495 EXPRESS LANES

Virginia Concrete Conference

Mitch Lester – Project Director
Bob Portley – Deputy Project Director - Construction
What Are 495 Express Lanes?

» Two new lanes in each direction on the Virginia side of the Capital Beltway – from the Springfield Interchange to just north of the Dulles Toll Road

» High Occupancy Toll (HOT) lanes that will provide faster, more direct options for high-occupancy vehicles and toll-paying customers

» More reliable trip for all users through dynamic pricing to ensure the lanes maintain highway speeds at all times of day – even during rush hour
The project is delivering the most significant improvements to the Capital Beltway in a generation:

- Replacement of more than $260 million of aging infrastructure, including 58 bridges and overpasses
- Replacement of existing sound walls and construction of new sound walls to nearly triple existing noise protection
- Expansion of region’s HOV service through new connections from I-495 to existing HOV lanes on I-95/395, I-66 and Dulles Toll Road
- Upgrades to 12 key interchanges and new access points at Merrifield and Tysons Corner
Partnership Delivers Benefits

» Public-Private Partnership:
  – 495 Express Lanes are the product of a public-private partnership between the Virginia Department of Transportation, the Virginia Department of Rail and Public Transportation, the Federal Highway Administration and Transurban-Fluor
  – The 495 Express Lanes are funded through a contribution from the Commonwealth, private equity, private activity bonds and a federal loan through the government’s TIFIA program
About Us

Amended & Reinstated Comprehensive Agreement

Capital Beltway Express LLC

Design-Build Contractor

Operations & Maintenance

Design-Build Contract

subcontractors

ETC Maintenance

Roadway Maintenance

O&SS Contract
495 Express Lanes Benefits

» Options:
  – 495 Express Lanes will provide drivers with an option to pay a toll for a faster, more predictable trip

» Access:
  – The Express Lanes provide three new direct access points into Tysons Corner and Merrifield

» Control:
  – Whether you travel by car, carpool or bus, the Express Lanes will give you the freedom to control how and when you get to your destination
Construction Progress

» Among largest highway construction project in U.S. ($1.43B)
» On-time and on-budget
» 88% complete, opening late 2012
» Exceeding safety standards:
  – Worked over 3.6 million safe work hours
  – OSHA recordable rate is 0.78 compared to the national average of 4.7
» Public support through aggressive outreach
Construction Overview
General Construction Plan

» Build four outer general purpose lanes: 2008-2011
» Rebuild/lengthen all bridges and overpasses along alignment: 2008 – 2011
» Shift traffic into two new outer general purpose lanes: 2010 – 2011/2012
» Build inner four HOT lanes: 2011 – 2012
» Express Lanes
  Opening: Late 2012

Four center lanes are being constructed between the Inner/Outer Loops of the Beltway.
Construction by the Numbers

» 1,200 Fluor-Lane employees and subcontractors
» 58 new bridges and overpasses
» 12 key interchanges being rebuilt
» 1.3M tons of asphalt
» 21,400 tons of steel
» 224+ pieces of heavy equipment
» 80,000 linear feet of sound walls
» 890,000 square feet of retaining walls

The new I-66 Interchange will consist of a 5th right lane on I-495 North up to the Route 7 exit.
Concrete

» 105,021 cy of concrete total
  – 735 cy flowable fill
  – 19,199 cy A-3 3000 psi Concrete
  – 2,540 cy A-3.5 3500 psi Concrete
  – 56,405 cy A-4 4000 psi Concrete
  – 26,142 cy A-4.5 4500 psi Concrete (Bridge Deck)
  – Per month average: 3,550 cy
  – 740 cy largest deck placement
Concrete

» **Concrete usage**
  - Bridge decks, piers, drilled shafts, abutments, box culverts, MSE/retaining/sound walls, median barrier, paving rehab, sidewalks, curb and gutter

» **Suppliers**
  - Virginia Concrete Co.
  - Titan (subcontractor)
  - DuBrook Concrete (subcontractor)
Concrete

Issues and challenges

- 14 mile construction zone
- Working under heavy traffic
  - Ability to get concrete to the field
- Year-round construction schedule
- Extensive night work to allow needed lane closures
Concrete

Issues and challenges

- 4 construction areas with own teams and project deadlines
- Multiple concrete placements need close coordination between Fluor-Lane, subs, suppliers & QC
Concrete

Issues and challenges

➢ Developing ways to increase concrete production/construction and getting partners on board

➢ With multiple simultaneous concrete activities and subs, assuring right concrete arrives at right job.

➢ Include mix design # with TI-28A Coding Form
Concrete – Quality Control

» Quality Control Program

<table>
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<tr>
<th>Quality Tests as of January 15, 2012</th>
<th>QC</th>
<th>QA</th>
<th>Total</th>
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<tbody>
<tr>
<td>Concrete Field Tests</td>
<td>17,519</td>
<td>3,740</td>
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<tr>
<td>Low Permeability Tests</td>
<td>4,105</td>
<td>410</td>
<td>4,515</td>
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Images:
Concrete

Lessons Learned

- Coordination with Quality Department to ensure proper inspector coverage for work
- Enhanced QC testing leads to reduction in failing concrete
- Specific concrete mix for each task
  - QC must assure correct mix at job site
- Better coordination with the concrete suppliers to achieve better concrete quality
Concrete

Lessons Learned

» On-site vendor rep for large placements

» Utilize advance technology like Temperature Loggers & rolling straight edge

» Better procedures, training and delivery of cold weather concreting allows deck placements in winter months ensuring schedule while maintaining high quality standards
Concrete

Lessons Learned
» The use of forced air heaters to heat the substrate and cure multiple span deck placements
» Preparatory meetings for all deck placements and complicated tasks pay dividends
» Creation and use of proper concrete wash areas
Concrete

Lessons Learned
» Unit weights (or yields) and concrete permeability results very consistent
» Manufactured sand perception
» Understanding of Retarding Admixture
» Plant Technicians on Site
» Tremie Concrete Placement
Concrete – Results

» Concrete continues to be the workhorse of roadway infrastructure construction

» Technology brings better delivery and placement methods

» Innovative concrete applications mean better, less expensive and easier to build structures including: MSE walls, sound walls and median barrier
Concrete – Q&A

March 2011

January 2012