Dulles Corridor Metrorail Project – Phase 2
Keith Couch, Senior Vice President, Clark Construction
Project Director, Capital Rail Constructors
THE TEAM
Design-Build Team: Joint Venture

Capital Rail Constructors
A Clark and Kiewit Joint Venture

CLARK CONSTRUCTION

Kiewit

SHIRLEY CONTRACTING COMPANY, LLC
Design-Build Team: Designers
Phase 2 – Other Stakeholders

- U.S. Department of Transportation
- Federal Transit Administration
- Virginia Department of Transportation
- United States Army Corps of Engineers
- Metropolitan Washington Council of Governments
- Fairfax Water
- Northern Virginia Transportation Authority
- Loudoun County Virginia
- Fairfax County Virginia
- Loudoun Transit
- Drpt - Virginia Department of Rail and Public Transportation
- Commonwealth of Virginia Department of General Services
- Commonwealth of Virginia Department of General Services - Serving Government, Serving Virginians.
## Funding – Direct Source

<table>
<thead>
<tr>
<th>Source</th>
<th>Total</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>$900</td>
<td>15.6%</td>
</tr>
<tr>
<td>Commonwealth of Virginia</td>
<td>575</td>
<td>10.0%</td>
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<tr>
<td>Northern Virginia Transportation Authority</td>
<td>60</td>
<td>1.0%</td>
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<tr>
<td>Fairfax County</td>
<td>918</td>
<td>15.9%</td>
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<tr>
<td>Loudoun County</td>
<td>274</td>
<td>4.7%</td>
</tr>
<tr>
<td>MWAA (Aviation Funds)</td>
<td>234</td>
<td>4.1%</td>
</tr>
<tr>
<td>MWAA (Dulles Toll Road)</td>
<td>2,800</td>
<td>48.6%</td>
</tr>
<tr>
<td><strong>TOTAL FUNDING SOURCES</strong></td>
<td>$5,760</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Colors Meaning:**
- Yellow: Fixed Amount
- Red: Fixed Percentage of Total Cost
- Green: Residual
Funding – TIFIA Loan

Transportation Infrastructure Finance and Innovation Act (TIFIA)

$1.875 billion combined low-interest loan
Located within Two Counties
Surrounded by Major Commuter Roads
PROJECT OVERVIEW
Part of DC Metrorail System
Dulles Corridor Metrorail Project – Phase 2
Package A Scope
Phase 2: Alignment

WASHINGTON
DULLES INTERNATIONAL AIRPORT

ASHBURN
Loudoun County Parkway
Route 28

Town of Herndon
Reston Town Center
Fairfax County Parkway

Reston Parkway

Route 606/West Ox Road

DULLES AIRPORT

LOUDOUN GATEWAY

INNOVATION CENTER

Segments N13, N14, N88
Package A and B Interface

Package A
Mainline Yard Leads

Package B
Rail Maintenance Facility
Package A and C Interfaces

At-Grade Station
Aerial Station
Line Bridge

Ashburn
Broad Run
Loudoun Gateway
Aerial Guideway
Horsepen Run
Innovation Center
Centreville Rd.
Herndon
Reston Town Center
Dulles Airport

PACKAGE C GARAGES
Loudoun Development

Digital Realty

CyrusOne

DFT DuPont Fabros Technology

Equinix

Facebook

Major Entitled Projects (>20 Acres): Vacant Land, Square Footage Outside Silver Line Area Density (0.40 FAR or Max): 51,849,259

50% is Mixed-Use.
Fairfax Development
CRC - CONTRACT OVERVIEW

Contract Value
$1.3 billion

Substantial Completion:
Fall 2019

Disadvantaged Business Enterprise (DBE) Goal = 14%
CRC – Project Organization

Five Key Teams

- Civil 22%
- Structures 15%
- Facilities 27%
- Rail 11%
- Systems 25%
Facilities – Dulles Airport Station

Canopy: Structural Steel
Facilities – Dulles Airport Station

Mat Slab Foundation System
Facilities – Dulles Airport Station

Mat Slab Foundation System
Facilities – Dulles Airport Station

- Cast-in-Place Columns: 18 Track Piers
- Cross Girders: 9
- Walls: 2,000 lf
Facilities – Dulles Airport Station

Connection to Pedestrian Tunnel and Daily Garage 1
Facilities – Dulles Airport Station

Connection to Pedestrian Tunnel and Daily Garage 1
Facilities – Dulles Airport Station

Connection to Pedestrian Tunnel and Daily Garage 1
Facilities – Five (5) At-Grade Stations

- Reston Town Center Station
- Herndon Station
- Innovation Station
- Loudoun Gateway Station
- Ashburn Station
Facilities – Station Foundation System

Reston Town Center Station: Steel Piles

Herndon Station
Innovation Station
Loudoun Gateway Station
Ashburn Station

{ Spread Footings }
Facilities – Station Building Structure

Pre-Cast Concrete
Facilities – Station Vault

Structural Steel
Facilities – Station Roof

Metal Panels and Skylights
Facilities – Station Electric

34.5 kV from Dominion Virginia Power
Facilities – Station Pedestrian Bridges

- Reston
- Herndon
- Innovation
- Ashburn
- Loudoun Gateway
Facilities – Station Pedestrian Bridges

• Drilled Shaft Foundations
• Cast-in-Place Columns and Caps
Facilities – Station Pedestrian Bridges

- Structural Steel
- Metal Panel Finishes
Facilities – Station Entrance Pavilions

Foundations: Cast-in-Place
Structure: Precast and Cast-in-Place
STRUCTURES
Structures – Drilled Shafts (Mono)

197 Shafts
Diameter: 7.5’ x 8.5’
Structures – Cast-in-Place Columns

- 137 Round Columns
- 54 Rectilinear Piers
Structures – Cast-in-Place Caps

103 Caps
- Hammerhead: 90
- Rosebud: 12
- Small Straddle Bent: 4
8 Straddle Bents
Largest
• Concrete: 475 cy
• Rebar: 35 tns
• Length: 134 lf
• Depth: 15’ 10”
Structures – Girders

622 Girders
Structures – Decks

177 Decks
Structures – Precast Sound Panels

Precast Panels: 35,082 lf
Structures – Spherical Bearings

1,180 Spherical Bearings
Structures – Bridges

Horsepen Run, Centreville Road: 2 Through Girder Single Span 150’
Structures – Bridges

Broad Run:
1 3-Span Plate Girder 434’
Track: Ballasted

Ballasted Track: 87,000 Track Feet
Track: Direct Fixation

Direct Fixation Track:
• Plinth: 37,178 lf
Track: Cable Trough

Precast Cable Trough: 85,730 ft
Cast-in-Place Cable Trough: 38,520 ft
Systems

- Utility Power: 34.5kV AC
- 9 Traction Power Substations
- 6 Tie Breaker Stations
- Train Control System
- Other Systems:
  - Fire Alarms
  - Intrusion Detection
  - SCADA
  - ETS
CIVIL – Grading/Excavation/Paving

Excavation: 420,000 CY
CIVIL – Storm Drainage

- Pipe: 85,000’
- EA Structures: 950 each
CIVIL – Median Trackwall Barrier

Trackwall: 78,000’
CIVIL – Ductbank

Wayside Ductbank: 30,000’

34.5 kV Ductbank: 62,300’
Current Project Status

Design and Construction: 57%
Construction Status: 52%
Design Status: 99%

Planned Turnover to WMATA: 2019
Planned Revenue Service: 2020*

* Determined by WMATA
CHALLENGES
Challenges

- Access
- Adjacent Land Owners
- Multiple Stakeholders
- Equipment Management
- Hard Rock – Diabase
- Pedestrian Bridge Logistics
- Working on Operating Airport
- Start-up/Commissioning
QUESTIONS?