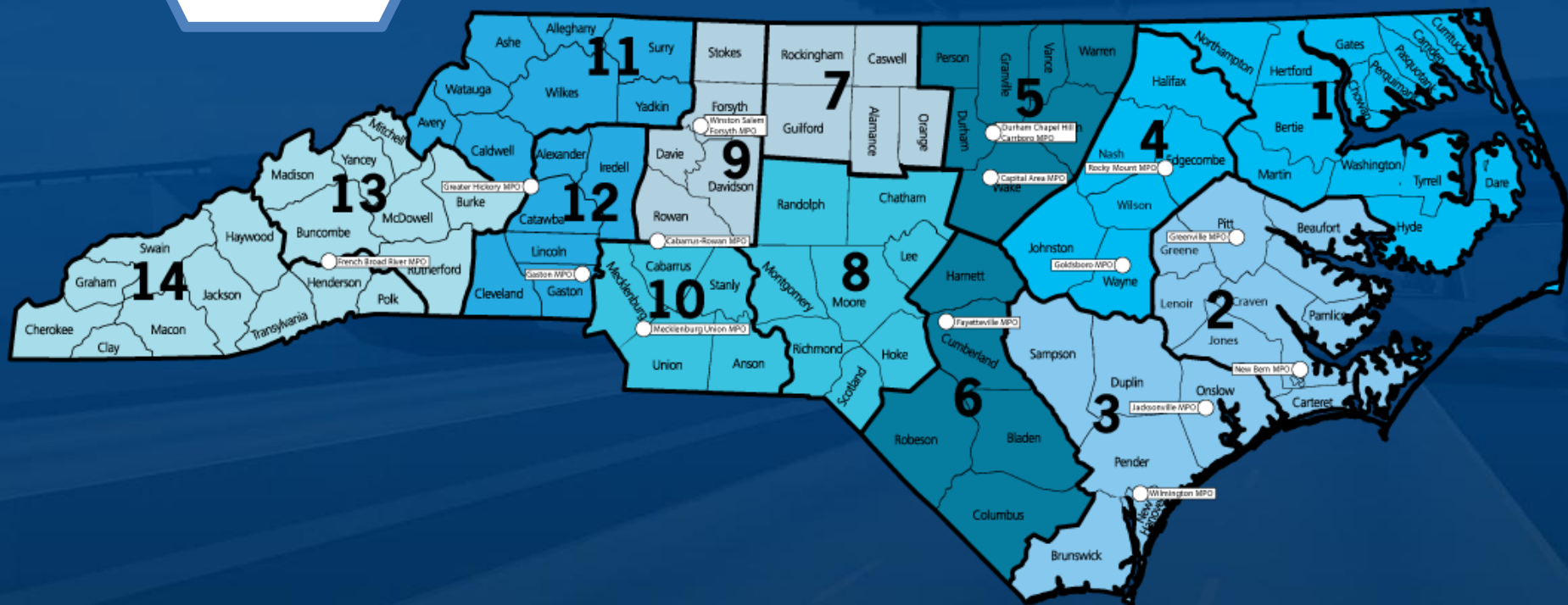
Presented By

Davis Diggs, P.E. – NCDOT  
Mike Grey – Lane Construction

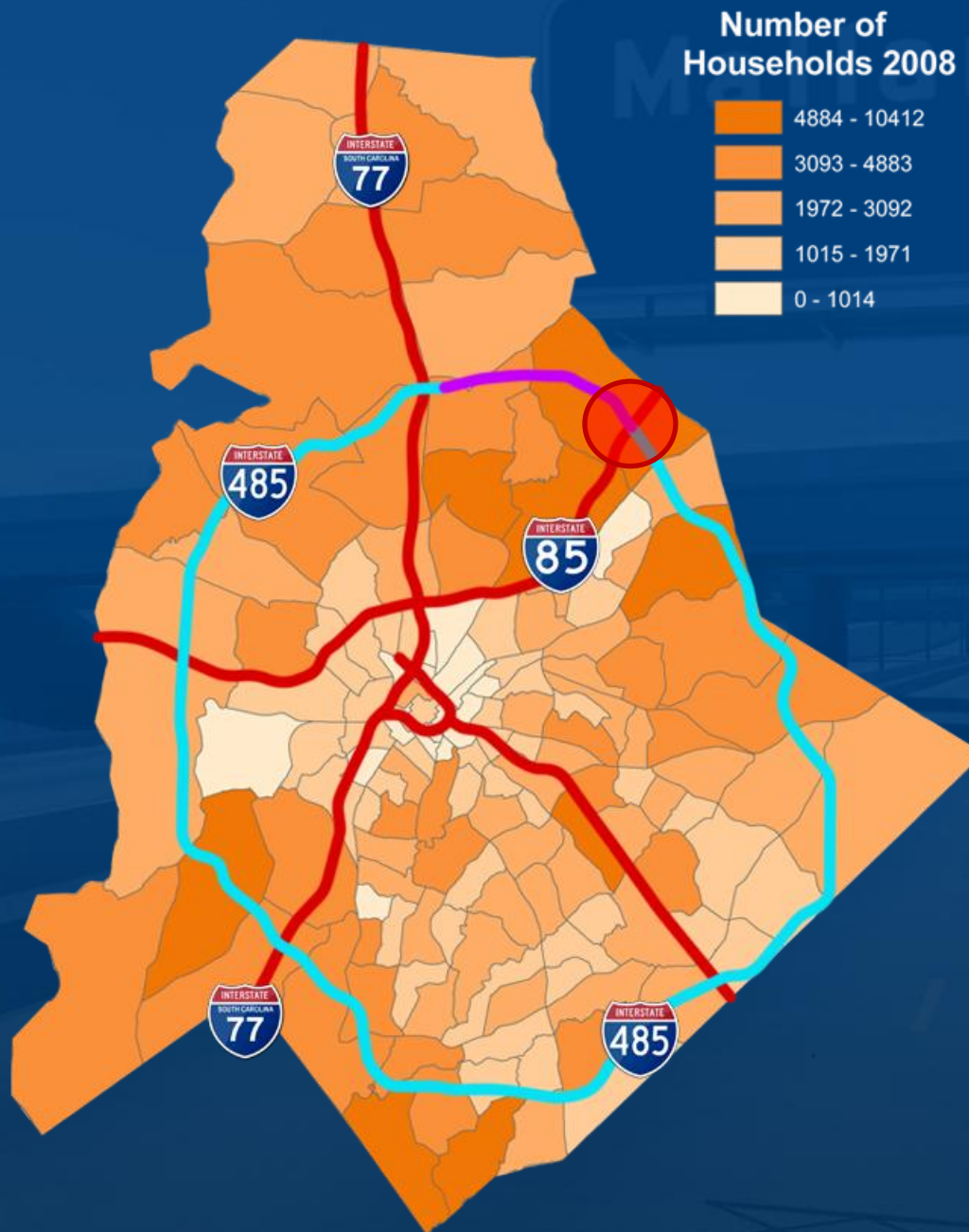
March 11, 2014



# NCDOT regions & divisions

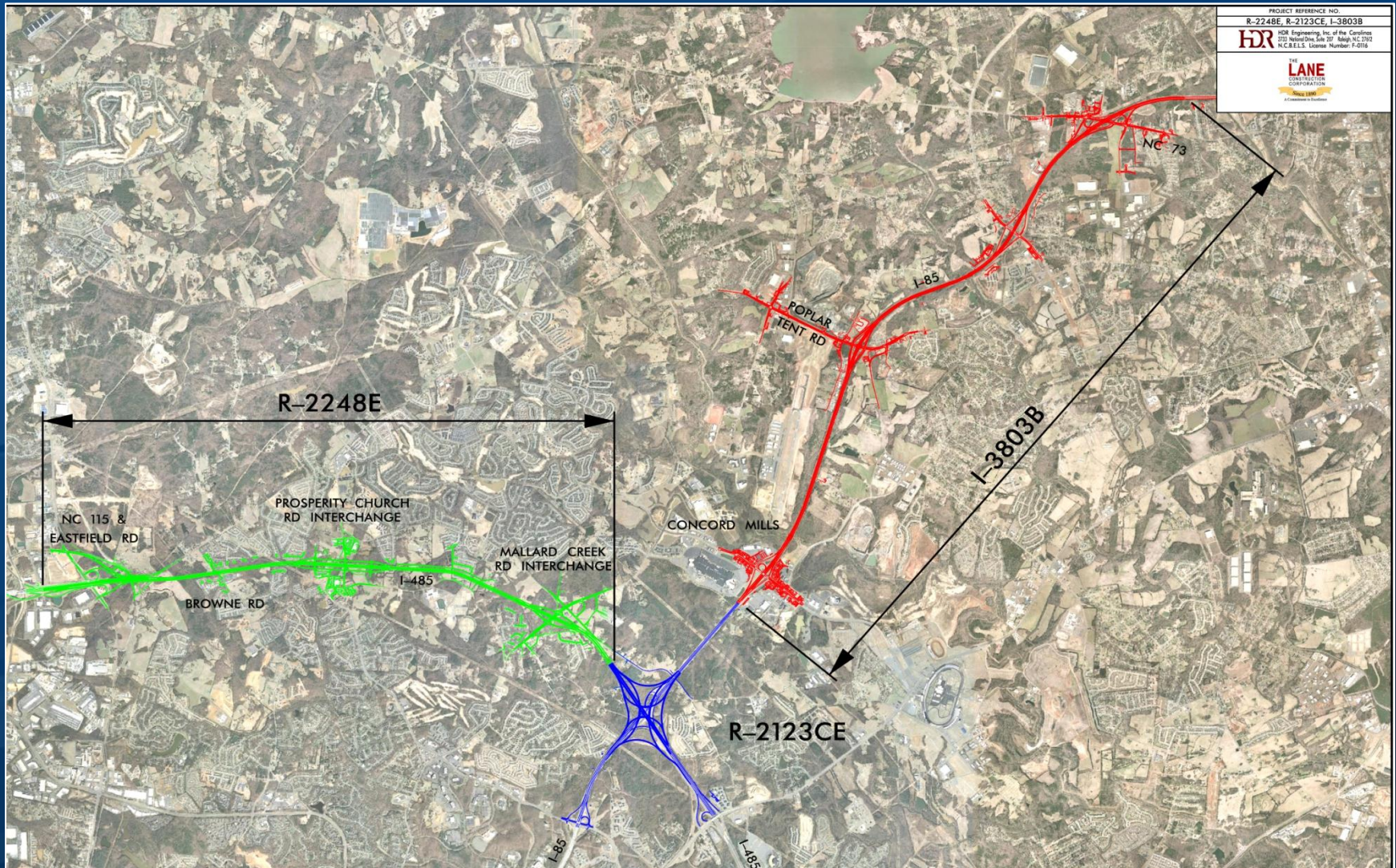


# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties





# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties



## The Big Three! - \$400m Contract Value



# R-2248E I-485 Outer Loop

## Project Highlights

- Completes Charlotte Outer Loop
- Split Diamond Interchange
- Diverging Diamond Interchange
- 20 Bridges, 2 Box Culverts
- 2.8 Million CY Material \$140 M



# I-3803B

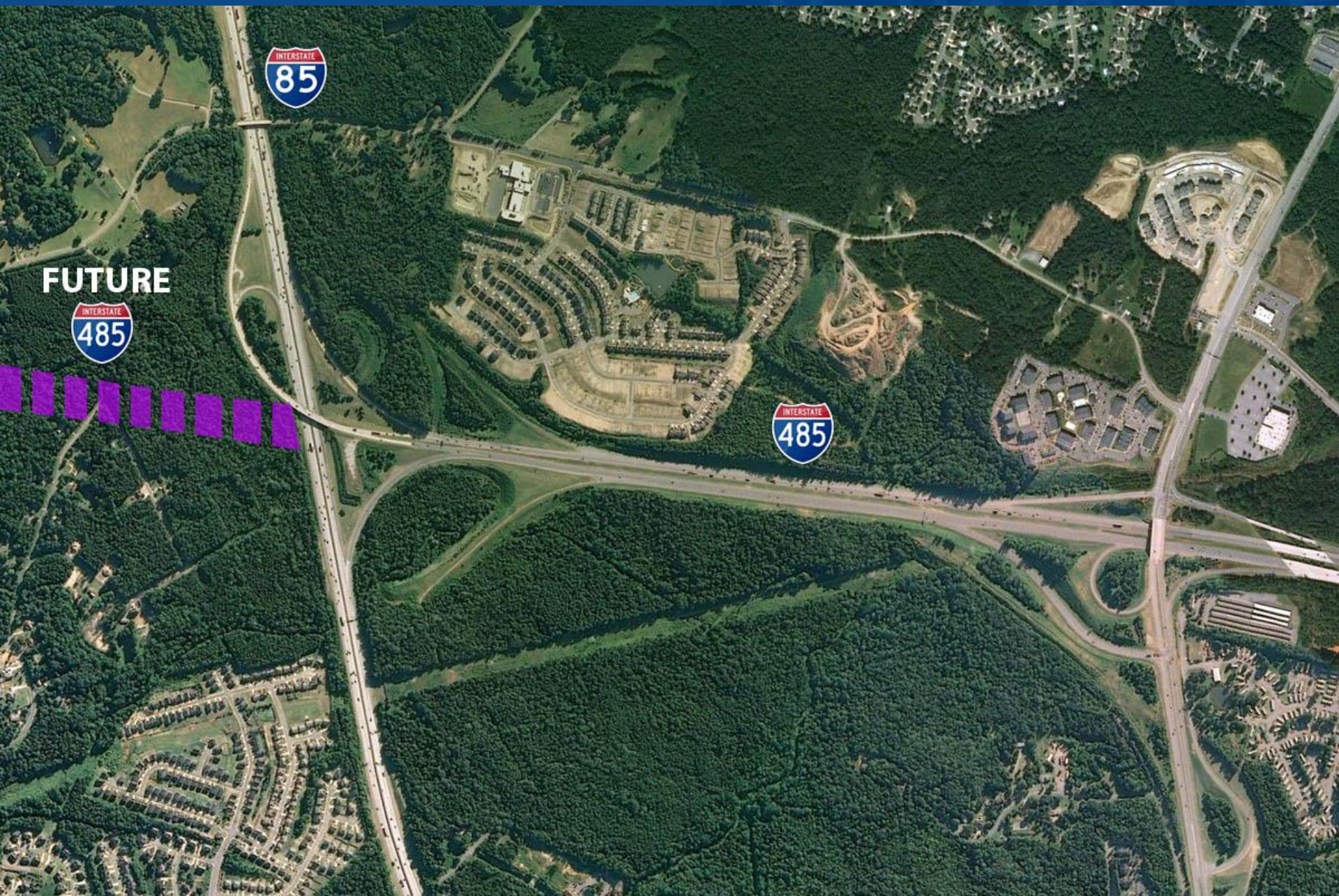
## I-85 from Bruton Smith Blvd. to NC 73

- ❖ Widens 7 mi. of I-85 to 8-lanes
- ❖ Innovative Design Features for Interchanges at Poplar Tent Rd & NC 73
- ❖ Lane Construction/HDR submitted winning price proposal @ \$125,159,110
- ❖ Construction began August 2011
- ❖ Completion scheduled for September, 2014





# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties





# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties







Modified Half Clover design  
From the 1980's



# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties





# 4 Level Stack Challenges



*2,000,000 Yards of Borrow*



## 4 Level Stack Challenges

- High Bridges Over Heavy Traffic
- Traffic Restrictions
- Girder Erection/Splices Over Traffic
- Tall MSE Walls
- Stability Issues/Heavy Falsework Potential
- Existing Interchange Conflicts
  - MOT Requires Out of Sequence Bridge Construction
  - Bridge Construction Sequence Restricts Crane Access

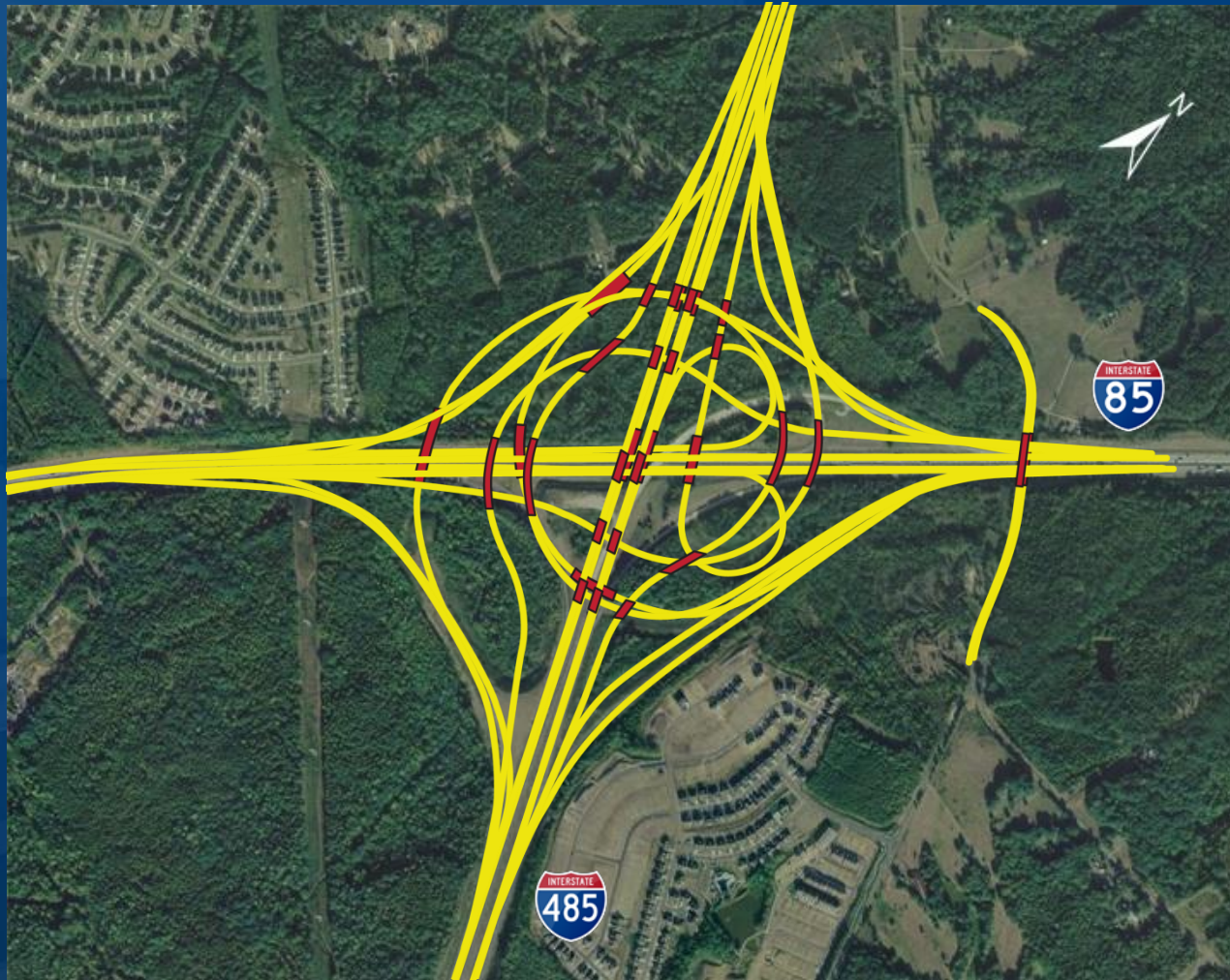


# Lane/STV Approach



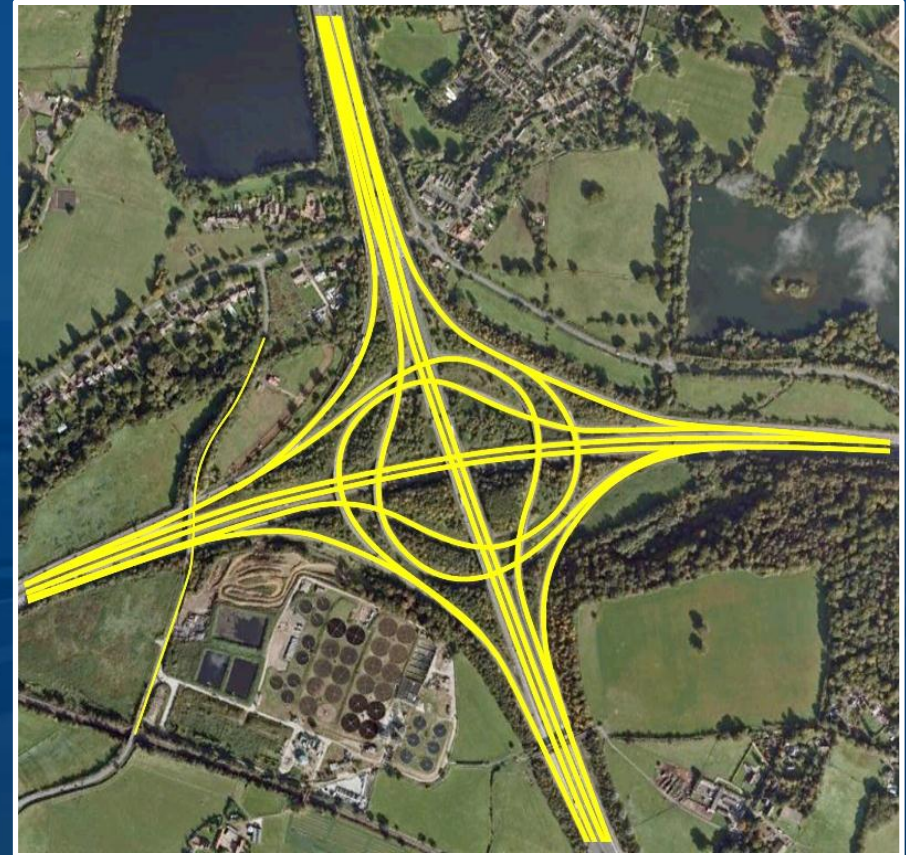
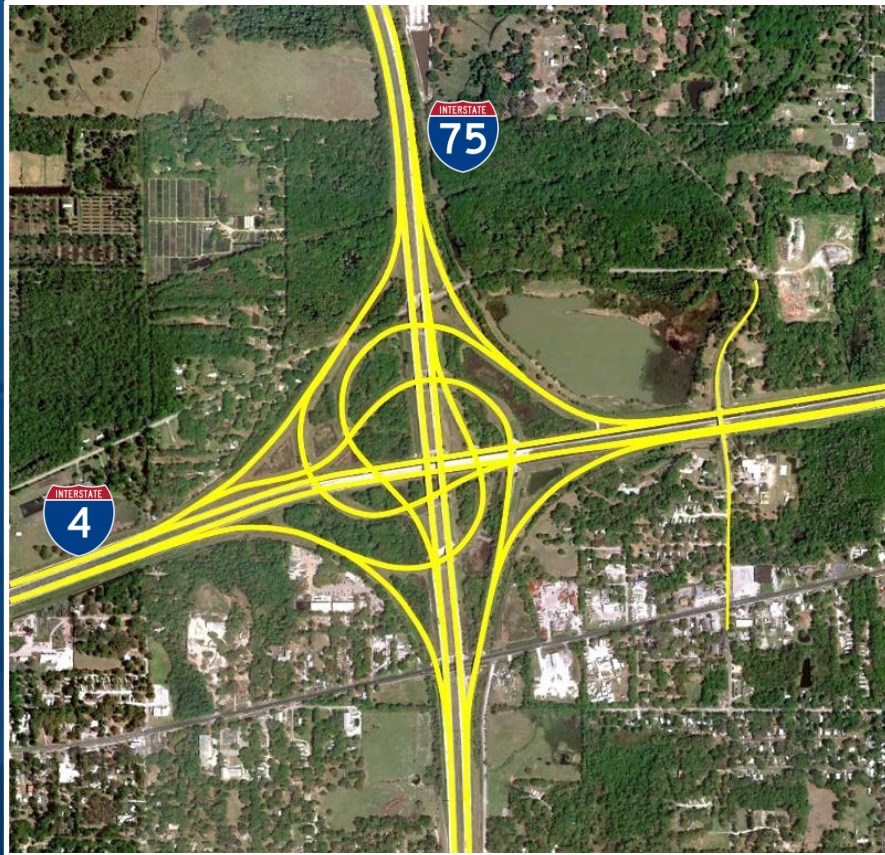


# Interchange Design





# Similar Turbine Interchanges



*Tampa, FL (left) and Thorpe, UK (right)*



# Advantages of 2-Level Turbine

- Simpler Construction w/Smaller Bridges
- Most Work “In the Clear”
- Flatter Roadway Profiles
- Much Less Earthwork
- Smaller MSE Walls
- Ease of Future Widening



*Modified Clover Interchange I-85 and I-485  
(18 miles south of R2123-CE site),  
built by Lane/Rea for NCDOT*



# Environmental Stewardship

- Wetlands Impacts the Same
- Streams Impacts Less
- Potential FEMA Impacts Minimized
- Impacts to Schweinitz's Sunflower Habitat Reduced





# Structures

## 19 New Bridges

- 10 are Single-Span
- Smaller Spans/Bents
- 18 of 19 Bridges are PC Girders
- *NO high-level, long span bridges*
- *Smaller columns*

## Simple to Build & Maintain

- *Standard Construction*
- *Standard Girder Erection*
- *No Post Tensioning*
- *No Complex Falsework*

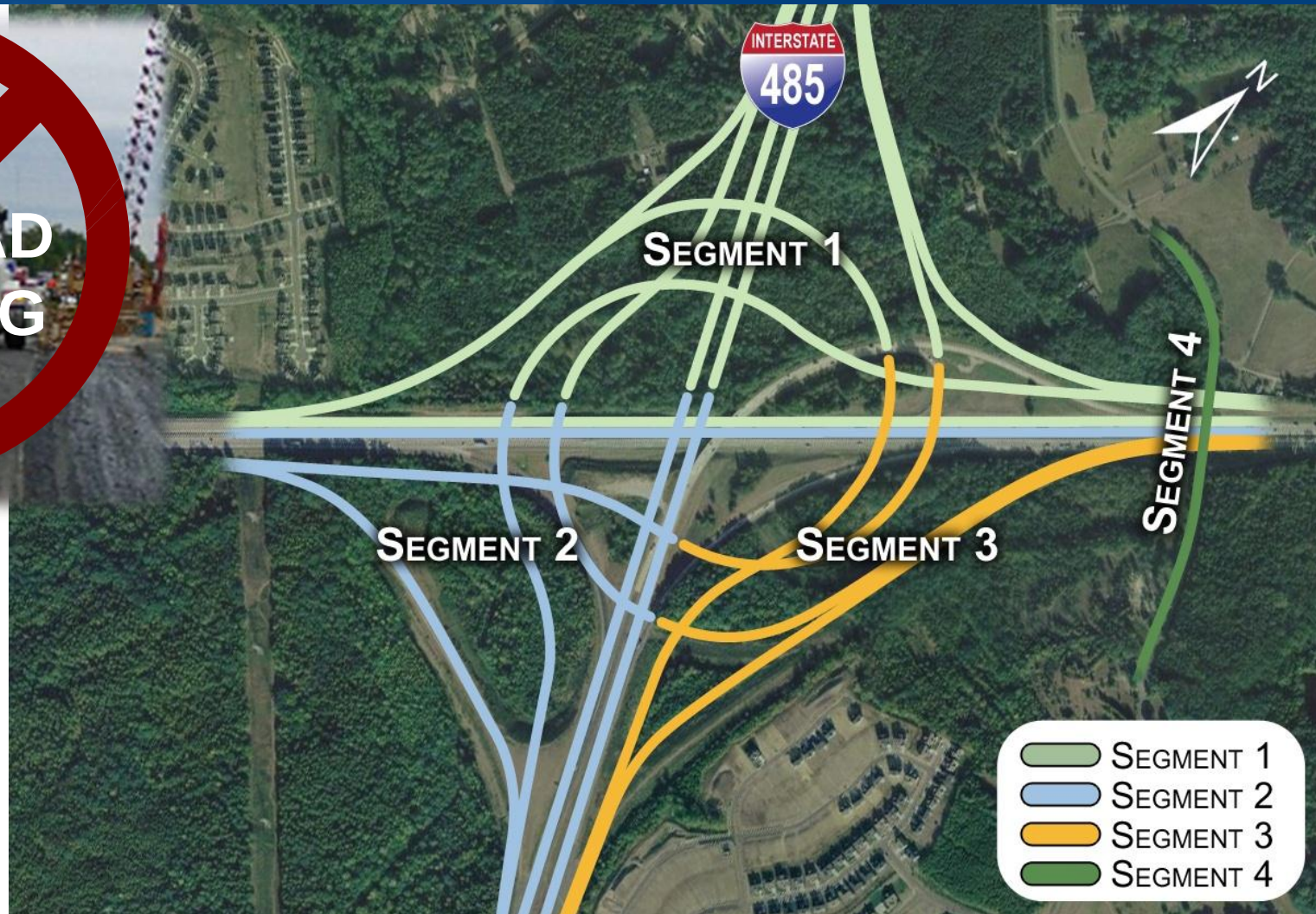


# Construction Overview



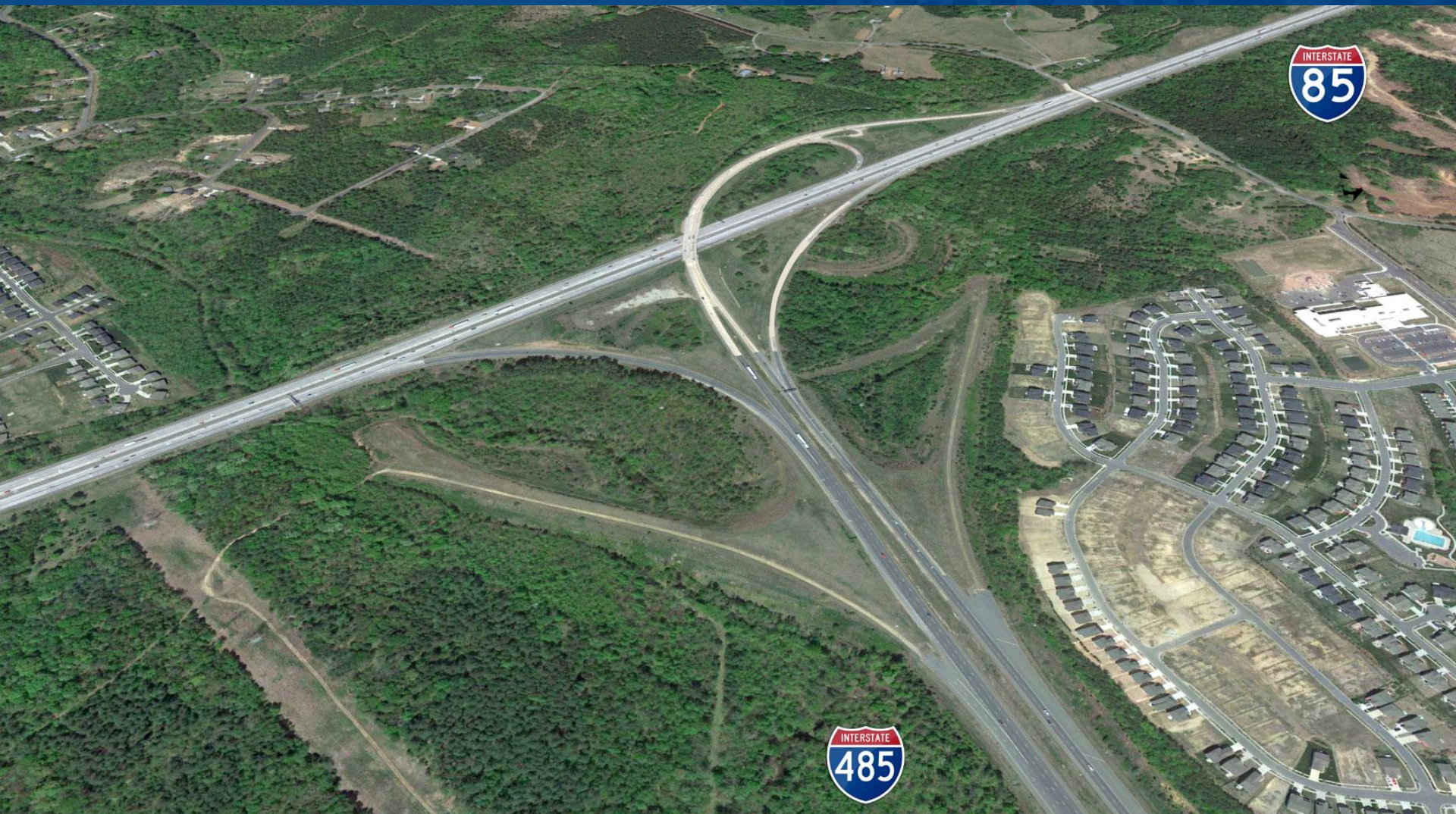


# Work Segments



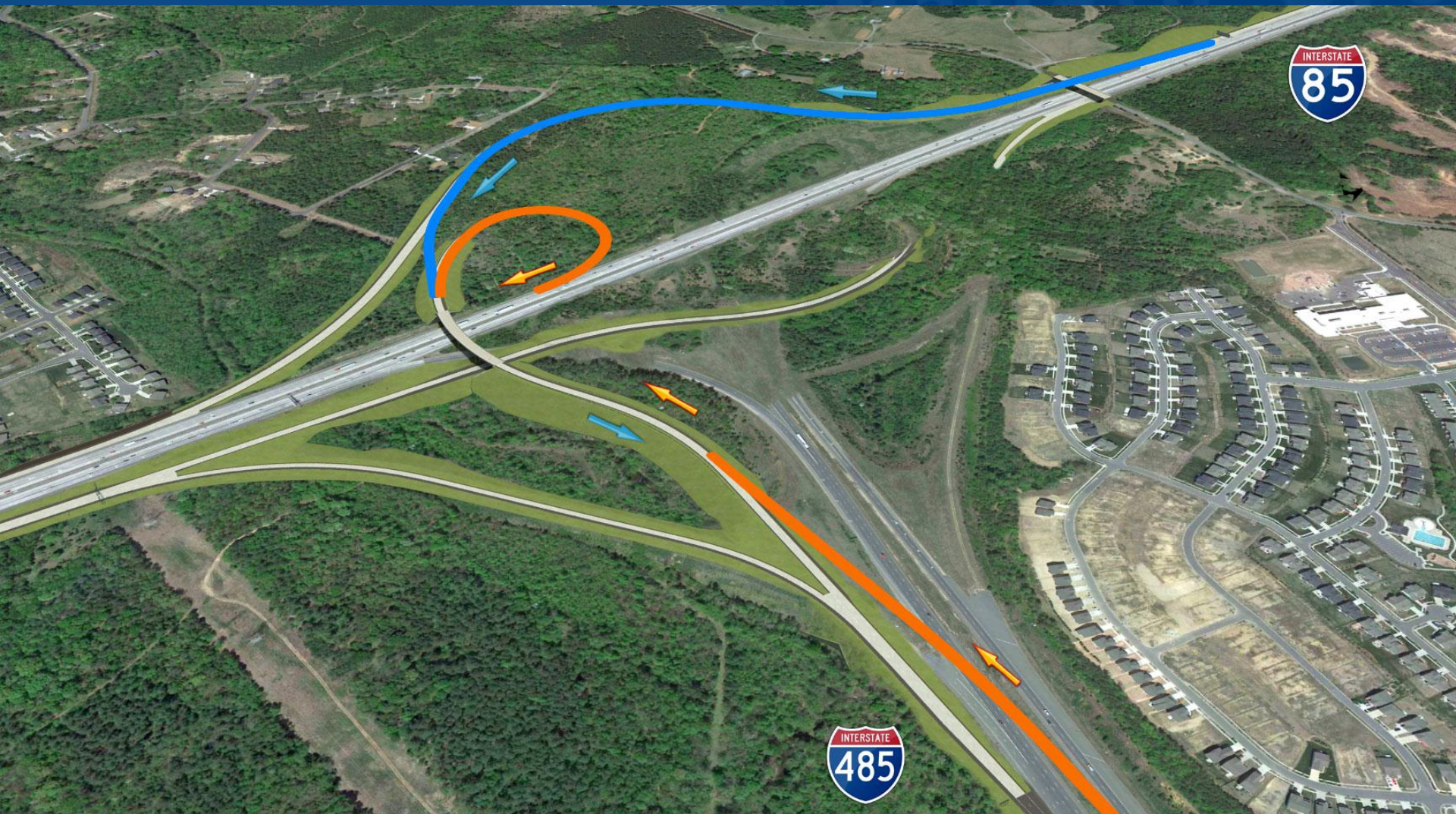


# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties



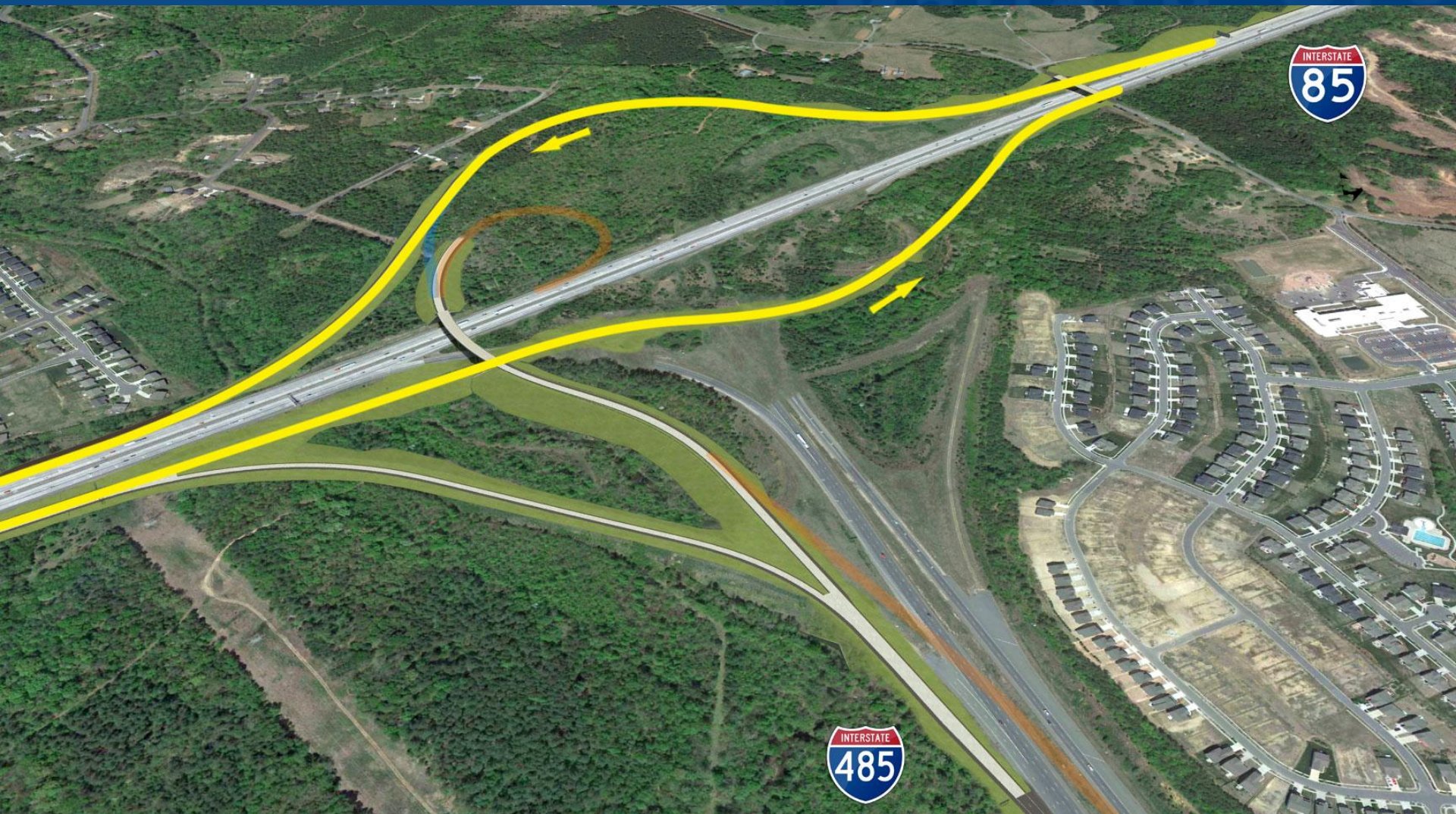


# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties





# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties



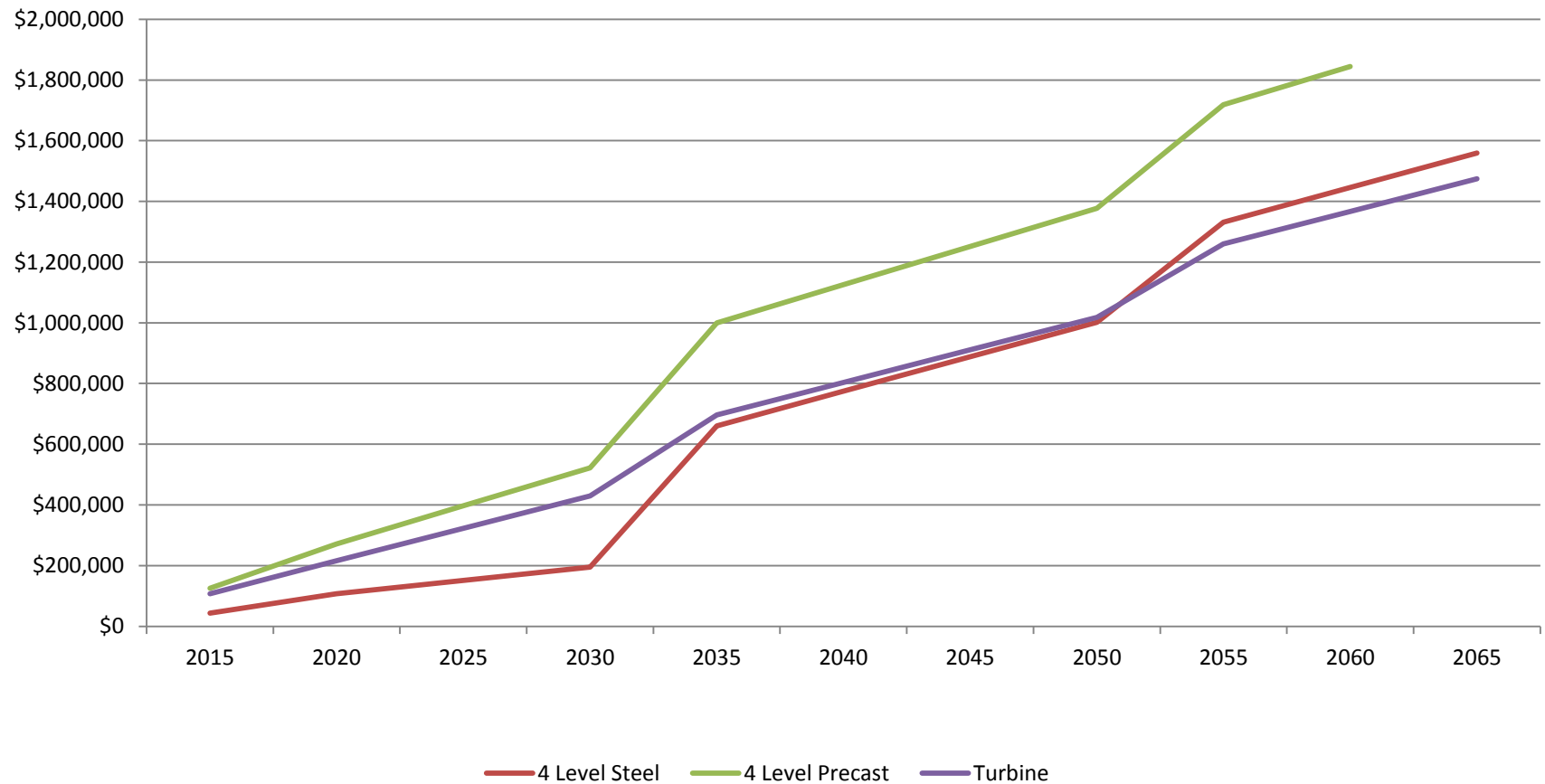


# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties



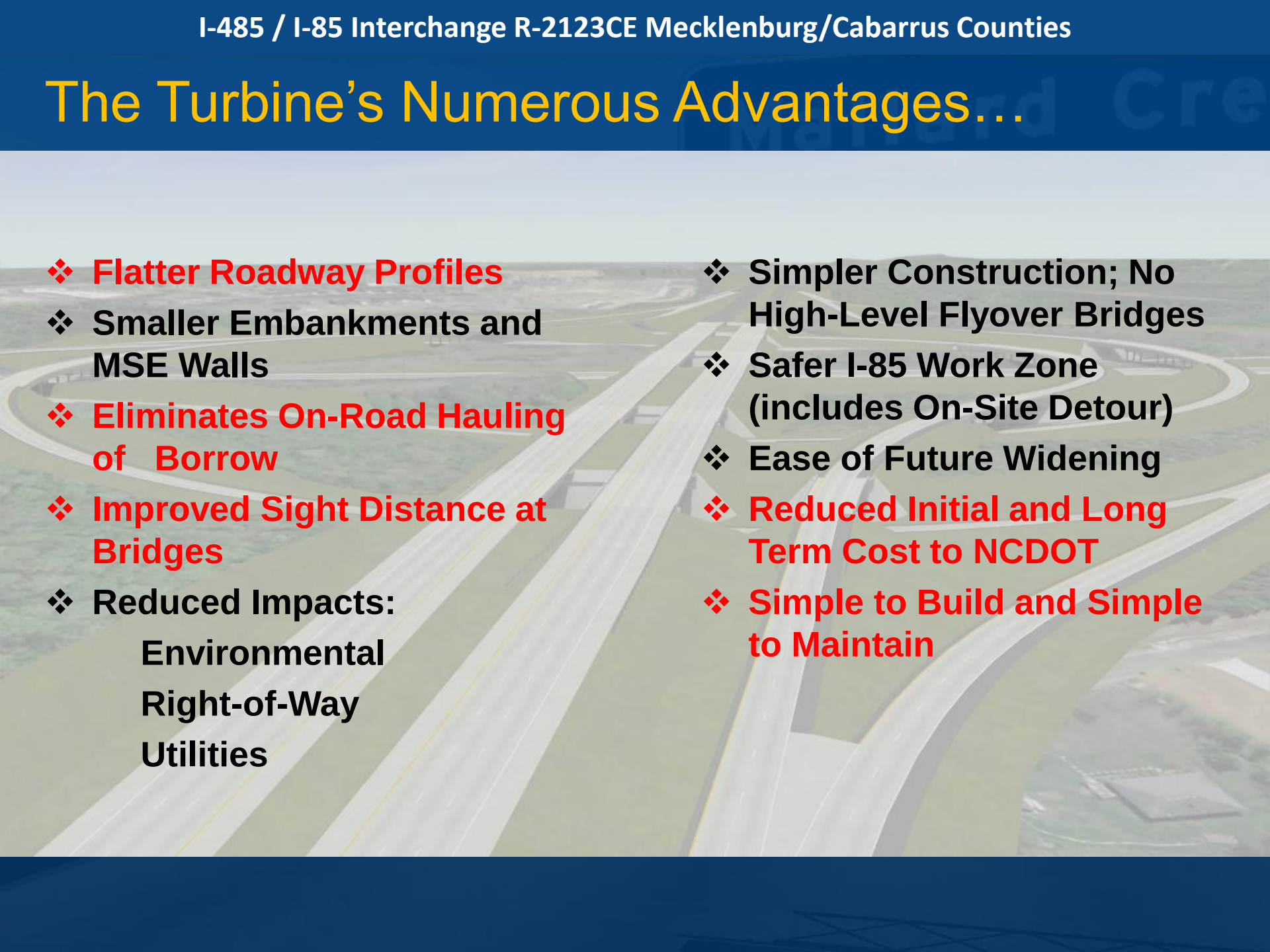


# Maintenance Comparison





# The Turbine's Numerous Advantages...

- 
- An aerial photograph of a highway interchange, likely I-85 and I-485, showing a proposed 'turbine' design. The design features a series of curved, overlapping roadways that create a more open and efficient interchange compared to traditional flyover bridges. The background shows surrounding greenery and some industrial or commercial buildings.
- ❖ **Flatter Roadway Profiles**
  - ❖ **Smaller Embankments and MSE Walls**
  - ❖ **Eliminates On-Road Hauling of Borrow**
  - ❖ **Improved Sight Distance at Bridges**
  - ❖ **Reduced Impacts:**  
Environmental  
Right-of-Way  
Utilities
  - ❖ **Simpler Construction; No High-Level Flyover Bridges**
  - ❖ **Safer I-85 Work Zone (includes On-Site Detour)**
  - ❖ **Ease of Future Widening**
  - ❖ **Reduced Initial and Long Term Cost to NCDOT**
  - ❖ **Simple to Build and Simple to Maintain**



# I-485/I-85 Bid Results

## NO GAP FUNDING NEEDED

| Proposer | Score | Quality Credit | Bid Price     | Adjusted Price | Completion Date |
|----------|-------|----------------|---------------|----------------|-----------------|
| Lane/STV | 94.5  | 16.34          | \$ 92,162,250 | \$77,102,938   | June 10, 2014   |
| Team2    | 93.0  | 15.33          | \$103,700,000 | \$87,802,790   | March 30, 2014  |
| Team 3   | 86.0  | 10.67          | \$105,582,933 | \$ 94,317,235  | Sept 1, 2014    |
| Team 4   | 86.0  | 10.67          | \$119,630,000 | \$106,865,479  | July 13, 2014   |

**Engineer's Estimate 124,291,688.00**



# I-485 / I-85 Interchange R-2123CE Mecklenburg/Cabarrus Counties



**January 2014**



# THANK YOU

