Project History and Complexity
29.7 miles of **reversible express lanes** along I-75, Georgia’s most congested highway, and along I-575

6 separate express-lane-only interchanges were constructed

Dynamically tolled to assure reliable travel times

Opened for use September 8, 2018

First Design-Build-Finance contract managed by GDOT

Saved approximately $110 million through innovative design and alternative technical concept
Project History

Project Development

→ 2004 – state receives unsolicited proposal from industry

→ 2006 – DOT accepts proposal

→ 2007 – DOT discusses innovative delivery alternatives

→ 2010 – DOT releases RFQ for a DBFOM

→ 2011 – DBFOM changed to a DBF

→ 2013 – project awarded to Northwest Express Roadbuilders (NWER)
Project History

Development of JV

60%

ARCHE WESTERN

40%

HUBBARD

NORTHWEST EXPRESS
ROADBUILDERS

COMPANY CULTURE

teamwork
Project History

Construction Schedule

- NTP (2) - Start of Construction: October 2014
- 11 interim ITS milestones
- 17 NOIs
## Project History

### Safety

<table>
<thead>
<tr>
<th>Incident</th>
<th>Frequency</th>
<th>Severity</th>
<th>Man Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.50</td>
<td>22.49</td>
<td>3,076,465</td>
</tr>
</tbody>
</table>

- **Incident**: 1.50
- **Frequency**: 0.33
- **Severity**: 22.49
- **Man Hours**: 3,076,465
Scale and Complexity
Largest Transportation Project in Georgia History

Design Project of immense scale
- 30 miles of reversible managed lanes
- 6 new express lane interchanges, 3 new access points
- 40 bridges, lengths totaling 27,000 linear feet, 1.02 million total square feet of bridge deck supported by 195 intermediate bents
- 70 retaining walls, up to 45 feet tall, 10.5 miles in total length
- 1.4 million square feet of noise barriers
- 120 overhead sign structures
- 315,000 square yards of concrete paving
- 92,000 linear feet of precast concrete beams

“In any moment of decision, the best thing you can do is the right thing, the next best thing is the wrong thing, and the worst thing you can do is nothing.”
- Theodore Roosevelt

Making Decisions = Progressing Construction
Complexity

Workforce Development and Challenges


SKILLED CONSTRUCTION WORKERS SHORTAGE
Design and Construction
Design and Construction
Settlement Impacts to Existing Utilities

Problem
Settlement predictions from standard laboratory testing in Piedmont Residuum Soils are not reliable and typically overstate compared to actual settlements measured.

Original settlement prediction at Wall 74 (from laboratory testing) was **8 inches**
Design and Construction

Design Considerations

Utility near STA 772
30" Ductile Iron Pipe Water Line
Cased with 54" Steel Liner

DMT results
Consolidation results
Vertical Settlement

Joint Rotation Along Settlement Profile - Laying Length: 20ft

Elastic Beam Stress (positive is compression)

Steel Casing, 0.5in thick

(Mayne, 2005)
Design and Construction

Design Considerations

The new settlement prediction is 4 inches.

That is a 50% reduction.

Flat Plate Dilatometer

Analysis Model

Settlement Curve
Design and Construction

Protective Slab Concepts

Problem
• The Express Lanes pass directly over existing deep drainage (box culverts), significantly increasing the dead load to the structures. The typical design would require a new exterior MSE (Mechanically Stabilized Earth) retaining wall in areas of low terrain, but this posed a difficult structural/geotechnical problem.

Innovative Solution:
Parsons developed an innovative “protective slab” concept— a structural slab directly above the existing culvert, designed to transfer the weight of the soil above the slab directly to piles founded on the underlying bedrock. The large loads from material above the protective slabs resulted in very robust protective structures.
Design and Construction

Accelerated Bridge Construction (ABC) Methods

Top-Down Construction

- Utilized pre-cast hammerhead pier caps for a 3,500-foot-long bridge to provide site access
- Used drilled shaft foundation to minimize excavation and disturbance to the wetlands
- Method minimized impacts to the public by avoiding extensive lane closures of southbound I-75 and resulted in reduced construction cost and time.
Design and Construction
Accelerated Bridge Construction (ABC) Methods

Straddle Bent Construction

- Very tight geometry controls
- Two-stage precast concrete straddle bent cap solution was utilized to meet geometry restraints, minimize impacts to traffic, and provide an economical and high-quality construction solution.
- Most of the bridge to be cast on-site, adjacent to the roadway, in turn minimizing the number of cast-in-place components.
Partnering
Partnersing
Project Team

**GDOT**
→ Manager of contract

**State Road and Tollway Authority**
→ Owner of contract and tolling infrastructure

**NWER**
→ Archer Western, Hubbard Construction, Parsons Transportation Group, Moreland Altobelli

**HNTB**
→ Project Management Consultant

**Atkins**
→ Owner’s Verification Firm

**Michael Baker**
→ Owner’s on-site Design Review Consultant

**FHWA**
→ Oversight
Partnering

Project Team Meetings & Reviews

Executive Weekly Meetings

→ Owner, Developer and Project Management Consultant – address unresolved issues from discipline-specific teams

→ Top 5 List

Project Team Meetings

→ Project Leads and Discipline Leads – address, schedule and progress work

Over-The-Shoulder Reviews

→ Owner-Design Submittal Review Team and EOR

Weekly Communications Meetings

→ Provide stakeholders and public with pertinent project updates

Task Force Meetings
Executive Partnering

Executive Partnering Meetings

Craig A.
Facilitator

Resolve Major
Issues

What did these
meetings
accomplish?

Executive
involvement
from both sides

Better team
relationship/moral

Overcoming
differences of opinion

Better
Executive Partnering

Internal/External Communication

CONSTRUCTION ISSUE RESOLUTION LADDER

<table>
<thead>
<tr>
<th>Construction Team</th>
<th>GDOT/SRTA Counterpart</th>
<th>Max Time</th>
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<tr>
<td>JV Executive Committee</td>
<td>Construction Engineer</td>
<td>1 week</td>
</tr>
<tr>
<td>Project Manager</td>
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<td>72 hours</td>
</tr>
<tr>
<td>Project Engineer</td>
<td>Resident Engineer</td>
<td>48 hours</td>
</tr>
<tr>
<td>Field Engineer</td>
<td>Field Engineers as assigned</td>
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</tr>
<tr>
<td>Task-Force Discipline Lead</td>
<td>Engineers (walls, structures, etc.) as assigned</td>
<td>24 hours</td>
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Quality Model
Quality Model

Northwest Corridor Model

GDOT

OMAT (Records)

PMC (PM/CM)

Owner Verification Firm/ Materials Acceptance Testing
10% check

Submittals Review Consultant
[Serve as GDOT SME Reviewer]

Developer
[Contractor / EOR / Quality Assurance Firm]
100% check

Environmental Consultant
25

The Northwest Corridor construction quality program was developed on:

1) 23 CFR 637.207(b)

2) Federal Highway Administration (FHWA) Technical Advisory T6120.3, non-regulatory supplement

3) NS 23 CFR 637B

4) TechBrief (FHWA-HRT-12-039)
Quality Model
Every drawing and calculation received a complete and independent check.
Plan-Act-Check-Excel (PACE) is the controlling concept that defines quality management.

Design development process and reviews:
- Interdisciplinary Review
- Constructability Review
- Independent Design Review

External Reviews:
- Agency and Regulatory Reviews
- Over-The-Shoulder (OTS) Reviews
- Comment Incorporation

Core design Team Co-location a key to success
Conclusions
Lessons Learned

WINS

• Co-Location
• Public Outreach
• DBF Agreement and Quality Model from Owner Perspective
• Coordination with OMAT and FHWA to obtain Materials Certificate
• E-construction

RECOMMENDATIONS FOR MAJOR PROJECTS

• Aggressive Project Start-Up
• Project Progression
• Early Coordination for Tolling/Operations Implementation
• Project Closeout
Meeting Goals through a World-Class Managed Lanes Facility

Overall Value

Since opening on September 8, 2018, the express lanes are providing predictable travel times and options which improve the quality of life for the traveling public.

The Northwest Corridor Express Lanes offer drivers and transit customers a host of benefits including:

- More reliable trip times
- Improved traffic flow
- More travel options for motorists and transit customers
- A more free-flowing trip
- Cost-free trips for transit riders and registered vanpools

The Express Lanes use Dynamic Tolling, which insures reliable and predictable travel times in the express lanes.

On average commuters using the Express Lanes have experienced approximately 45 minutes in travel time savings.

Commuters using the I-75 General Purpose lanes are also recognizing travel time benefits from the opening of the Express Lanes.

After opening on September 8, 2018, weekday express lane users are saving an average of 45 minutes every day, with many proclaiming the benefits to them as “life changing”.

Mike Plant, Cumberland CID Board and President of Development, Atlanta Braves

"While SunTrust Park is home to the Atlanta Braves, The Battery Atlanta has become home to a community of businesses, retailers, residents, fans, and visitors. With entertainment, dining, and non-game related events happening every day, The Northwest Corridor Express Lanes have been a true game-changer for the development. Whether you’re a resident, sports fan, or employee, you can enjoy more time here without worrying about sitting in the unmanageable traffic. Those lanes have helped to create a major economic benefit to the district."

Ron Sifen, Resident of Cobb County

"I am a community advocate for transportation issues. I'm looking for good projects that are cost effective and will have the most impact on improving traffic flow. Just to give you an idea of how well the Northwest Corridor Express Lanes are working, rush hour is ending more than an hour earlier than it used to. In addition, we have the SR 400 Express Lanes that are getting close to the point where construction can begin. Once we get all of those done and we have all the express lanes connected, I actually think that we'll get to a point by 2028 where Atlanta no longer shows up around the top 20 most congested cities in this country."