**4.1.5 ORGANIZATIONAL SYSTEMS**

**FIGURE 4.1.5-1** Organizational Systems in Place to Prevent Disputes

![Diagram of Organizational Systems](image)

These organizational systems have achieved positive results on similar DBFOM infrastructure projects in the U.S. totaling more than $5 billion, including LBJ Express, North Tarrant Express Segment 1 and 2, and North Tarrant Express 35W—a proven successful long-term partnership with the Texas Department of Transportation (TxDOT), and zero disputes, delay or compensation event claims.

I-66 Express Mobility Partners’ primary organizational systems, depicted in Figure 4.1.5-1, will result in a meaningful partnership with the Department, identify and resolve issues quickly, and avoid the formal dispute resolution process.

**A. UNIFIED APPROACH TO ALL ELEMENTS OF WORK**

Our unified approach is heavily influenced by our team members’ previous experience collaborating with each other, shown in Figure 4.1.5-1.

**Technical Work Groups**

Technical Work Groups (TWGs) will serve as our primary organizational system to capitalize on our team’s previous experience working together and integrate design, construction, operations, maintenance and quality team members, including subcontractors, suppliers, and consultants for all aspects of the work. A summary of the TWGs proposed for the Project are shown in Table 4.1.5-1. A key component of successful TWGs will be an effective partnership with the Department and other stakeholders, including WMATA and DRPT. Further described in 4.1.5.e, we anticipate partnering with the Department, WMATA and DRPT to align our sub-organization with each entity and enhance communication.

The TWGs will occur throughout the Project, starting in the RFP phase and continuing through Handback. The TWG Lead has the authority to schedule a TWG meeting, which will occur at least weekly during the Design-Build phase and bi-weekly during the Operating Period. The same leadership and management personnel will be involved in the TWGs and the Project across both phases (time commitments are shown in 4.1.1.b), which will contribute to the consistency and productivity during these sessions and ensure that a long-term perspective is applied to the Project. The continuity of our management personnel and overlapping responsibilities eases the transition between phases, enhances our ability to work as a unified team and contributes to the prevention of disputes.
TABLE 4.1.5-1  Technical Work Groups

The TWGs will serve as a means to integrate our team’s suborganizations, depicted in Section 4.1.1.a. A summary of each TWG meeting will be uploaded to the EDMS explained in Section 4.1.2, to which all disciplines will have access. The TWGs include personnel from various sub-organizations to facilitate communication across the entire team. The individuals that participate in the TWG share the information from the TWG with the rest of their sub-organization. This communication line also brings field issues back to the TWGs.

<table>
<thead>
<tr>
<th>SUBORGANIZATIONS</th>
<th>Developer’s P3 Project Manager’s Office</th>
<th>Lead Contractor’s P3 Project Manager’s Office</th>
<th>Construction Management</th>
<th>Design</th>
<th>Health, Safety and Environmental</th>
<th>Risk Management and Project Controls</th>
<th>Quality</th>
<th>Right-of-Way</th>
<th>Operations and Maintenance</th>
<th>Toll Operations and ITS</th>
<th>Corporate Affairs and Public Information</th>
<th>Customer Strategy</th>
<th>Traffic and Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>●</td>
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<td>Environmental</td>
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<td>Geotechnical</td>
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<td>Right-of-Way</td>
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<td>Traffic Management</td>
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<td>Paving</td>
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<tr>
<td>WMATA Project</td>
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<td>Quality</td>
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<tr>
<td>ETTM System</td>
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<td>ITS</td>
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<td>Toll Operations</td>
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<tr>
<td>Customer Service</td>
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<tr>
<td>Maintenance/Incident Mgmt.</td>
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<tr>
<td>Lifecycle</td>
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</tr>
</tbody>
</table>
B. DECISION MAKING PROCESS

Contractual Framework

In order to mitigate potential issues before they actualize and prevent impact to cost, schedule and/or quality, I-66 Express Mobility Partners will implement its proven successful internal contractual framework which authorizes decision-making protocols and dispute avoidance processes.

Decision-Making Authority: Our decision-making protocols were developed, agreed to with formal Agreements, and implemented by team members on previous projects to define autonomous decision makers at every level of the organization. This approach grants authority for important decisions during all phases of the Project. Lower levels of our organization will be empowered to make certain day-to-day decisions immediately. When decisions cannot be decided at the lowest level, the topic will be escalated quickly.

TABLE 4.1.5-2 Decision-Making Authority

<table>
<thead>
<tr>
<th>Between Equity Members</th>
<th>Between Developer and Lead Contractor</th>
<th>Between Members of the Lead Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grants Developer’s P3 Project Manager responsibility for Developer day-to-day decisions</td>
<td>Grants all design-build work responsibilities to the Lead Contractor on a back-to-back basis</td>
<td>Grants Lead Contractor’s P3 Project Manager responsibility for Lead Contractor day-to-day decisions</td>
</tr>
<tr>
<td>Cintra and Meridiam have entered into similar agreements on more than 25 previous projects, four of which included Meridiam; no formal disputes were ever raised</td>
<td>Cintra and Ferrovial Agroman have entered into similar agreements on more than 25 previous projects, four of which included Meridiam; no formal disputes were ever raised</td>
<td>Ferrovial Agroman and Allan Myers have entered into similar agreements in the past; no formal disputes were ever raised</td>
</tr>
</tbody>
</table>

Proactive Prevention of Disputes: Our team is uniquely structured to mitigate the potential for internal disputes. Our approach grants authority for important decisions during all phases of the Project. Lower levels of our organization will be empowered to make certain day-to-day decisions immediately. When decisions cannot be decided at the lowest level, the topic will be escalated quickly.

TABLE 4.1.5-3 Alignment of Interests

EQUITY MEMBERS AND DEVELOPER

Cintra and Meridiam each have a 50% equity and O&M share, are long-term operators and are long-term partners with their clients

Ensures what is best for the Project is prioritized over what is best for a single member

DEVELOPER AND LEAD CONTRACTOR

Cintra and Ferrovial Agroman belong to the same parent company, Ferrovial, S.A.

Guarantees no formal disputes between Developer and Lead Contractor will be initiated

TABLE 4.1.5-4 Pre-Defined Authority for Major Decisions

<table>
<thead>
<tr>
<th>Major Decisions</th>
<th>Decision-Maker: Design-Build Phase</th>
<th>Decision-Maker: O&amp;M Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Decisions</td>
<td>Developer’s Board of Directors</td>
<td>Developer’s Board of Directors</td>
</tr>
<tr>
<td>Overall Responsibility</td>
<td>Developer’s P3 Project Manager</td>
<td>Developer’s P3 Project Manager</td>
</tr>
<tr>
<td>Schedule and Cost Control</td>
<td>Lead Contractor’s P3 Project Manager</td>
<td>O&amp;M Manager</td>
</tr>
<tr>
<td>Design Solutions</td>
<td>Design Manager</td>
<td>N/A</td>
</tr>
<tr>
<td>Construction Solutions</td>
<td>Lead Contractor’s P3 Project Manager</td>
<td>O&amp;M Manager</td>
</tr>
<tr>
<td>Lifecycle Cost Plan</td>
<td>O&amp;M Manager</td>
<td>N/A</td>
</tr>
<tr>
<td>Day-to-Day Operations</td>
<td>Developer’s P3 Project Manager</td>
<td>O&amp;M Manager</td>
</tr>
</tbody>
</table>

We will proactively prevent disputes by committing to the following contractual benefits:

- 60-day Service Commencement Notice
  - The Developer will provide the Department with Service Commencement written notice at least 60 days, instead of 21 days, prior to the anticipated Service Commencement Date
- 1-Month Early Plans, Metrics and Systems
  - The Developer will submit the O&M Plan and Performance Requirements Baseline tables and implement the Maintenance Management System three months before Service Commencement
- 1-month Early Training
  - The Developer will provide the Department with the required training at least three months prior to the Service Commencement Date
- Early Construction Dispute Resolution
  - We commit to resolve any and all construction disputes between the Lead Contractor, Developer and the Department prior to Service Commencement.

TABLE 4.1.5-5 Avoiding Disputes

<table>
<thead>
<tr>
<th>Potential Disputes</th>
<th>Resolution Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Disputes</td>
<td>Material issues will be discussed between Developer and Lead Contractor in a Dispute Review Board, formed by executive level management, through good faith negotiations.</td>
</tr>
<tr>
<td>Trade Subcontractor Disputes</td>
<td>Proactive dispute resolution measures include self-performing key trades, a thorough procurement process, early trade involvement, and diligent contract management.</td>
</tr>
<tr>
<td>WMATA Disputes</td>
<td>Our working relationship with WMATA will benefit from all of the organizational systems explained that contribute to issue prevention.</td>
</tr>
<tr>
<td>Disputes with the Department</td>
<td>Parties will attempt to resolve disputes with good faith negotiations between designated representatives.</td>
</tr>
</tbody>
</table>

We will proactively prevent disputes by committing to the following contractual benefits:
C. LINES OF COMMUNICATION

Communication Protocol

Our team is structured to provide effective communication and eliminate disputes through the suborganizations dedicated to 13 key aspects of the Project. (See 4.1.1) Our organizational systems for cross-suborganization communication include a systematic approach to meetings, detailed Project Development Plans and co-locating personnel.

Systematic Approach to Meetings

Our suborganizations will conduct face-to-face meetings to jointly discuss matters that impact multiple Project functions in an effort to prevent issues from arising. Table 4.1.5-6 outlines our approach for different meeting topics.

Table 4.1.5-6 Systematic Face-to-Face Meetings

<table>
<thead>
<tr>
<th>Topic</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Coordination</td>
<td>Weekly</td>
</tr>
<tr>
<td>Lead Contractor’s P3 Project Manager</td>
<td></td>
</tr>
<tr>
<td>Design Build Coordinators</td>
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<tr>
<td>Discipline Leads</td>
<td></td>
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<tr>
<td>WMATA Project Manager</td>
<td></td>
</tr>
<tr>
<td>Lead Quality Manager</td>
<td></td>
</tr>
<tr>
<td>Over the Shoulder Reviews</td>
<td>Prior to Formal Submissions</td>
</tr>
<tr>
<td>VDOT</td>
<td></td>
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<tr>
<td>WMATA</td>
<td></td>
</tr>
<tr>
<td>Lead Contractor’s P3 Project Manager</td>
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<tr>
<td>Disciplines</td>
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<tr>
<td>Construction Manager</td>
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<tr>
<td>Discipline Leads</td>
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<tr>
<td>Lead Quality Manager</td>
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<tr>
<td>Lead QC Inspectors</td>
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<tr>
<td>Design Manager</td>
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<tr>
<td>Design QC Team</td>
<td></td>
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<tr>
<td>Construction Manager</td>
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<tr>
<td>Look-Ahead Schedules</td>
<td>Weekly</td>
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<td>VDOT</td>
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<tr>
<td>WMATA</td>
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<tr>
<td>Lead Contractor’s P3 Project Manager</td>
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<td>Segment Managers</td>
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<td>Traffic Manager</td>
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<td>Project Controls Manager</td>
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<td>VDOT</td>
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<td>WMATA</td>
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<td>Lead Contractor’s P3 Project Manager</td>
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<td>O&amp;M Manager</td>
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<tr>
<td>Segment Managers</td>
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<tr>
<td>Traffic Manager</td>
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<tr>
<td>QC and QA Personnel</td>
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<td>Field Superintendents</td>
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<td>Segments Safety Managers</td>
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<td>Subcontractors</td>
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<td>Public Information Actions</td>
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<td>VDOT</td>
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<td>WMATA</td>
<td></td>
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<tr>
<td>Lead Contractor’s P3 Project Manager</td>
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<td>O&amp;M Manager</td>
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<td>Segment Managers</td>
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<td>Traffic Manager</td>
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<td>QC and QA Personnel</td>
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<td>Public Information Coordinator</td>
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<td>O&amp;M Manager</td>
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<td>MOT Manager</td>
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<td>Public Information Coordinator</td>
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<tr>
<td>Lead Contractor’s P3 Project Manager</td>
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<tr>
<td>Developer’s P3 Project Manager</td>
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<tr>
<td>Lead Contractor’s P3 Project Manager</td>
<td></td>
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<tr>
<td>Developer’s Board of Directors</td>
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</tr>
<tr>
<td>Important People</td>
<td></td>
</tr>
<tr>
<td>Select leaders and members of the sub-organizations listed in Table 4.1.5-1.</td>
<td></td>
</tr>
</tbody>
</table>

Key Team Interfaces

FIGURE 4.1.5-2 Key Team Interfaces

- Developer’s Infrastructure Manager
- Lead Contractor’s P3 Project Manager
- Corporate Affairs and Public Information
- Construction Manager
- Senior Director of ETM Systems & Toll Operations
- Traffic and Revenue Manager
- Toll Operations Team
- Construction Manager
- Segment Managers
- Subcontractors and Suppliers
- Training on organizational, safety and quality procedures
- Review Project Development Plans
- Ensure commitment to the Project Schedule
**PROJECT DEVELOPMENT PLANS**

I-66 Express Mobility Partners will provide Project Development Plans (PDPs) that comply with the Technical Requirements. To exceed the requirements and enhance communication between our team and with the Department, we will provide Project Development Plans not required by the Technical Requirements including a Risk Management Plan, O&M Quality Management Plan, Emergency Evacuation Plan, and Ethical Standards of Conduct. In order to continually monitor and improve the effectiveness of PDPs, a single owner will develop, review, update and implement each plan. Plan owners will communicate with field personnel to discuss potential revisions that reflect the best practices implemented on the Project site.

**D. INDEPENDENT QUALITY PROCESS**

**Quality Systems**

Our Quality Management System is the primary organizational system to ensure clear independence between quality control and quality assurance responsibilities. Additional information on our quality organizational structure is shown in 4.1.1.a. Additional information on our quality processes is provided in 4.2.3 and 4.3.3. RK&K will serve as the Quality Assurance Firm with experience managing and overseeing quality on $3 billion in VDOT projects following the Department’s minimum standards for QA and QC on Design-Build and P3 projects:

- **Elizabeth River Tunnels Project**, Portsmouth: RK&K is responsible to oversee the Design-Builder’s QA and QC functions for this $2.2 billion PPTA project
- **I-64 Widening**, Henrico County: RK&K performed Quality Assurance and developed the Quality Assurance and Quality Control Plan for the widening of I-64 to a six lane divided freeway
- **I-81 Truck Climbing Lanes**, Rockbridge County: As the Quality Assurance Manager, RK&K coordinated between the contractor, VDOT and various public agencies for this 7.2-mile widening project

**E. INTERFACING WITH THE DEPARTMENT/STAKEHOLDERS**

**Partnering Methods**

Our interface with the Department, its consultants, WMATA, third parties, and regulatory agencies will begin with an effective partnership between our organization and the Department’s team focused on maximizing customer and owner satisfaction. Our team members have successful experience with both formal and informal partnering methods, and plan to discuss with the Department their preferred level of formalized partnering sessions based on our philosophy that partnering is a daily responsibility to maintain focus on achieving the Project’s goals.
**Organizational Alignment**

Our preliminary alignment strategy will be refined during partnering sessions to enhance communication and prevent disputes. We propose to eliminate a single point of contact by creating strategic alignments between our organization and the Department, as shown below, during the daily interface required in the Design-Build phase and at Service Commencement.

### I-66 Express Mobility Partners Suborganization

**The Department and other Third Parties**

- **Developer’s P3 Project Manager’s Office**
  - I-66 Program Manager
- **Lead Contractor’s P3 Project Manager’s Office**
  - I-66 Program Manager

**Construction Management**

- Construction Management
  - District Construction Engineer
  - Area Construction Engineers
  - NOVA Mega Projects Management Staff
  - Construction Managers
- Construction Management (WMATA Project)
  - WMATA Primary Project Liaison
- Construction Management (Maintenance of Traffic)
  - Contract Administrators and Inspectors
  - Lane Closure Management Team
  - Traffic Information Coordinator
  - GEC Lane Closure and MOT Coordination
  - State Police TMC (VDOT’s Traffic Operations Center)
  - Media and Public Affairs Department

**Design**

- Design (WMATA Project)
  - WMATA Primary Project Liaison

**Health, Safety and Environmental**

- Environmental Engineer
- Permitting Agencies
- Environmental and Permit Monitors

**Risk Management and Project Controls**

- VDOT Legal Department
- VDOT’s GEC Team

**Operations and Maintenance**

- Virginia Department of Rail and Public Transportation

**Right-of-Way**

- VDOT ROW Manager
- VDOT’s On-Call Consultant

**Corporate Affairs and Public Information**

- Media and Public Affairs Department

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**Interface Methods**

We will use a standard set of interface methods with the Department and stakeholders that will be customized to the needs of the Project; each method will support early and often communication.

### Interface Methods

- Preconstruction meeting
- Weekly meetings to review commercial matters
- Monthly progress meetings
- TWG meetings and Over the Shoulder Reviews
- Submittal Status Review Meetings
- Host open houses with representatives from local government and other stakeholders
- Stakeholder Round Tables to ensure all stakeholders are addressed and incorporated in the work plan

**EDMS Software**

- Meeting minutes, action items, discussion topics, resolutions and timeframes for open items
- Inquiries and complaints log with initial and final responses to all inquiries and complaints
- A weekly, 60-day forward-looking schedule of communication and consultation events
- Communications resources including photographs and live-feed of the construction
- Crisis communications resources, including a detailed outline for crisis situation response, key messages for media response and checklists

**Co-location**

- Key staff during the Design-Build phase will be co-located with each other and the Department to encourage daily one-on-one communication, impromptu meetings, and shared access to all project information

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**Planned Transportation/Utility Infrastructure**

Our aligned strategy and interface methods will enhance our interface with the various agencies such as transit providers, WMATA, Park-and-Ride operators and Utility Owners, and it will be streamlined due to the numerous impacts our design avoids in relation to planned transportation and utility infrastructure.

### Impacts Avoided through Design

- WMATA risk has been reduced by retrofitting or keeping the pedestrian bridges in place, keeping the TPSS in its current location and accommodating the 42 foot WMATA median at all new crossings in the corridor (See 4.2.2.2 and 4.2.2.3)
- The Park & Ride Facilities were designed to completely avoid wetland impacts (See 4.2.2.2)
- Bus transportation and the general traveling public was accommodated in our traffic management plan with zero detours, zero I-495 Express Lanes closures, and simplified traffic shifts (See 4.2.2)

---

**Utility Infrastructure**

- Our current design avoids 57 of the 330 potential utility impacts in the corridor (See 4.2.4)
- We designed innovations that provide schedule and costs savings after thorough investigation of existing utility conditions and effective interface between Utility Management and Design teams (See 4.2.4)
- As part of the stakeholder meetings organized by the Department during the RFP phase, we met with key Utility Owners including Fairfax County Water and Sewer, Prince William County Service Authority, Dominion and Verizon to discuss avoiding impacts (See 4.2.4)
4.1.6 PUBLIC INFORMATION AND COMMUNICATIONS

I-66 Express Mobility Partners will build enduring relationships with stakeholders and communities through continuous communication about construction impacts and the long-term benefits of the Project. Our team’s in-depth knowledge of the communities informed our Communications Plan and will ensure communication measures are crafted to align with the diverse composition of the I-66 corridor communities.

A. QUALIFICATIONS OF STAFF

Our Corporate Affairs and Public Information suborganization is responsible for coordinating all communication and public outreach efforts. Their qualifications are summarized below.

Director of Corporate Affairs: CONFIDENTIAL AND PROPRIETARY INFORMATION REDACTED

Director of Marketing: CONFIDENTIAL AND PROPRIETARY INFORMATION REDACTED

Public Information Coordinator: CONFIDENTIAL AND PROPRIETARY INFORMATION REDACTED

Additional Staff: Our suborganization will also include a team of communications professionals with experience on similar roadway projects locally and across the U.S. Their ability to develop a range of outreach and communication messages and materials for stakeholders, media, and the community will directly benefit the Project.

FIGURE 4.1.6-1 Creative User Features and Systematic Feedback and Tracking Mechanisms

<table>
<thead>
<tr>
<th>Creative User Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive On Mobile Application</td>
</tr>
<tr>
<td>Facebook</td>
</tr>
<tr>
<td>Twitter</td>
</tr>
<tr>
<td>Periscope</td>
</tr>
<tr>
<td>Text Messaging</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Systematic Feedback and Tracking Mechanisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC QUERY LOG</td>
</tr>
</tbody>
</table>

- The Public Query Log will track and organize stakeholder feedback gained through a diverse range of collection methods (shown below) to improve stakeholder engagement on the Project.

- Our Corporate Affairs and Public Information suborganization will monitor the Public Query Log and present feedback to the team for consideration and implementation.

- Design Public Hearing
- Traveling Open Houses
- Tele-Town Halls
- Benchmark Polling
- Website Questions/Comments
- Visitor Center
- Periodic Tracker Polls
- Social Media Questions/Comments
- Telephone Hotline
- Meeting Booths/Pop-up Events
- Door-to-Door Outreach
B. PRELIMINARY COMMUNICATIONS PLAN

I-66 Express Mobility Partners’ Communications Plan will be implemented in collaboration with the Department to ensure all strategies are consistent with collective values, needs and goals.

The management protocols shown in Table 4.1.6-1 will enhance coordination between our Corporate Affairs and Public Information suborganization and the Department’s communications team. All efforts will be approved by the Department and executed as one team, and all meetings and public interface required by federal and state law will be conducted in accordance with the current version of the Department’s Policy Manual for Public Participation in Transportation Projects.

Outreach Initiatives

I-66 Express Mobility Partners will maximize public awareness through a multi-faceted approach that includes a dedicated plan for elected official and agency outreach, diverse communication methods and a continuous community engagement approach.

ELECTED OFFICIAL AND AGENCY OUTREACH

Our comprehensive Elected Official and Agency Outreach Plan will include statewide officials, members of the House of Delegates, county and municipal offices, and provide considerations for the 2017 election cycle, during which the Project is likely to be discussed. To maintain continued support from outgoing officials and gain the support of incoming officials, the Project will need to be viewed as a victory for the Commonwealth and for the people of Northern Virginia.

Acknowledging that the Project will likely be a political hot-topic as campaigning begins, our plan includes a comprehensive public relations, communications and grassroots outreach effort to help frame the political discussion proactively and minimize or neutralize opposition messaging. Our Corporate Affairs and Public Information suborganization will provide the planning necessary to support the Department in an effective elected official and agency outreach. Specific elements of the plan may include:

- Quarterly County/Municipality update meetings and calls with local elected officials and agency heads
- Project Twitter and Facebook accounts that will “follow”/“like” local elected officials/key influencers
- Inclusion of all impacted elected leadership in all press announcement/media advisory distribution lists
- Quarterly meetings and individual calls with legislators and regional agency heads
- Quarterly traveling open houses in each county/municipality including communications officials and subject matter experts with invitations to elected leadership
- Monthly updates and month-ahead updates via direct mail and email correspondence
- Rapid response and follow up with tailored information for every elected/agency that makes inquiries understanding the elected officials have constituents with a variety of concerns

<table>
<thead>
<tr>
<th>TABLE 4.1.6-1 Management Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting to the Department</td>
</tr>
<tr>
<td>Weekly phone calls will update the Department about the Project’s ongoing status and written monthly reports will be submitted to the Department, if requested.</td>
</tr>
<tr>
<td>Media</td>
</tr>
<tr>
<td>A matrix will allocate responsibilities based on the type of media request or outreach being performed. All media inquiries and outreach efforts will be reviewed with the Department.</td>
</tr>
<tr>
<td>Stakeholder Relations</td>
</tr>
<tr>
<td>A formalized schedule will be created to continuously brief stakeholders on the Project which will also identify attendees and responsibilities in terms of the information exchange.</td>
</tr>
<tr>
<td>Materials</td>
</tr>
<tr>
<td>All I-66 Express Mobility Partners generated marketing, communications and outreach materials will be submitted to the Department for approval prior to distribution.</td>
</tr>
<tr>
<td>Emergency Response</td>
</tr>
<tr>
<td>We will develop crisis communication procedures in conjunction with the Department that alert appropriate responders, media and the community, as necessary.</td>
</tr>
</tbody>
</table>
COMMUNICATION METHODS

TABLE 4.1.6-2  Stakeholder Communication Methods

<table>
<thead>
<tr>
<th>Stakeholder Group</th>
<th>Primary Method</th>
<th>Secondary Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traveling Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeowners/Residents</td>
<td></td>
<td></td>
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<tr>
<td>Environmental Groups/Parks</td>
<td></td>
<td></td>
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<tr>
<td>Businesses/Chambers of Commerce</td>
<td></td>
<td></td>
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<tr>
<td>Educational Institutions</td>
<td></td>
<td></td>
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<tr>
<td>Labor Groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elected Official</td>
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</tbody>
</table>

TABLE 4.1.6-3  Communicating Construction Impacts

A major focus of our plan is communicating construction impacts to maximize safety. The types of information that we will provide will include traffic shifts, potential traffic delays, schedule information, construction activities and the benefits of the Project. This information will be shared through a variety of methods outlined below.

<table>
<thead>
<tr>
<th>Project Website</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Radio Announcements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-Houses/Tele-Town Halls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visitor Center</td>
<td></td>
<td></td>
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<tr>
<td>Social Media</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE 4.1.6-4  Custom Communication Solutions

Our comprehensive communication methods also recognize that concerns vary in different communities, which will influence custom communications. For example, the communities towards the west may be more concerned with toll rates and commute times while those towards the east may also be concerned with bike lanes, multi-modal options and the Project’s impact on their walkable communities. We will work with the Department to further align concerns with specific communities. Our preliminary custom solutions are outlined below.

- **Metro Users**: Our primary communication methods for WMATA users include geo-coded digital advertising and handouts at each station. The geo-coded digital advertising campaign will ensure those commuters within a 1-mile radius of impacted stops are aware of construction impacts. Our team will hand out informational brochures as commuters enter the station to provide the schedule information in advance of construction activities. To strengthen in-person communications, we will also have an Informational Booth outside affected stops where commuters can voice concerns and discuss our potential solutions. We will also share information with WMATA for them to add to their website and social media, if approved by the Department.

- **Elementary Schools**: Stewwood Elementary is one of many schools that require targeted communication efforts to address concerns from the school's administration and the students’ parents. The primary communication methods will include Tele-Town Hall Meetings and door-to-door canvassing. Secondary communication methods will include informational brochures developed in collaboration with the school's administration that can be distributed to students and available for parents to pick up at the school's office.

- **Community Organizations**: We will implement grassroots engagement methods as a method to communicate with community-established organizations such as Home Owners Associations in Fairfax and Loudoun County, local rotary clubs, Transform 66 Wally, Chesapeake Climate Action Network, Coalition for Smarter Growth, Fairfax Advocates for Better Bicycling, Herndon Environmental Network and Fairfax County Restoration Project. We will create and monitor a question/comment area of the site to monitor feedback.

- **Businesses**: To communicate with businesses, we will partner with the Dulles Regional Chamber of Commerce, the Loudoun County, Fairfax County and Prince William Chambers of Commerce, and the Northern Virginia Technology Council by conducting standalone meetings with the organizational leadership and transportation committees to address their concerns, as well as the impacts to their businesses. Our team can share email blasts with these organizations to be distributed to member businesses.

- **Visitor Center**: Our team will host open houses and tele-town halls to communicate construction impacts. The Tele-town halls provide a unique opportunity for stakeholder groups with busy schedules to participate remotely in dialogue about construction impacts. We will establish a presence during special pop-up events to reach a broad spectrum of the traveling public that might not otherwise know about the Project.

- **Economic Development Program**: 1-66 Express Mobility Partners will implement an economic development program similar to what Cintra, Meridiam and Ferrovial Agroman implemented on the LBJ Express project. They met with more than 800 local businesses along the corridor to understand their concerns regarding construction impacts. In response, the LBJ Marketplace was established to promote local businesses with an online marketplace and loyalty discount cards. Businesses in the heart of the construction zone reported increased sales. For this effort, the project was awarded PR Daily’s Corporate Social Responsibility Award for having the Best Stakeholder Outreach in 2012. We will also consider partnering with a local business to develop a radio advertisement that promotes the Project and their business. This would give the business free advertising and demonstrate support from the business community.
COMMUNITY ENGAGEMENT PROGRAM
I-66 Express Mobility Partners is committed to discussing design approaches with the community to ensure the Project has an aesthetic appeal. Building off of the Department’s previous efforts, our team will formally begin engaging the community at the Design Public Hearing where we will present the Preliminary Design. Comments will be received from the community and integrated into the design, as appropriate. Those attending the meeting will also be able to vote between aesthetic treatments for the retaining and noise walls. The treatment with the most votes will be highly considered for implementation.

During construction, regularly scheduled traveling open houses with communications professionals and subject matter experts will be held to discuss measures to reduce impacts, including dust and noise mitigation, detours and general public safety. The use of tele-town halls, mobile phone applications, text messaging and social media will allow the community to actively engage remotely to accommodate their busy schedules.

Open houses will be scheduled at various times of the day and night, and at various locations throughout the corridor to allow community members with different schedules to participate. We will also reach out to local businesses and residents to fill construction-related jobs. Further explained in 4.1.7 Project Labor Strategy, we commit to the 75 percent local and veteran new hire goal to positively impact the community.

Media Relations
I-66 Express Mobility Partners will support the Department in implementing a targeted, well-managed earned media and paid-advertising program to inform the public about construction-related issues and timelines throughout the Project. Our proactive Media Relations Plan will include:

» Meetings with local editorial boards, primary television and radio stations such as WTOP 103.5, and key bloggers such as WTOP Dr. Gridlock Blog to cover overall goals and anticipated public impacts

» Developing an online media room with background information, photography, timelines and other information, as well as a form for media outlets to register to receive traffic management information

» Identifying and arranging events to generate media coverage and raise the profile of the Project, such as groundbreaking ceremonies, Project milestones and the opening of the Project office in the area

» Weekly newsletters with construction updates will be emailed to local reporters and posted to Facebook, Twitter and the Project website

We will maintain a press tracker site that will monitor media coverage with respect to Northern Virginia, I-66 and tolling, among others. Media requests will be acknowledged and the Department’s representative will be contacted immediately. All media inquiries will be logged with resulting media coverage.

<table>
<thead>
<tr>
<th>Media Outreach Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-66 Express Mobility Partners will complete a comprehensive media outreach program that includes the media outlets listed below. Significant efforts will be developed to create partnerships with traffic reporters, and television and radio stations.</td>
</tr>
<tr>
<td>» WNVT TV 30</td>
</tr>
<tr>
<td>» WTOP 103.5 and WTOP Dr. Gridlock blog</td>
</tr>
<tr>
<td>» Washington Post and Washington Post Express</td>
</tr>
<tr>
<td>» Washington Times</td>
</tr>
<tr>
<td>» Washington Examiner</td>
</tr>
<tr>
<td>» Fairfax, Fairfax Station, Vienna and McLean Connection</td>
</tr>
<tr>
<td>» Fairfax County Times</td>
</tr>
<tr>
<td>» Falls Church NewsPress</td>
</tr>
<tr>
<td>» Northern Virginia Magazine</td>
</tr>
<tr>
<td>» Potomac Local News</td>
</tr>
<tr>
<td>» Prince William Times</td>
</tr>
<tr>
<td>» Journal of Loudoun County</td>
</tr>
<tr>
<td>» Loudoun Times-Mirror</td>
</tr>
<tr>
<td>» InsideNOVA</td>
</tr>
</tbody>
</table>
Express Lanes Communication and Marketing Campaign

No less than 12 months prior to the Service Commencement, we will implement a public education and marketing program to educate motorists about the features of the Project and how the Express Lanes work. This will include working closely with the Department and the Transform 66 Inside the Beltway project to provide detailed information on the conversion from HOV-2 to HOV-3, and how the new rules will impact ridership. We acknowledge that most residents along the corridor are familiar with E-ZPass because of its regional implementation. Open houses will provide an opportunity for those that are not as familiar to learn about the Express Lanes, the HOV-2 to HOV-3 conversion, obtain a transponder and ask questions.

We will also dedicate a liaison to work with the Virginia Department of Rail and Public Transportation to increase awareness about the benefits of using the Park & Ride facilities. Our campaign will communicate improved travel times for people that use the Park & Rides through HOV access to the Express Lanes.

MARKETING/PROJECT BRANDING

We will develop a strong and enduring brand presence through engaging graphics and artwork to support the Project brand identity. The graphics and artwork will be consistent with the branding used on other Express Lane systems in Northern Virginia and will be submitted to the Department for approval. Market research will be conducted to guide all marketing and communication activities.

We will conduct benchmark polling to identify key message points that will frame prospective messaging and branding. Additionally, we will conduct periodic tracker polls to continually improve the end product, gauge public feedback, and identify strengths and weaknesses in public perception. Messaging will be retooled as needed to incorporate our findings. During construction, our team will continuously track polls to gauge public opinion, and use the results to bolster public perception.

FIGURE 4.1.6-2  Express Lanes Website

A customer-facing website will be developed to inform the public about the Express Lanes’ operations and provide educational information about the driver information systems in use so motorists can learn about the on-road sources of information that will facilitate choice and lane control signals.

FIGURE 4.1.6-1  Drive On Mobile Application

This Cintra-developed application will improve engagement through promotion of discounts, payment options, maps, alerts and more.
4.1.7 PROJECT LABOR STRATEGY

A. ATTRACTING SKILLED LABOR

Our strategy to attract sufficient skilled construction craft personnel is to implement a combination of self-performed work, local hiring initiatives, and existing contractor network engagement.

Self-Perform

We initially plan to self-perform critical scopes with in-house and direct-hired labor forces to mitigate challenges obtaining regional skilled construction craft. The Lead Contractor is positioned to self-perform traffic control, structures, utilities, drainage and erosion control. Additionally, Allan Myers is one of the largest civil construction and materials company in the region since 1967.

Local Hiring

Given the complexity of the Project and other heavy civil construction projects in the region, we have planned ahead to ensure adequate labor resources are available to execute the work over the duration of the Project. We have had meetings and have existing partnerships with multiple entities representing both union and merit-shop labor, including: Virginia Chapter of Association Builders and Contractors (ABC), Laborers International Union of North America (LIUNA), Cheshil Consultants, Inc. (CCI), Associated General Contractors (AGC), National Center for Construction Education and Research (NCCER), the Virginia Employment Commission (VEC), and Helmets to Hardhats (H2H).

Through this effort, we have determined the market has ample resources to meet our aggressive schedule and perform to our high quality expectations when our training and hiring strategies are applied.

Cheshil Consultants, Inc. (CCI)

CCI brings more than 25 years of experience including innovative initiatives for the Dulles Metro Silver Line Project Phase I and the Phase II. More than 62% of the jobs posted were filled by job seekers through the job portal website developed for the project.

A similar job portal website will be developed to:
» Increase targeted outreach to local organizations
» Track communication with partners
» Empower a larger pool of Disadvantaged Business Enterprises (DBE) and Small, Women-owned, and Minority-owned Businesses (SWaM) to participate by matching them up to opportunities
» Organize compliance monitoring processes with Project goals and payroll labor laws

Self-Perform and Local Hiring Experience

On the LBJ Express Project, Ferrovial Agroman self-performed the maintenance of traffic and more than $200 million of structures construction with more than 150 professionals hired and trained by the design-build team. For the US 301 project in Delaware, Allan Myers participated in a project-specific job fair resulted in 130 applicants and approximately 50 hires for construction crafts including equipment operations, truck drivers, carpenters, general and paving laborers.
The support and engagement of the entire local contracting community of both merit-shop and union contractors is critical to the success of the Project. We will work with the local industry, partnering with local subcontractors, to leverage their local expertise.

This mutually beneficial strategy brings jobs to the local community and a cost-effective approach to Project execution. We will also engage educational institutions including George Mason University, Virginia International University, ECPI University, Lord Fairfax Community College Workforce Solutions and ONLC Training Centers to offer local jobs and training programs.

Based on the timing of this Project in conjunction with other large-scale projects in the region, our team will carefully assess subcontractor availability and make selections considering each subcontractors’ resource availability to maintain the Project’s schedule. Contractor selection will be finalized two months ahead of specific work packages to coordinate efforts, quality, and safety planning.

The major scopes of work that will be supported by the local and regional subcontracting network include asphalt paving, pavement demolition, slipform barrier, soundwall, MSE walls, retaining walls, signage, pavement markings, guardrail, electrical, and drainage. Outreach efforts have identified the contractors listed in Table 4.1.7-1.

### Table 4.1.7-1: Main Potential Subcontractors and Suppliers by Trade (*DBE; **SWaM)

<table>
<thead>
<tr>
<th>Scope</th>
<th>Company Name</th>
<th>Company Name</th>
<th>Company Name</th>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asphalt and Concrete Paving</strong></td>
<td>Virginia Paving</td>
<td>Joseph B Fay</td>
<td>Bryant-Ritter*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Superior Paving</td>
<td>Wagman</td>
<td>Franco's Bridge</td>
<td></td>
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<tr>
<td></td>
<td>Branscome Paving</td>
<td>Sema Construction</td>
<td>VA Sign &amp; Lighting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Luck Stone Corp.</td>
<td>Zachry Construction</td>
<td>Midasco</td>
<td></td>
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<tr>
<td></td>
<td>Vulcan Materials</td>
<td>CP&amp;P</td>
<td>Electrifiers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Titan America</td>
<td>Old Castle</td>
<td>Bruce &amp; Merrilees</td>
<td></td>
</tr>
<tr>
<td><strong>Concrete Demolition</strong></td>
<td>M&amp;F*</td>
<td>Williams Industries, Inc.</td>
<td>LS Lee</td>
<td></td>
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<tr>
<td></td>
<td>John Simpson**</td>
<td></td>
<td>Long Fence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Atlantic Breakers</td>
<td></td>
<td>Mack</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical</strong></td>
<td>Eure Inc*</td>
<td>Joseph B Fay</td>
<td>Carolina Guardrail</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bryant-Ritter*</td>
<td>Demolition Services</td>
<td>Nickelston*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bruce &amp; Merrilees</td>
<td>Tysons Demolition</td>
<td>A Annandale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VA Sign &amp; Lighting</td>
<td></td>
<td>Preferred Services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Midasco</td>
<td>Reinforced Earth Co</td>
<td>Sandras Marking*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrifiers</td>
<td>McGee Mobile Crane*</td>
<td>Eure Traffic</td>
<td></td>
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<tr>
<td></td>
<td>Highground Servcies, Inc.</td>
<td>Berkel</td>
<td>Paynes Parking</td>
<td></td>
</tr>
<tr>
<td><strong>Soundwall</strong></td>
<td>Joseph B Fay</td>
<td>Sine Wall</td>
<td>Tavares*</td>
<td></td>
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<tr>
<td></td>
<td>Terra Site*</td>
<td>Lane</td>
<td>Denbigh</td>
<td></td>
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<tr>
<td></td>
<td>Sine Wall</td>
<td>Terra Site*</td>
<td>Blount &amp; Sanford</td>
<td></td>
</tr>
<tr>
<td></td>
<td>McGee Mobile Crane*</td>
<td>Calffee</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pavement Markings</strong></td>
<td></td>
<td>J.R. Caskey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It may be necessary to support the local contracting community with resources from other regions. Contractor support organizations such as ABC and AGC will be helpful to identify and solicit contractors from other regions. We will facilitate DBE and SWaM participation by providing outreach, mentoring and on-the-job training program opportunities. DBE Coordinator, Angela Berry-Roberson, will work closely with procurement staff to conduct extensive outreach, promote awareness, and monitor contract compliance. Angela brings 20 years of experience in DBE program compliance and management, specifically on large transportation infrastructure projects. She is currently serving as the DBE Manager on a $1 billion project in Dallas, Texas where she is responsible for the DBE strategy and verifying OJT and EEO compliance. She received TxDOT’s Civil Rights Office Small Business Advocacy award for her efforts on the NTE and LBJ Express projects.

In addition to the outreach event hosted by the Department, we hosted our own outreach event on June 23, 2016 at Allan Myers office in Fairfax. These events connected us with more than 150 local subcontractors and suppliers. We spoke with these businesses about our process including smaller bid packages to increase opportunity during the Design-Build phase and providing O&M training. As conveyed in Table 4.1.7-1, we have identified a pool of DBE and SWaM firms for key construction services. We anticipate utilizing DBE and SWaM firms throughout the duration of the Project to perform services such as demolition, signage, electrical, landscaping, rebar installation, and trucking as well as O&M activities.

Our team will utilize resources like Helmets to Hardhats, the Virginia Employment Commission (VEC) services, and the Virginia Workforce Connection Job Seeker to identify qualified veteran candidates and achieve the local and/or veteran new hire participation goals for the Project. The VEC has a local office in Alexandria which can support the Project. Currently, Job Seeker has over 120 veteran candidates in the construction occupation group.

**B. CRAFT TRAINING, BENEFITS AND SKILLS RETENTION**

Given the large volume of similar infrastructure projects in the region, supplemental craft training, competitive worker benefits, and supporting critical skills retention are important to maintain an adequate labor supply for the Project. The Lead Contractor will provide a great place to work, providing competitive pay and benefits programs, implementing rules and practices that treat employees with dignity and equality, and maintaining compliance with employment and labor laws.

**Craft Training**

Worker training and critical skill development will be assessed and supported through pre-employment skills assessments, classroom training, on-the-job training, industry training programs, and apprenticeships for new hires and entry level workers. Our team members provide industry safety training for new hires which includes OSHA training, hazard communication, first aid/CPR, and flagger

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**FIGURE 4.1.7-2  DBE/SWaM Commitment**

We commit to achieve the DBE, SWaM, and Veteran and Local hiring goals outlined below. Additionally, we have provided our recent success with DBE and Local contracting goals on the NTE 1 and 2 and LBJ Express projects.

<table>
<thead>
<tr>
<th>Goal</th>
<th>NTE 1 AND 2</th>
<th>LBJ EXPRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBE Goal</td>
<td>$128M</td>
<td>$178M</td>
</tr>
<tr>
<td>DBE Result</td>
<td>$210M</td>
<td>$290M</td>
</tr>
<tr>
<td>DBE Contracts</td>
<td>193</td>
<td>222</td>
</tr>
<tr>
<td>Local Companies</td>
<td>117</td>
<td>100</td>
</tr>
<tr>
<td>People Hired</td>
<td>1,700</td>
<td>1,900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goal</th>
<th>NTE 1 AND 2</th>
<th>LBJ EXPRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>15% GOAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27% GOAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75% GOAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWaM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veteran/Local</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TRANSFORM I-66 GOALS**

- **15%** GOAL
- **27%** GOAL
- **75%** GOAL

- **1** DBE
- **2** SWaM
- **3** Veteran/Local

---

**TABLE 4.1.7-1**

<table>
<thead>
<tr>
<th>Goal</th>
<th>NTE 1 AND 2</th>
<th>LBJ EXPRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBE Goal Result</td>
<td>$128M</td>
<td>$178M</td>
</tr>
<tr>
<td>Local Companies</td>
<td>117</td>
<td>100</td>
</tr>
<tr>
<td>People Hired</td>
<td>1,700</td>
<td>1,900</td>
</tr>
<tr>
<td>DBE Goal Result</td>
<td>$210M</td>
<td>$290M</td>
</tr>
<tr>
<td>Local Companies</td>
<td>117</td>
<td>100</td>
</tr>
<tr>
<td>People Hired</td>
<td>1,700</td>
<td>1,900</td>
</tr>
</tbody>
</table>

---

**POSITIVE IMPACT** Our team will utilize resources like Helmets to Hardhats, the Virginia Employment Commission (VEC) services, and the Virginia Workforce Connection Job Seeker to identify qualified veteran candidates and achieve the local and/or veteran new hire participation goals for the Project. The VEC has a local office in Alexandria which can support the Project. Currently, Job Seeker has over 120 veteran candidates in the construction occupation group.
training. Additional employee training includes crane safety, rigging, confined space entry, smith driver, excavation competent person, and stormwater pollution prevention training. We will leverage our strong relationships with the Department, ABC, AGC and other local associations to complement our in-house training with comprehensive joint training programs. We routinely work with ABC for apprenticeship training, which is the largest national merit-shop apprenticeship training program. Resources that can be utilized for craft training and skill development on the Project include:

» ABC NCCER accredited apprenticeship programs
» AGC craft training database and merit-shop apprenticeship and craft training program
» NCCER curricula for more than 70 craft areas
» 14 NCCER-accredited training and assessment locations within 50 miles of the Project

As work packages are developed for subcontracted work elements, bid packages and contractual agreements will identify and include trainee requirements to support our team’s goals for the development of craft worker skills. Subcontractors will be required to submit manpower plans with their proposals, showing the number and classification of workers required, and therefore the number of targeted and disadvantaged workers required.

To support skilled craft and labor force development for critical work elements, on-site and off-site training programs will provide the education needed to safely perform job functions in an efficient manner and to progress work category skills. Our personnel will train on the technical aspects of specific trades including training for the use of any equipment required to perform the tasks. Comprehensive on-the-job training and apprenticeship programs will be customized for each trade.

**Worker Benefits**

Benefits for current and new hires for the Project will include paid holidays and vacation, medical coverage, disability programs, life insurance, legal counsel, flexible spending accounts, and retirement plans. Medical benefits include medical, dental, vision, and prescription drug coverage. Short-term disability and voluntary long term disability are offered to all employees. Optional programs for supplemental life insurance, flexible spending accounts, and 401(k) plans provide employees with high quality competitive benefits programs.

**Critical Skills Retention**

Our approach to craft training and growing a skilled workforce for the Project supports critical skill development and retention. Individual skills sets are assessed as part of the hiring process, and used as part of the project labor force assignment process to make sure the right individuals are assigned to the right work elements.

Deliberate on-the-job training programs support skill development and retention, and reinforce classroom training exercises. Formal apprenticeship programs for skilled labor, carpentry, operators, and truck drivers further support critical skill retention and employee development. In addition to individual skill retention, operational lessons learned will be shared within each work category and implemented to develop and improve upon the best practices established for the Project.

**Workforce Development**

On the LBJ Express project in Dallas, Ferrovial Agroman expanded the labor pool for bridge work. Working with subcontractors, they established two precast facilities to meet demand. They trained them to perform bridge work, expanding capacity and creating additional resources.

Establishing these facilities increased production, fabricating 2,500 beams and 1,500,000 square feet of panels within 24 months. These project-dedicated facilities allowed rapid adjustment to schedule changes, minimized equipment and personnel stoppages resulting from material shortages and eliminated conflicts with other projects outside our control.
4.2.1 DESIGN-BUILD MANAGEMENT

I-66 Express Mobility Partners’ design-build management approach is based on a work plan that will:
» Lower risk with realistic durations, early utilities and right-of-way (ROW) work and fast-tracked design
» Avoid subcontractor disputes by responsibly assessing capacity and qualifications, and managing contract changes proactively
» Develop an effective partnership with the Department with co-location and joint TWGs
» Reduce impacts on the traveling public and facilitate positive perception through a communications program tailored to each group along the corridor
» Create a zero incident culture which ensures public and worker safety throughout the Project

The Design-Build Team will implement processes documented in Project Development Plans for these primary design-build management activities:
» Design Management (See 4.2.1.a and b)
» Construction Management (See 4.2.1.c)
» Schedule and Cost Control (See 4.1.2)
» Environmental Protection (See 4.1.3)
» Safety and Health Management (See 4.1.4)
» Quality Management (See 4.2.3)

Our Design-Build Team will coordinate with the Department and Stakeholders to plan and implement each management activity. This coordination effort will allow the Department to properly allocate its resources for approvals and obtain a clear understanding of our work plan.

FIGURE 4.2.1-1 Design-Build Managers
Design-build management activities will be overseen by the Lead Contractor’s P3 Project Manager, Miguel Angel Alonso.

TABLE 4.2.1-1 Owner, Customer and Stakeholder Satisfaction
From November 2011 through February 2015, Ferrovial Agroman received two evaluations on the North Tarrant Express projects.

<table>
<thead>
<tr>
<th>Comprehensive Evaluation</th>
<th>Exceptional</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality/Technical (6 subcategories)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timeliness (4 subcategories)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost Control (2 subcategories)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Relations (6 subcategories)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I would recommend TxDOT hire this contractor in the future?

Strongly Agree ✓ 1 Agree ✓ 2

“NTI goes above and beyond to keep the contractors and the traveling public safe.” - Scott Hall, TxDOT Project Manager

“Team members are responsive and available. TxDOT appreciates the professional manner in which issues are addressed and resolved.” - Renee Lamb, TxDOT Project Manager

“Achieved Substantial Completion nine months ahead of schedule. Developer worked well with six Cities ... to ensure any outstanding issues were addressed.” - Renee Lamb, TxDOT Project Manager

Allan Myers has received the following feedback from VDOT:
“I’m pleased that VDOT, our design-build partner (Myers), the City ... could all join together so that this work could be done ... to provide the least amount of disruption to the residents and the businesses.” – Jim Utterback, VDOT Administrator

“[Myers] has facilitated open-ended discussions where the various stakeholders ... have had a chance to identify and evaluate issues that could impact the project, providing ... a positive avenue for the building of relationships among stakeholders.” - Don Lockard, VDOT Construction Manager
A. DESIGN MANAGEMENT

FIGURE 4.2.1-2 Management Approach for Development and Coordination of Design
A large part of our success in managing schedule risk is the result of a fast-tracked design approach. For the Project, we will implement fast-tracked methodologies to complete the design as scheduled: prioritizing critical design activities that impact construction start; Technical Work Groups that incorporate construction and O&M considerations into the design; and early and consistent Department integration.

- Prioritizing Critical Design Activities
  - Survey and Geotechnical Report
  - ROW Acquisition and Utility Relocation
  - Environmental Permitting
  - Maintenance of Traffic Plan

- Technical Work Groups (TWG)
  - Facilitate D-B and O&M coordination
  - Encourage real-time progress reviews
  - Expedite decision-making

- Department Integration
  - Open-door design coordination meetings
  - Over-the-Shoulder Reviews
  - Partnering and Co-location

We have already achieved 30% design completion, focusing on drainage, ROW and utilities. This fast-tracked approach will continue to advance the design to 60% by Financial Close.

Example Design Solutions by TWG Topic
- ROW: Eliminated three residential relocations at the I-495 interchange with an optimization of the southeast quadrant (See 4.2.2.2)
- Environmental: 100% impact avoidance to jurisdictional delineated wetlands at Park and Rides and detention ponds facilities (See 4.1.3)
- Utilities: Minimized/avoided 57 utility conflicts and lowered WMATA impacts with an ATC for Gallow Road Train Power Substation (See 4.2.4)
- Pavement: Provided CBR 5 for the subgrade in all segments, ramps and cross streets, exceeding the 2.5 requirement (See 4.2.2.5)
- WMATA: Minimized WMATA risk with ATCs at two stations by retrofitting or keeping in place the pedestrian bridges (See 4.2.2.6)

B. APPROACH FOR DELIVERING THE DESIGN FOR THE P3 PROJECT

FIGURE 4.2.1-3 An Integrated and Coordinated Approach to Delivering Design
Our Design-Build Coordination Manager will direct our lead engineers to control the integrated design-build process in conjunction with Bob Gray, P.E., our Design Manager. Our integrated design management approach considered the entirety of the design while focusing on exceeding requirements, and the specific risks that impact a multitude of design disciplines such as environmental permitting, ROW acquisition and the WMATA median.

- Design Coordination Tools
  - Co-location of Design Manager, discipline leads and construction personnel
  - Cloud-based access to document storage

- Accurate Submittals Procedures
  - Design Package Matrix with due dates
  - Design Package kick-off meetings
  - Weekly submittal status meetings
  - Quality reviews prior to submission

- Proven Design Organization Tools
  - Common Criteria Manual for consistency
  - BIM to enhance discipline coordination
  - TWGs for design-build/O&M solutions
  - Electronic Document Management System

The Design-Build Coordinators will continue to manage our design firms for consistency and quality, including reviewing submittals prior to submission.

Our submittal procedures will help the Department to analyze resource needs in alignment with the submittal schedule, thus enabling an efficient review and approval.

Our Lead Contractor has worked on six large-scale infrastructure projects with our design partners resulting in design organizational tools that have proven effective.

C. CONSTRUCTION MANAGEMENT

FIGURE 4.2.1-4 Management Approach for Construction
Our team’s comprehensive construction management approach will contribute to a successful Project and achievement of the Department’s specific schedule goals while minimizing construction impacts on the community and traveling public. Our Project Development Plans will direct the schedule and cost control systems explained in 4.1.2, and the design-build integration methods explained below.

- Successful Partnering with the Dept.
  - Formal Partnering kick-off meeting
  - Daily informal meetings
  - Monthly progress meetings
  - Quarterly formal Partnering meetings
  - Public communications strategy

- D-B Coordinators for D-B Integration
  - In-house design and construction experts
  - Co-locate at the Project site office
  - Participate in TWGs during construction

- Dividing and Controlling the Work
  - Segment Managers for each segment
  - Self-perform critical activities including traffic management, utilities and drainage
  - Pre-Activity meetings to manage the trades
  - Extensive subcontractor quality training

RESULTS: Our construction management approach and integration methods will deliver the following Project benefits:

- REDUCED SCHEDULE RISK
  - Extra crews for critical path items
  - Project-wide safety culture
  - ISO-certified quality plan

- ZERO ACCIDENTS
  - Early ROW and utility solutions
  - Pre-activity Hazard Analysis
  - Roadway Inspections

- LOWER COST
  - Forecasting material needs
  - Performance incentives
  - Lifecycle considerations

- EXTENDING PROJECT’S LIFE
  - Continuous outreach
  - Continuous compliance reporting
  - Appropriately-sized contracts

- CUSTOMER SATISFACTION
  - Design optimizations
  - Reduced construction impacts
  - Social media platforms

- 15% DBE
  - 27% SW M
  - 75% VETERAN & LOCAL HIRE
D. MANAGING CONSTRUCTION WITH O&M ACTIVITIES

The Lead Contractor will have operations and maintenance (O&M) crews on-site during the construction phase working in conjunction with the rest of the Design-Build Team. The on-site O&M crews during construction will integrate with the rest of the Design-Build Team to schedule and implement the ongoing O&M activities while simultaneously managing construction.

Coordination with the Department

During construction, the transfer of O&M responsibilities will be reviewed at weekly coordination meetings attended by our O&M crews, Segment Managers and their deputies, Safety and Quality managers and Department representatives. Dedicated agenda items will include O&M and construction coordination, O&M interfaces with the Department’s ongoing operations, and adjacent contractors including the existing TAMS contractor, the I-495 HOT Lanes concession and the ongoing work inside the Beltway. From these meetings, we will mobilize our O&M crews while ensuring all are aware of the balance of responsibilities.

Our maintenance of traffic (MOT) approach will include detailed procedures and timing for when roadway elements become our responsibility to operate and maintain, and when they will be transferred back to the Department, if applicable. In general, O&M activities will be transferred to the Lead Contractor when the existing facility roadway Advanced Traffic Management System (ATMS), structure, drainage, lighting or other devices are impacted.

The Department will have minimal O&M responsibilities after the O&M activities listed above are transferred to the Lead Contractor. The Department’s responsibilities will include coordination efforts for their maintenance obligations such as snow removal, intelligent transportation systems (ITS) and HOV and shoulders lanes which are not transferred to the Lead Contractor.

Mobilizing O&M Crews

The integration of the on-site O&M crews will largely occur as we implement our MOT Plan. The Lead Contractor’s O&M crews and MOT crews will work together to implement ongoing O&M activities.

- **O&M Crews:** We will have six O&M crews, one for each direction of traffic per segment. Each O&M crew will include five workers fully equipped for pavement, structures, drainage and lighting maintenance, among others.
- **MOT Crews:** We will have six MOT crews, one for each direction of traffic per segment. Each MOT crew includes six workers fully equipped with traffic management equipment.

**FIGURE 4.2.1-4 ATMS Relocation**

As construction begins, traffic will be shifted to the inside of the corridor. This shift will include relocating ATMS devices to support their continuous operation during construction. In this example, the road operation panels are shifted on the overhead structure to align with the temporary lane configuration.
4.2.2.1 ALTERNATIVE TECHNICAL CONCEPTS

The complete ATC package, including approvals and any conditions for each ATC is provided in electronic format.

<table>
<thead>
<tr>
<th>ATC No.</th>
<th>Name</th>
<th>Brief Description</th>
<th>Value</th>
<th>Proposal Reference Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>012</td>
<td>Additional Connectivity at the I-495 Interchange</td>
<td>Additional interchange ramp to connect the eastbound I-66 Express Lanes to the northbound I-495 General Purpose Lanes</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 3 Sheet 3 of 10)</td>
</tr>
<tr>
<td>028</td>
<td>Additional Connectivity at the I-495 Interchange</td>
<td>Additional interchange ramp to connect the southbound I-495 General Purpose Lanes to the westbound I-66 Express Lanes</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 3 Sheet 3 of 10)</td>
</tr>
<tr>
<td>025</td>
<td>Additional Connectivity Chain Bridge Rd. (Route 123)</td>
<td>Additional Express Lanes connections west of Chain Bridge Rd. to connect the eastbound I-66 Express Lanes to Chain Bridge Rd. and connect Chain Bridge Rd. with westbound I-66 Express Lanes</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 3 Sheet 1 of 10)</td>
</tr>
<tr>
<td>030</td>
<td>Additional Connectivity at Sudley Road (Route 234)</td>
<td>Two braided ramps provide additional connectivity east of Sudley Rd; one braided ramp from the eastbound General Purpose Lanes to eastbound Express Lanes and another braided ramp from the westbound Express Lanes to westbound General Purpose Lanes</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 1 Sheets 2 and 3 of 4)</td>
</tr>
<tr>
<td>020</td>
<td>70 mph Speed Limit in Express Lanes</td>
<td>The Express Lanes will have a posted speed of 70 mph</td>
<td>Improved connectivity and mobility</td>
<td>N/A</td>
</tr>
</tbody>
</table>

ATCs to improve connectivity, mobility and Level of Service, and increase throughput on both the Express Lanes and General Purpose Lanes

<table>
<thead>
<tr>
<th>ATC No.</th>
<th>Name</th>
<th>Brief Description</th>
<th>Value</th>
<th>Proposal Reference Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>017</td>
<td>Stringfellow Road Express Lanes Ramps</td>
<td>Full reconstruction of the crossing instead of rehabilitation and widening of the existing structures to accommodate the 42’ WMATA median and eliminate an important ROW impact to the Walmart’s fire lane.</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 3 Sheet 1 of 10)</td>
</tr>
</tbody>
</table>

ATCs to reduce ROW and mitigate risk

<table>
<thead>
<tr>
<th>ATC No.</th>
<th>Name</th>
<th>Brief Description</th>
<th>Value</th>
<th>Proposal Reference Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>003</td>
<td>Optimized Vaden Dr. Ramp access</td>
<td>Eliminate the king, straddle bent structure that spans the storage tracks of the WMATA rail by realigning the eastbound and westbound I-66 lanes farther away from the existing median to place the access ramps adjacent to the existing median concrete barrier. The new Vaden Dr. ramp configuration will be compatible with the future WMATA westbound extension</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 3 Sheets 2 and 3 of 10)</td>
</tr>
<tr>
<td>005</td>
<td>Nuldey Bridge Preservation</td>
<td>Rehabilitate the existing bridge to incorporate it as part of the proposed southbound bridge of the I-66 MTPs instead of demolishing it</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 3 Sheet 2 of 10)</td>
</tr>
<tr>
<td>016</td>
<td>Vienna Station North Pedestrian Bridge</td>
<td>Retrofit the existing north pedestrian bridge at the Vienna Metro instead of replacing it; preserve the existing retaining wall on the north side of the westbound collector-distributor lanes</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.2 Roadway Schematic Appendix – Proposer’s Schematics (Segment 3 Sheet 2 of 10)</td>
</tr>
</tbody>
</table>

ATCs to mitigate WMATA, MOT and schedule risk

<table>
<thead>
<tr>
<th>ATC No.</th>
<th>Name</th>
<th>Brief Description</th>
<th>Value</th>
<th>Proposal Reference Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>017</td>
<td>Alternative Bridge over Gallows Road</td>
<td>A new two-lane bridge ramp that travels parallel to eastbound I-66 and above the Gallows Road traction power substation (TPSS), the existing Dunn Loring pedestrian bridge (instead of replacing it), and the proposed Gallows Road</td>
<td>Improved connectivity and mobility</td>
<td>4.2.2.6 Structures Appendix – Proposer’s Schematics (Segment 3 Sheet 2 of 10)</td>
</tr>
</tbody>
</table>

ATCs to mitigate risk and improve operations and maintenance

<table>
<thead>
<tr>
<th>ATC No.</th>
<th>Name</th>
<th>Brief Description</th>
<th>Value</th>
<th>Proposal Reference Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>012</td>
<td>Developer Performs Winter Maintenance</td>
<td>Shift the responsibility to complete snow and ice removal along the Express Lanes from the Department to I-66 Express Mobility Partners</td>
<td>Improved connectivity and mobility</td>
<td>4.3.2.1 Roadway Operations</td>
</tr>
</tbody>
</table>

001 Pole Mounted Cabinets | Pole/structure mounted cabinets, compliant with VDOT 2016 Road and Bridge Specifications, will be used, wherever site conditions allow, instead of ground-mounted on concrete foundations | Improved connectivity and mobility | 4.2.2.7 Tolling and ETSM Systems |
4.2.2.2 ROADWAY SCHEMATIC

The Roadway Schematics are included in the Appendix - Proposer’s Schematics. Our design complies with all components of Phase 1 of the Preferred Alternative and achieves the following design goals as a result of the enhancements explained on the following pages and throughout our proposal:

» Improve connectivity with the Express Lanes (See 4.2.2.2 and 4.2.2.6)
» Improve the roadway’s performance (See 4.2.2.2, 4.2.2.5 and 4.2.2.6)

Minimize ROW acquisition (See 4.2.2.2 and 4.2.4)
» Positively impact the General Purpose Lanes (See 4.2.2.2 and 4.2.2.5)
» Better serve 2025 and 2040 traffic demands (See 4.2.2.2, 4.2.2.5 and 4.2.2.6)
» Maximize durability, simplify maintenance and extend the design life (See 4.2.2.5 and 4.3.2.4)

A Preliminary Traffic Analysis is included in the Appendix - Key Personnel Resumes and References.

FIGURE 4.2.2.2-1 Design Enhancements Summary
Our Design-Build and O&M teams collaborated to analyze ways to enhance a compliant design solution and accomplish the target design goals. When compared to the RFP plans, our Roadway Schematics provide the following benefits:

- **Right-of-Way Acquisition Area**
  - 4.65-acre reduction
  - 9 parcels eliminated
  - 20 parcels with reduced impacts

- **15 Enhancements That Improve Roadway Safety**
  - More than 57 utility conflicts avoided
  - 41 additional structures that accommodate the WMATA median
  - 8 solutions that minimize impacts to WMATA
  - 10% reduction in sound wall surface area

- **100% Avoidance of Permanent Impacts to Wetlands within Park-and-Rides & Detention Ponds**

- **6 Additional Express Lanes Connections**

- **26% Increased Connectivity**

- **4 of the 7 Design Exceptions & 4 of the 8 Design Waivers Eliminated From the RFP**
A. DESIGN ENHANCEMENTS

Roadway Enhancements

- WMATA Median Accommodations
- Additional Express Lanes Connections
- Wetland Mitigation at Park & Ride Facilities
- Enhanced Crisis Slopes
- Noise Wall Reduction
- Minimized Floodplain Impacts
- Right-of-way Reduction - Stringfellow Road
- Route 28 Interchange Optimizations
- Route 50 Interchange Optimizations
- Right-of-way Reduction - I-495 Interchange
- Chain Bridge Road Shared-Use Paths Optimizations

MOT Enhancements (See 4.2.2.3)

- Bull Run Drive: Two lanes of traffic are maintained instead of one, exceeding the Technical Requirements.
- Route 2B: Construction sequenced from the bottom-up where Express Lanes connectors loop under new overpasses.
- Stringfellow Road: An approved ATC eliminates construction of a braced ramp that would impact westbound traffic.
- Monument Drive: Our sequencing approach results in zero I-66 closures at this intersection.
- Route 50: The new configuration avoids construction on top of the existing footprint to avoid traffic interruptions.
- Chain Bridge Road: A temporary ramp for southbound traffic will allow demolition and reconstruction of the bridge.
- Nutley Street: An approved ATC maintains the existing bridge instead of replacing it to simplify the MOT.
- Gallows Road Bridge: Uninterrupted access is provided for Stonewood Elementary School and nearby residential areas.
- I-495 Interchange: Temporary erection towers will be used, eliminating full lane closures on the 495 Express Lanes.

Structures Enhancements (See 4.2.2.6)

- Route 2B: The ramp geometry has been optimized to eliminate design exceptions and waivers.
- Vaden Drive: An approved ATC eliminates the expensive, long slatted bent structure over the WMATA storage tracks.
- Vienna Metro Station: An approved ATC retrofits the north-pedestrian bridge and preserves the existing retaining wall.
- Nutley Street: An approved ATC maintains the existing bridge instead of replacing it to reduce costs and durations.
- Gallows Road Bridge: An approved ATC avoids the TPPS and keeps the Dunn Loring pedestrian bridge in place.

Roadway Schematic Summary

- WMATA Median Accommodation
  - The vast majority of the new structures in Segment 1 accommodate the 42-foot reserved WMATA median. Additionally, all of the additional Express Lanes connections noted below, except at Sudley Road (Route 234), are compatible with the future WMATA extension. This enhancement:
  - Exceeds the Technical Requirements, which only required the WMATA median in Segments 2 and 3
  - Reduces WMATA’s risk by resolving conflicts with the Ultimate Configuration
  - Eliminates costs and coordination required by future reconstruction

- Additional Express Lanes Connections
  - Six additional connections to the Express Lanes have been approved as ATCs by the Department. These enhancements support future 2020 and 2045 traffic demands and result in:
    - 26 percent increased connectivity throughout the corridor
    - 33 percent increased connectivity at I-495
    - 29 percent increased connectivity on limited access highways
    - 24 percent increased connectivity on other cross roads

- Site Distance
  - Site Distance improvements were provided at seven ramps along the corridor, limiting the maximum shoulder width to 12 feet in bridges as per the VDOT Manual of Road and Bridge Design.
    - I-66 EB EL to I-495 SB GPL
    - I-66 WB EL to US 50 NB
    - I-66 EB GPL to Rt. 28 NB
    - Rt. 28 SB to I-66 EB GPL
    - Rt. 28 NB to I-495 EL
    - I-66 EB EL to Rt. 28 NB
    - I-66 WB EL to Rt. 28 NB

- Wetland Mitigation
  - Our design provides 100 percent avoidance of permanent impacts to jurisdictional streams and wetlands present within all proposed Park-and-Ride and Stormwater Management Facility locations. By avoiding these impacts, this solution mitigates a significant approval risk with a solution that the U.S. Army Corps of Engineers can approve, allowing the Project to proceed.

- Noise Wall Reduction
  - Our noise specialist performed noise analyses which resulted in a more accurate location for noise walls, and reduced the sound surface requirements by 10 percent. This reduction will provide the Department a cost buffer to use for other purposes when negotiating with stakeholders.

- Minimized Floodplain Impacts
  - The Express Lanes have been redesigned with a cross slope draining towards the median instead of towards the outside. This solution improves the RFP plans which sloped all lanes toward the outside of the corridor and:
    - Prevents safety issues such as hydroplaning and the formation of ice on the pavement at the outside edge of the corridor
    - Adjusts the Express Lanes with proper pavement wedges to accommodate the revised slope. Additional pavement wedges may be needed in Segment 1 where we are milling and overlaying existing pavement. Slope adjustments will be made at the top of the subgrade in Segments 2 and 3

- Enhanced Cross Slopes
  - The Express Lanes have been redesigned with a cross slope draining towards the median instead of towards the outside. This solution improves the RFP plans which sloped all lanes toward the outside of the corridor and:
    - Prevents safety issues such as hydroplaning and the formation of ice on the pavement at the outside edge of the corridor
    - Adjusts the Express Lanes with proper pavement wedges to accommodate the revised slope. Additional pavement wedges may be needed in Segment 1 where we are milling and overlaying existing pavement. Slope adjustments will be made at the top of the subgrade in Segments 2 and 3

- Wetland Mitigation
  - Our design provides 100 percent avoidance of permanent impacts to jurisdictional streams and wetlands present within all proposed Park-and-Ride and Stormwater Management Facility locations. By avoiding these impacts, this solution mitigates a significant approval risk with a solution that the U.S. Army Corps of Engineers can approve, allowing the Project to proceed.

Enhanced Cross Slopes

- Positive Impact
  - The Express Lanes have been redesigned with a cross slope draining towards the median instead of towards the outside. This solution improves the RFP plans which sloped all lanes toward the outside of the corridor and:
    - Prevents safety issues such as hydroplaning and the formation of ice on the pavement at the outside edge of the corridor
    - Adjusts the Express Lanes with proper pavement wedges to accommodate the revised slope. Additional pavement wedges may be needed in Segment 1 where we are milling and overlaying existing pavement. Slope adjustments will be made at the top of the subgrade in Segments 2 and 3

- Noise Wall Reduction
  - Our noise specialist performed noise analyses which resulted in a more accurate location for noise walls, and reduced the sound surface requirements by 10 percent. This reduction will provide the Department a cost buffer to use for other purposes when negotiating with stakeholders.

- Minimized Floodplain Impacts
  - The Express Lanes have been redesigned with a cross slope draining towards the median instead of towards the outside. This solution improves the RFP plans which sloped all lanes toward the outside of the corridor and:
    - Prevents safety issues such as hydroplaning and the formation of ice on the pavement at the outside edge of the corridor
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  - Our design provides 100 percent avoidance of permanent impacts to jurisdictional streams and wetlands present within all proposed Park-and-Ride and Stormwater Management Facility locations. By avoiding these impacts, this solution mitigates a significant approval risk with a solution that the U.S. Army Corps of Engineers can approve, allowing the Project to proceed.
4.2.2.2 ROADWAY SCHEMATIC

**FIGURE 4.2.2-2 Roadway Schematic Summary**

1. **Right-of-Way Reduction - Stringfellow Road**
   - ATC 027 proposes reconstruction of the Stringfellow Road crossing which will accommodate the 42’ WNATA median instead of rehabilitating and widening the overpass. This ATC also eliminates an important ROW impact on the fire lane surrounding the Walmart store to construct a fire lane around the building. This ATC reduces ROW acquisition in the northeast quadrant by 3.5 acres with a minimal 0.059-acre ROW acquisition increase in the northwest quadrant. This solution will reduce the ROW acquisition timeframe by avoiding the mall parcel acquisition process.

2. **Route 28 Interchange**
   - We have optimized the ramp geometry to eliminate design exceptions and waivers, and reduce the ROW in the NW and SE quadrants.
   - Separating the Route 28 southbound collector distributor road on its own structure supports the vertical design and the exiting ramps.
   - Alignments at Braddock/Walney Road have been designed to meet 40mph criteria. A design exception is only necessary for the stopping site distance criteria (meets 35mph).
   - Route 28 northbound and southbound vertical profiles meet 60mph design speed, eliminating the design exception for crest vertical curve criteria.
   - A realignment of Route 28 northbound north of Braddock Rd. and a retaining wall adjacent to the park allowed us to maintain standard 12’ wide lanes and outside shoulders, eliminating a design exception.

3. **Route 50 Interchange**
   - Ramp from NB US 50 to WB GPLs: In the RFP plans, this ramp is connected to the southbound US 50 to westbound I-66 GPLs ramp before meeting I-66 westbound. Both ramps merge with opposite maximum superelevation and insufficient merging lengths, making the transition unfeasible. Our solution redesigned the ramp into an elliptical loop, avoiding these issues and improving connectivity.
   - Express Lanes ramp from WB I-66 to NB US 50: The RFP plan’s connection with northbound US 50 provided a very acute curve. There also was not sufficient weaving distance to exit towards the Fair Oaks Mall. Our design solves these two issues, increasing the ramp design speed to 35mph.

4. **I-495 NB GPL**
   - **Right-of-Way Reduction - I-495 Interchange**
     - In the southeast quadrant, the RFP plans include three relocations. Our optimization avoids all of these relocations and other acquisition areas. There is currently one single exit from northbound I-495 GPLs to eastbound I-66 GPLs, westbound I-66 Express Lanes and westbound I-66 GPLs. The RFP plans propose a three-level flyover. Our design revision proposes two consecutive exits: one exclusively for northbound I-495 to westbound I-66 GPLs, and a second exit connecting northbound I-495 to eastbound I-66 GPLs and westbound I-66 Express Lanes. This enhancement reduces the cross-sectional needs at the most critical section, optimizing the available space within the ROW. The Department’s proposed gore must be moved to the south, and a minor realignment of an existing secondary road will be needed without impacting additional private parcels.

5. **Shared-Use Paths**
   - A significant component of the Chain Bridge Road Interchange is the Shared-Use Paths. Our solution improves the path connectivity and resolves three conflicts to avoid at-grade Shared-Use Path crossings with interchange ramps and crossroads.
   - The design has been modified to re-direct the Shared-Use Path to the west instead of crossing over the ramp at grade.
   - The Shared-Use Path has been realigned and will cross under the ramp with a culvert instead of at-grade.
   - The Shared-Use Path has been realigned and will cross under the ramp with a covered structure instead of at-grade.
   - Where Shared-Use Paths are very tight within the ROW limits, we have strategically located retaining walls within the section, incorporating required spaces such as sound wall maintenance areas, and adjusting shoulder widths to ensure the Shared-Use Paths are designed as enjoyable paths. Where required, the shoulder is reduced to the minimum 12-foot width and the Shared-Use Path is reduced to its minimum eight-feet width with two two-foot buffers.

6. **West End Interchange**
   - The design has been modified to re-direct the Shared-Use Path to the west instead of crossing over the ramp at grade.
   - The Shared-Use Path has been realigned and will cross under the ramp with a culvert instead of at-grade.
   - The Shared-Use Path has been realigned and will cross under the ramp with a covered structure instead of at-grade.

7. **Chain Bridge (Route 123)**
   - The design has been modified to re-direct the Shared-Use Path to the west instead of crossing over the ramp at grade.
   - The Shared-Use Path has been realigned and will cross under the ramp with a culvert instead of at-grade.
   - The Shared-Use Path has been realigned and will cross under the ramp with a covered structure instead of at-grade.

8. **At-grade crossing avoided  Proposed SUP**
   - General Purpose Lanes
     - Shoulder
     - Shared-Use Path
       - 8’ wide path + two 2’ wide buffers
Our MOT Plan prioritizes the safety of the work force and the public, minimizes impacts to the community, enhances communication with the traveling public and maintains a constant flow of traffic during construction.

Our MOT Plan has been prepared in accordance with Instructional and Information Memorandum IIM-LD-241 (Work Zone Safety and Mobility) and TE 351 on Work Zone Speed Analysis. It is designed to coordinate with other Project Development Plans to ensure the most efficient delivery of the plan. It will be implemented in conjunction with the Department-administered Transportation Management Plan program.

Our approach is based on MOT methodologies, explained on the following pages and in the Conceptual Construction Staging Diagrams Schematics located in the Appendix - Proposer’s Schematics.

A. TRAFFIC MANAGEMENT, CONTROL/SEQUENCING APPROACH

The Lead Contractor plans to self-perform MOT to control this critical component of the schedule. Ferrovial Agroman self-performed MOT activities on the $2.1 (construction value) LBJ Express project, contributing to its three-month early completion. Our Traffic Manager will serve as the point of contact to address requirements for the work zone. The MOT Team will include Traffic Control Managers, Traffic Control Coordinators, Flaggers, Superintendents, CDL Drivers, Operators, Truck Drivers, Foreman, and Laborers.
MOT Methodologies

Our MOT methodologies, just like every other construction operation, will focus on the safety of the traveling public, construction personnel, Department personnel, and other individuals around the work zone. While there are inherent risks associated with building in close proximity to existing traffic, our MOT approach preserves our commitment to safety, while expediting construction and improving emergency response in the event of an incident. The safety elements of our MOT methodologies include:

- Full width travel lanes where space permits;
- 11-foot-wide travel lanes are used in tight areas;
- Shoulders where space permits;
- Barriers to separate work areas from travel lanes;
- Potential reduced work zone speed limits.

We have adopted a two-phase “Outside-to-Inside” approach as our general MOT method. This approach will be applied simultaneously in all three segments to reduce the number of traffic shifts. As shown in Figure 4.2.2.3-2, during the first phase of the Outside-to-Inside approach, our team will shift the same number of lanes that currently exist towards the inside of the corridor, allowing our team to construct the new lanes on the exterior of the corridor. The second phase involves shifting the traffic towards the exterior of the corridor to construct the Express Lanes and median. Crossings and interchanges will be phased to coordinate with the “Outside-to-Inside” approach so the traffic configuration is compatible with bent configurations and new connector ramps at interchanges.

The sequencing and traffic management approach for the bridge is simplified by ATC 027 described in 4.2.2.2, which fully reconstructs Stringfellow Road instead of rehabilitating and widening it which also eliminates construction of a braided ramp that would impact I-66 traffic.

The existing HOV ramp will be widened to become two independent entrance and exit ramps. During Phase 1 with traffic will be shifted toward the interior, the ramp will be fully operational without any revisions. During Phase 2, temporary connections to the existing HOV ramps will be provided. New ramp construction will be performed during this phase without impact to the Department’s operation of the HOV ramps.

During Phase 1, traffic will be shifted toward the interior of the corridor and no work will be done on the ramp. During Phase 2, our team will build new walls for the entrance and exit ramps in locations that accommodate the 42’ WMA median clearance (See 4.2.2.2).

Our team will construct this new bridge in three stages during Phase 1 of the Outside-to-Inside approach.

- The new bridge will be built slightly offset of the existing bridge to maintain traffic on the crossing at all times.
- Both lanes of Bull Run Drive will be kept open during all stages, exceeding the technical requirement which allows a single, 11-foot-wide reversible lane.

The sequencing and traffic management approach for the bridge is simplified by ATC 027 described in 4.2.2.2, which fully reconstructs Stringfellow Road instead of rehabilitating and widening it which also eliminates construction of a braided ramp that would impact I-66 WB traffic.

The bridge construction over Sudley Road will be developed in a single phase.
57

**TECHNICAL PROPOSAL**

**I-66 express mobility partners**

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**FIGURE 4.2.2.3 Maintenance of Traffic Methodologies**

**LEGEND**

- **CURRENT CONSTRUCTION**
- **COMPLETE CONSTRUCTION**
- **TEMPORARY PAVEMENT**

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**Gallows Road Bridge**

The Gallows Road Bridge will be constructed in three stages and maintain two lanes for each direction of traffic as well as efficient traffic flow to Stonewall Elementary School and nearby residential areas. Our MOT Plan allows for uninterrupted access for all of these stakeholders. Cedar Lane Bridge will be built with a similar sequence.

**Waples Mill Road**

This bridge will be completed while traffic is shifted to the interior because the current bent location impedes traffic when it is shifted to the exterior of the corridor. The existing two-lane bridge will be reduced to a single, 12-foot-wide lane using temporary signalization, allowing for demolition and new construction one lane at a time.

**Route 50 Interchange**

The new interchange configuration avoids construction on top of the existing footprint to streamline traffic management and avoid traffic interruptions when the new ramps cross the existing ramps. This strategy accommodates continuous access to the Fair Oaks Mall located near the northwest quadrant.

**Chain Bridge Road**

For travelers southbound on Chain Bridge Road, a temporary ramp will be built and connected to the existing ramp used for I-66 westbound traffic to southbound Chain Bridge Road. This will allow our team to demolish and rebuild the western half of the existing overpass. Once this half of the overpass is reconstructed, it will be used for northbound Chain Bridge Road traffic while the eastern half of the overpass is built.

**Nutley Street**

**APPROVED ATC**

ATC 005 was approved to maintain the existing bridge at Nutley Street instead of the requirement to replace it with a four-lane section in each direction. As a result, the existing bridge will be used for the proposed southbound Nutley Bridge as part of the Diverging Diamond Interchange (DDI). This ATC will simplify the MOT approach for this crossing because the existing bridge will be used for traffic until the new bridge for opposite bound traffic is finished. Once the two bridges are operational, it will allow for partial demolition of the existing bridge without impacting traffic.

**Jermantown Road Bridge**

The available ROW and the shifted footprint require a single phase of construction. Traffic will be maintained in its current configuration during bridge construction. Once the Jermantown Road Bridge is complete, our team will add temporary pavement as needed for minor lane shifts to connect the new bridge with the existing roadway.

**Vaden Drive**

Bridge construction will be complete before shifting traffic to the exterior of the corridor because the current bent location impedes traffic in that configuration.

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**I-695 Interchange**

See Page 58
The spans over the I-495 SB lanes are longer without any room to place bents in between ramps, General Purpose Lanes and Express Lanes. For this reason, temporary erection towers will be used. The Express Lanes will be shifted at night while the spans above them are built to maintain at least one operational I-495 Express Lane. This significant improvement will minimize revenue impacts on the third-party managing the Express Lanes and traffic impacts on motorists.

The spans over I-495 NB lanes are shorter, with bents in between Express Lanes, General Purpose Lanes and ramps, simplifying construction.

Given the length of the span connecting the I-495 SB Express Lane ramp to I-66 WB Express Lane and in an effort to eliminate impacts to traffic on I-66, the span will be built in two sub stages with a temporary tower. Traffic on I-66 WB will be kept towards the inside while the part of the span above the exterior of I-66 is built.

The remainder of the span connecting Route 28 SB to I-66 EB Express Lanes will be built to complete the work on this ramp from Phase 1A.

All other Express Lanes connectors are built to connect the newly widened Route 28 Bridge.

We will use a temporary erection tower to construct the long span over I-66 EB lanes of this connector to keep at least one lane open at all times.

We will build the portion of the connector from I-66 WB General Purpose Lanes to Route 28 NB and a span of the Route 28 SB to I-66 EB Express Lanes early in the phasing because their final configurations are underneath the new Route 28 NB bridge.

The spans over I-495 SB lanes are longer without any room to place bents in between ramps, General Purpose Lanes and Express Lanes. For this reason, temporary erection towers will be used. The Express Lanes will be shifted at night while the spans above them are built to maintain at least one operational I-495 Express Lane. This significant improvement will minimize revenue impacts on the third-party managing the Express Lanes and traffic impacts on motorists.

The spans over I-495 NB lanes are shorter, with bents in between Express Lanes, General Purpose Lanes and ramps, simplifying construction.

Given the length of the span connecting the I-495 SB Express Lane ramp to I-66 WB Express Lane and in an effort to eliminate impacts to traffic on I-66, the span will be built in two sub stages with a temporary tower. Traffic on I-66 WB will be kept towards the inside while the part of the span above the exterior of I-66 is built.

The remainder of the span connecting Route 28 SB to I-66 EB Express Lanes will be built to complete the work on this ramp from Phase 1A.

All other Express Lanes connectors are built to connect the newly widened Route 28 Bridge.

We will use a temporary erection tower to construct the long span over I-66 EB lanes of this connector to keep at least one lane open at all times.
B. CONCEPTUAL STAGING DIAGRAMS

Conceptual Construction Staging Diagrams Schematics are located in the Appendix - Proposer’s Schematics. A table that describes which existing roadways and structures will be closed, demolished, or incorporated into the Project is also shown in the schematics.

C. BUSINESS/RESIDENTIAL ACCESS

Our MOT approach maintains all access to residential areas and businesses in their current configuration throughout construction. The tight ROW restricts construction to bridges and crossroads over I-66, thereby minimizing direct access impacts to driveways or entrances to business and residential neighborhoods. For access points outside the ROW, we will inform the traveling public of revised traffic patterns.

Our MOT Plan will ensure that operations at the George C. Yeonas Park are not interrupted from March 1st through November 15th, and at the Mosby Woods Community Pool from May 20th through September 15th to ensure the public use of these facilities. Similar facilities along the corridor will be studied with the Department to determine dates where construction impacts must be eliminated.

To enhance access for businesses and residential areas, we have focused on the following key areas:

» Bull Run Drive: Both lanes of Bull Run Drive will be kept open which exceeds the technical requirement allowing a single 11-foot-wide reversible lane. By leaving both lanes open, we improve the access and safety along the Bull Run Special Event Road and Brim Lane for the visitors and employees of NOVA Parks.

» Balls Ford Road Access: We will develop this new green field segment once the ROW becomes available. We have identified construction access points at the exterior of the I-66 eastbound construction zone or through the existing Balls Ford Road. McClane Company is located where the new access road connects with the existing Balls Ford Road; their access will never be closed.

» Fair Oaks Mall: We will maintain access to the Fair Oaks Mall near the Route 50 interchange by avoiding construction within the interchange’s existing footprint to eliminate traffic interruptions when the new ramps cross existing ramps. All ramps will remain open throughout construction.

» Ellanor C. Lawrence Park: The schematics depict our phasing approach to complete the new access to the Ellanor C. Lawrence Park entirely before impacting the existing access, maintaining continuous access to the park.

D. MINIMIZING PUBLIC IMPACTS

Shown in Table 4.2.2.3-1, we focused on reducing impacts to WMATA operations. Additional strategies to reduce community, environmental and traveling public impacts are shown in Table 4.2.2.3-2.

### Table 4.2.2.3-1 Reducing WMATA Impacts

<table>
<thead>
<tr>
<th>Reducing WMATA Impacts</th>
<th>ATC 016 and ATC 017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approved ATC</td>
</tr>
<tr>
<td>ATC 016</td>
<td>ATC 016 proposes to retrofit the Vienna Station pedestrian bridge and ATC 017 proposes to keep the Dunn Loring pedestrian bridge in place instead of reconstructing both bridges. By avoiding reconstruction of both bridges, service interruption to WMATA is avoided and WMATA users will experience little to no disruption in their access to the stations.</td>
</tr>
</tbody>
</table>

| ATC 003                | This ATC will eliminate the need for the long straddle bent structure that spans the existing WMATA rail storage leading up to Vaden Drive by realigning the eastbound and westbound I-66 lanes farther away from the existing median in order to place the access ramps adjacent to the existing median concrete barrier. The coordination with WMATA will be significantly easier because no work will be completed above the rail at this location. |

<table>
<thead>
<tr>
<th>Vaden Drive Bridge Reconstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughout all phases of the Vaden Drive bridge construction, access will be maintained for the driveways to the Vienna Metro Station parking garages. This will be accomplished by starting construction of the eastern portion of the bridge first, eliminating the need for traffic entering and exiting the garages to cross the construction zone for the majority of the phasing.</td>
</tr>
</tbody>
</table>
E. LAYDOWN/STAGING AND MAINTENANCE LOCATIONS DURING CONSTRUCTION

See the Conceptual Construction and Staging Diagrams Schematics in Appendix - Proposer’s Schematics.

F. MAINTAINING AND PROTECTING ROW, ADJACENT ROADS, AND PROPERTIES

TABLE 4.2.2.3-3 Mitigation Measures to Reduce Construction Impacts

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right-of-Way</td>
<td>Temporary fencing will be installed to delineate the Right-of-Way</td>
</tr>
<tr>
<td>Adjacent Roads and Properties Damage</td>
<td>A noise assessment will be conducted prior to construction and a site-specific Noise Control Plan will be developed for predicting construction noise levels and required mitigation measures.</td>
</tr>
<tr>
<td>Noise</td>
<td>A noise assessment will be conducted prior to construction and a site-specific Noise Control Plan will be developed for predicting construction noise levels and required mitigation measures.</td>
</tr>
<tr>
<td>Vibration</td>
<td>Preconstruction condition surveys with vibration sensitive receptors</td>
</tr>
<tr>
<td>Light</td>
<td>Arrange lighting so as not to interfere with or impede traffic approaching the worksite(s) from either direction.</td>
</tr>
<tr>
<td>Dust</td>
<td>Mandate water sprinker dust control measures</td>
</tr>
<tr>
<td>Erosion/Run-off</td>
<td>Wash off mud/debris from equipment before leaving the site.</td>
</tr>
</tbody>
</table>

Our team is committed to being a good neighbor and performing work in a manner that prevents nuisance conditions. Construction Managers have the authority to stop work until nuisance conditions are resolved. We will schedule and conduct operations in a manner that reduces impacts to residential neighborhoods, hospitals, nursing homes, churches, schools, libraries, parks and recreation areas.

Our MOT approach will maintain the same number of lanes along the mainline as there are currently, use zero detours, and keep all exits open throughout construction. These strategies will contribute to a continuous traffic flow during all phases of construction.

Our MOT approach relies on short-term right-of-way lane closures to reduce impact on the traveling public. We also planned for only two major traffic shifts throughout construction—the first shift will transition traffic to the inside of the corridor for the entire length of the Project, and the second shift will transition traffic to the outside of the corridor for nearly the entire length of the Project. This will reduce the coordination required when phasing includes multiple traffic shifts every few miles.

We will implement strategies to safely guide the traveling public that have proven successful on similar projects such as using variable message signs, raised pavement markings, signage notifying drivers of unusual traffic patterns, concrete barriers to separate the construction zone from active traffic zone, 24/7 incident response teams, and courtesy patrol or dispatch services.

Continuous Traffic Flow
- Our MOT approach will maintain the same number of lanes along the mainline as there are currently, use zero detours, and keep all exits open throughout construction. These strategies will contribute to a continuous traffic flow during all phases of construction.

Minimal Traffic Shifts and Lane Closures
- Our MOT approach relies on short-term right-of-way lane closures to reduce impact on the traveling public. We also planned for only two major traffic shifts throughout construction—the first shift will transition traffic to the inside of the corridor for the entire length of the Project, and the second shift will transition traffic to the outside of the corridor for nearly the entire length of the Project. This will reduce the coordination required when phasing includes multiple traffic shifts every few miles.

Safety
- We will implement strategies to safely guide the traveling public that have proven successful on similar projects such as using variable message signs, raised pavement markings, signage notifying drivers of unusual traffic patterns, concrete barriers to separate the construction zone from active traffic zone, 24/7 incident response teams, and courtesy patrol or dispatch services.

Community
- Our MOT approach maintains all business and residential access at all times throughout construction. (See 4.2.2.3.)

Haul and Access Routes
- All haul routes will be diligently maintained with crews that will monitor them for cleanliness and needed repairs. The scheduling of major material deliveries will be established to avoid peak traffic hours. We will use I-66 as much as possible for haul routes and access to the Project to limit traffic in neighboring communities, but certain interchange work will require use of US 29 as a parallel route to I-66. Our main source of dirt, aggregates and the dumping area for unsuitable material and concrete demolition will be located at 27872 Gum Spring Rd in Chantilly, VA 20152 (Luck Stone facility).

Economic Development
- We propose to implement two programs during construction that have historically increased business sales and resulted in a positive impact on the community on other similar projects. These programs will promote local businesses affected by construction and include online marketing and loyalty discount cards. (See 4.1.6.)

Environmental
- Our trained environmental inspectors will monitor implementation of the environmental commitments using quality control checklists provided on the tablets they carry in the field.

Construction Monitoring Plan
- Our trained environmental inspectors will monitor implementation of the environmental commitments using quality control checklists provided on the tablets they carry in the field.

Erosion and Sediment Control
- Further detailed in 4.1.3 and 4.2.2.3.1, temporary and permanent E&S measures will be installed throughout the Project including all control fence, straw bale row check dams and wattles, and silt traps.

Water Runoff
- Construction activities such as demolition, saw cutting, and concrete removal will be completed to eliminate any concrete or debris from entering neighboring streams. All environmental staff will be trained in Clean Water Act Compliance permits and identification of Waters of the U.S., including wetlands, to avoid additional unexpected impacts.

Hazardous Materials
- We will prepare a Hazardous Materials Management Plan (HMMP) for the safe handling, storage, treatment and/or disposal of hazardous materials. The HMMP will avoid environmental damage and implement timely spill control and response plans.

Delineated Environmental Areas
- Prior to construction, a qualified biologist will survey and delineate environmentally restricted areas (ERA) and environmentally sensitive areas (ESA) that will be avoided throughout the construction. Our design provides 100% avoidance of permanent impacts to jurisdictional streams and wetlands present within all proposed Park-and-Ride and Stormwater Management Facility locations.

Material Management
- We will maximize diversion of construction and demolition debris from landfills by recycling aggregate and paving materials; using modular construction and off-site fabrication to minimize on-site waste; designating areas for segregated and commingled waste and recyclables collection; and using reusable materials such as formwork and re-assemble temporary erosion control measures.

Air Quality
- We will use clean equipment for all off-road and on-road construction diesel equipment that will meet EPA Tier IV requirements whenever possible; all equipment will be certified to meet EPA Tier III level. We will use clean fuels, such as propane or ultra-low sulfur diesel, and cleaner diesel control technology, including EPA-verified diesel particulate filters or diesel oxidation catalysts.

Time of Year Restriction
- Our schedule considers Time-of-Year Restrictions (TOYR). The Department has confirmed exclusion calls for Northern Long-eared bat at the Balls Ford Road Park-and-Ride. The bridge survey for the Northern Long-eared bat identified the presence of bat dropping at five bridge locations. We will refrain from tree clearing or demolition activities from April 15 to September 15 (TOYR).

Our schedule considers Time-of-Year Restrictions (TOYR). The Department has confirmed exclusion calls for Northern Long-eared bat at the Balls Ford Road Park-and-Ride. The bridge survey for the Northern Long-eared bat identified the presence of bat dropping at five bridge locations. We will refrain from tree clearing or demolition activities from April 15 to September 15 (TOYR).
4.2.2.4 DRAINAGE

I-66 Express Mobility Partners has designed an efficient surface water collection and conveyance system, vital to a highly functional roadway. Our extensive due diligence included the following:

» A detailed investigation of the pre-developed drainage facilities and the post-developed conditions was completed and resulted in the adaptation of 75 percent of the existing facilities into the new drainage design.

» We used a range of modeling software with approved analysis methodologies to ensure the appropriate tools were used to design each drainage feature.

» Our design was verified using hydraulic calculation software, as specified by the Department.

Our extensive due-diligence resulted in an overall surface water collection system that includes transversal drainage crossings, longitudinal drainage systems (inlets and closed stormwater collection) and stormwater detention systems. All drainage facilities were designed to meet or exceed the Technical Requirements including inlet spread conduit capacity, culvert hydraulics, and roadside ditches.

A. SURFACE WATER COLLECTION SYSTEM

Our drainage system includes two primary systems to collect surface water and convey it from the roadway:

1. Roadway Surface Water Collection System: This “closed” system collects and conveys surface water with inlets, trunk lines and storm water detention ponds before being discharged to a stream or a channel (See Figure 4.2.2.4-2).

2. Area Runoff Water Collection System: This system collects the area’s runoff before it impacts the corridor with a ditch to convey water to a transverse culvert linked to the Roadway Surface Water Collection System.

Details of the collection system including the location of major drainage trunk lines and outfalls are in the Drainage Schematics in the Appendix - Proposer’s Schematics.)
Inlets
Our system proposes curb, barrier, or ditch inlets to collect storm water runoff:

» Standard Drop Inlet DI-10H and 10I will be installed along the mainline where a concrete barrier is present
» Standard Drop Inlet DI-3B, 3C, DI-4B and 4C will be installed along S-lines where a curb and gutter system is present in cross streets
» Standard Drop Inlet DI-1 will be installed in lower median locations as a ditch inlet along the corridor

All inlets were designed with a 10-foot-long opening for on-grade inlets and a 16-foot-long opening for mainline sag inlets to comply with Table 9-1 of the VDOT Drainage Manual and the Stormwater Inlet Computation Sheet LD-204.

Inlets and ditches were designed to provide sufficient capacity to convey the design flow of a 10-year rainfall event. Additionally, these inlets and ditches were checked against 50-year and 100-year storms to ensure roadway flooding will not occur during low annual probability storms.

Trunk Lines
To minimize additional ROW needs due to the tight ROW constraints, a trunk line system was selected in lieu of ditches to convey the water. Trunk lines below the shoulder and the median connect to each inlet to convey the surface water parallel to the corridor as shown in the Drainage Schematics in the Appendix - Proposer’s Schematics.

Design aspects such as pipe cover, hydraulic capacity, and velocity were designed to meet VDOT Drainage Manual guidelines.

Longitudinal trunklines were designed to tie directly into crossing culverts whenever possible to minimize the impacts to MOT phasing. In locations where storm trunklines cross the existing I-66 lanes, the trunkline will be installed with a jack and bore method to minimize traffic impacts.

Transverse Drainage
Existing culverts were analyzed hydraulically and structurally on a case by case basis to determine which existing drainage elements can be used after proper rehabilitation measures. Approximately 75 percent of the culverts were determined to be viable for rehabilitation and extension, or rehabilitation and augmentation with new parallel pipe(s). The remaining will be left in place, filled with concrete and new structures will be built. Culverts were sized to meet all requirements as described in the VDOT Drainage Manual Chapter 8.

Erosion and sediment control features at the culvert outlets were designed per section 8.3.2.6 of the VDOT Drainage Manual. The two-year design flood event was used to calculate a culvert’s outlet velocity. The velocity was used to determine the ideal erosion and sediment control measure. Different measures range from jute mesh to riprap and geotextiles.
Outlet/Outfall
A total of 38 outlet locations are provided throughout the corridor (16 in Segment 1, 11 in Segment 2 and 11 in Segment 3). Their locations are based on the current locations where stormwater leaves the Project area. Every outlet was analyzed for quality and quantity control to ensure water leaves the Project in compliance with the Technical Requirements.

Area Runoff Water Collection System
A secondary longitudinal drainage system will be installed at the outside limits of ROW to collect area runoff water coming towards the Project from outside the ROW and to provide proper conveyance to traverse crossings. The system was primarily designed to be a ditch, but in locations where additional ROW is not available, stormwater runoff will be drained into the closed drainage system. The off-site stormwater runoff will be treated in the same Stormwater Management ponds as the direct runoff from I-66, improving water quality and quantity when compared to pre-developed conditions.

B. DRAWINGS FOR CONVEYING RUNOFF TO DISCHARGE POINTS
Refer to the Drainage Schematics in the Appendix - Proposer’s Schematics, which depict our approach for conveying runoff to discharge points.

C. LIMITS OF TEMP CONSTRUCTION AND DRAINAGE EASEMENTS
We conducted a thorough analysis of all existing drainage structures and determined that 75 percent of the existing culverts could be adapted and incorporated into the new drainage design. By maximizing the amount of existing culverts that can be reused, we have optimized the total number of permanent drainage easements and temporary construction easements, reduced impacts to the traffic during construction and saved time in the schedule. Refer to the Drainage Schematics which show the limits of temporary construction and drainage easements. For the existing structures that are incorporated into the new drainage design and determined to be structurally and hydraulically sufficient, rehabilitation work will be completed to ensure appropriate design life and function of the existing culverts. The rehabilitation scope varies as a result of our detailed inspection reports:

- Patch honeycomb and spalls
- Repair spall in ceiling of barrels
- Seal construction joints leakage
- Re-grade and place riprap stoned in downstream channel to allow proper stream flow
- Repair erosion behind barrels
- Realign wingwalls with barrels at the joints and stabilize them
- Remove silt islands
- Repair floor abrasion in barrels

For existing culverts that will be rehabilitated but do not meet the hydraulic and structural criteria, we will make an extension of the box or pipes to complete the widening of the roadway. This will eliminate any need to reroute an existing stream that crosses I-66 to a new location.

New culverts will be installed with the “Cut and Cover Method” or the “Jack and Bore Method” to reduce impacts on the traveling public. The decision to use the Cut and Cover Method versus the Jack and Bore Method was closely studied for each culvert:

- The Jack and Bore Method will be used in instances where the traffic cannot be relocated to temporary lanes. This method will require temporary construction easements for bore pits or stream realignment at specific locations. This method eliminates traffic impacts because no lane closures are required.
- The Cut and Cover Method will primarily be used for shallow pipes or in locations where traffic construction will not be significantly impacted, as well as at locations where there is not enough depth to support the Jack and Bore Method. At locations where the Cut and Cover Method will be used, construction activities will be carefully coordinated with the MOT Plan.
D. STORMWATER MANAGEMENT SYSTEM

Refer to the Drainage Schematics in the Appendix - Proposer’s Schematics which depict the proposed locations for detention ponds. The detention ponds will be used to control water quantity and improve water quality leaving the Project site. The widened I-66 corridor will increase the amount of impervious area within the watersheds of the outlet points. This additional impervious area increases runoff volumes downstream of the Project which can cause flooding and erosion issues.

Stormwater Management ponds are proposed throughout the corridor to detain this additional runoff and release it at rates less than pre-developed conditions. In order to avoid significant channel improvements outside of the ROW, the proposed ponds are designed to discharge the post-developed 10-year storm at a rate less than or equal to the 10-year pre-developed rate at each outlet point along the corridor.

In addition to water quantity control, the proposed Stormwater Management ponds also contribute towards water quality requirements. The volume sizing of each pond was compared with the 2xWQV value to ensure sufficient volume to reduce the pollutant load. Additionally, hydrographs were developed with HydroCAD to ensure each pond meets the 30-hour drawdown requirement.

Due to restrictions by MOT phasing and the limited ROW, 84 pounds per year of phosphorous credits will need to be used for Segment 3 water quality. Phosphorous reduction is provided by detention ponds when runoff from impervious areas are conveyed to an appropriately designed pond. Increases in impervious areas draining to ponds directly increases the amount of phosphorous reduction provided on the Project. Due to MOT phasing considerations, limited ROW, and topographical limitations, only a fraction of the proposed impervious area could be conveyed to the detention ponds. This limited the amount of phosphorous reduction that could be provided within Segment 3.

Just west of Stringfellow Road, we have located a pond between two wetlands and used walls to support the pond’s required capacity without impacting the wetlands.
4.2.2.5 PAVEMENT

A. PAVEMENT VALIDATION REPORT

Our Pavement Validation Report is located in the Appendix – Key Personnel Resumes and References.

The minimum pavement sections for the mainlanes included in the Technical Requirements are structurally capable of complying with the traffic demands on the General Purpose Lanes and the Express Lanes. As part of our drive to innovate and commitment to reducing maintenance, I-66 Express Mobility Partners performed significant due diligence during the RFP phase which included additional pavement corings on existing cracks in Segment 1. As seen in Figure 4.2.2.5-2, cracks were identified with depths in excess of 1.5 and 2 inches (the milling depth identified in the Technical Requirements, Attachment 3.7) in Segment 1. We commit to mill and overlay up to 5 inches of the existing pavement in the areas of Segment 1 where the cracks are substantially deeper than 1.5 or 2 inches, or implement alternative pre-overlay repair techniques in agreement with AASHTO 1993, to significantly reduce the risk of cracks developing on the new pavement surface. These commitments exceptionally exceed the Technical Requirements outlined above. Detailed information is provided in the Pavement Validation Report.

FIGURE 4.2.2.5-1 Significant Pavement Enhancements
Our design extends the pavement design life with two significant enhancements, among others: doubling the strength of the base layer in Segments 2 and 3, and providing an additional mill and overlay depth in Segment 1.

**DOUBLE THE STRENGTH OF THE BASE LAYER IN SEGMENT 2 & 3**

- **CBR 5 INSTEAD OF CBR 2.5**

**ADDITIONAL 3” OF MILL AND OVERLAY IN SEGMENT 1**

- **5 INCHES INSTEAD OF 2 INCHES**

**Materials that Extend the Design Life / Improve Durability**

<table>
<thead>
<tr>
<th>REQUIREMENT EXCEEDED</th>
<th>With the extensive data received from our due diligence, we are able to provide significant pavement design enhancements that extend the design life of the pavement and/or maximize durability.</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Double the Strength of the Base Layer: Our design provides a California Bearing Ratio (CBR) 5 for the subgrade throughout all segments, ramps and cross streets of the Project, exceptionally exceeding the Technical Requirements which only require a CBR 2.5 in Segments 2 and 3 (CBR 5 is required in Segment 1).</td>
<td></td>
</tr>
<tr>
<td><strong>BENEFITS</strong></td>
<td>The increased CBR reduces settlement, deterioration, and water infiltration, eliminating subgrade problems and improving pavement performance.</td>
</tr>
<tr>
<td>» Improved Lateral Support: The CBR 5 subgrade will be extended laterally 33 percent more than the two feet that is required by the Technical Requirements.</td>
<td></td>
</tr>
<tr>
<td><strong>BENEFITS</strong></td>
<td>Extending the enhanced base layer an additional 33 percent will improve the lateral support for the pavement which further extends its design life.</td>
</tr>
<tr>
<td>» Increased Fatigue Resistance and Modulus: High Modulus Asphalt uses very hard bitumen to double the modulus achieved with a conventional base mix. We propose to use this type of asphalt for the base layers without reducing the layer thickness. The application binder will use polymer alternatives plastomers to increase the modulus of the asphalt.</td>
<td></td>
</tr>
<tr>
<td><strong>BENEFITS</strong></td>
<td>The use of High Modulus Asphalt provides an asphalt mix with an increased fatigue resistance and modulus, resulting in a longer service life.</td>
</tr>
</tbody>
</table>

FIGURE 4.2.2.5-2 Additional Mill and Overlay Depth
We commit to mill and overlay up to 5” in Segment 1 to remediate the 5” crack depths found in Segment 1.
C. DUE DILIGENCE

Pavement and Ground Conditions Due Diligence

- Six additional geotechnical borings
- 14 Seismic Refraction Surveys
- 2,618 Falling Weight Deflectometer Tests
- 52 Dynamic Cone Penetration Tests
- Cement Stabilized Sample Tests
- Atterberg limits, in-situ moisture and density, gradation, proctor, and CBR tests

Our team analyzed all geotechnical reference information provided by the Department, including historic and recently completed geotechnical reports, pavement design reports, hazardous materials reports and as-built drawings. We also conducted extensive geotechnical field and laboratory studies. As a result of this due diligence, we significantly reduced geotechnical and pavement design risks:

- **Borings**: Our team completed six additional geotechnical borings in locations where historical data lacked sufficient coverage or detail
- **Laboratory Testing**: We completed a thorough laboratory campaign to determine fundamental properties of the existing subsurface materials required for roadway and structure design
- **Seismic Refraction Surveys**: 14 seismic refraction surveys were completed to detail the depths and layering, shear wave velocities, and densities of the ground conditions and to identify excavation methods, optimize structure types, and determine shrink/swell factors of excavated materials
- **Falling Weight Deflectometer (FWD) Testing**: A total of 2,618 FWD tests were collected for all lanes and pavement types in a staggered pattern to increase coverage of the existing conditions. The primary objective was to evaluate the in-place pavement layer moduli for all pavement structures, and joint Load-Transfer Efficiency (LTE) for the rigid pavements. The testing was performed along the two outer lanes in the east and west bound directions at 300-foot spacing for the flexible and composite pavement sections, and at approximately 20 slabs per mile for the existing rigid pavement section. Testing was also completed for rigid pavement at three points on each tested slab (center and two at joints)
- **Dynamic Cone Penetration (DCP) Testing**: A total of 52 pavement cores were extracted for layer analyses and confirmation of the as-built drawings and cores released by the Department. At these locations, our team performed DCP testing on the subgrade layers after the cores were extracted to determine subgrade resilient modulus values
- **Cement Stabilized Sample Testing**: We conducted a series of cement stabilized sample testing including compression strength to determine the optimal cement treatment required to obtain the necessary resilient modulus and CBR values of the stabilized subgrade material to potentially be located underneath and supporting the design structural pavement layers
- **Additional Testing**: Bulk samples were obtained at interval locations for further testing to determine fundamental properties of the near surface materials. These tests included Atterberg limits, in-situ moisture and density, gradation, proctor, and CBR

Upon award, additional field and laboratory investigations will develop a complete database of the existing subsurface conditions. Field and laboratory testing will be conducted in accordance with pertinent VDOT, AASHTO, FHWA or ASTM procedures and protocol.

**Requirement Exceeded**

To exceed the requirements, our team will construct test embankments to monitor settlement and obtain critical parameters to improve construction quality. We have provided this additional quality step on other large infrastructure projects and introduced static and dynamic load tests for drilled shafts and driven piles as additional quality assurance measures.

During the investigation stage, we will compliment standard drilling and sampling practices with continuous cone penetration testing such as pore water dissipation tests. We will implement additional measures that exceed standard practice including vertical and horizontal inclinometers, piezometers and load plates to monitor and ensure proper settlement and stability in high-plasticity soils. These will also benefit the road long after construction is complete.
4.2.2.6 STRUCTURES

Each structure was studied to identify the best design solution to exceed the Technical Requirements, maximize durability and extend the design life:

- **Extended Design Life / Durability**: Superstructure and bridge deck enhancements to extend the design life and increase durability include low permeability concrete and corrosion-resistant coatings.

- **Reduced WMATA Risk**: In lieu of reconstructing Vienna and Dunn Loring station pedestrian bridges, and relocating the Gallows Road TPSS, we will retrofit the Vienna pedestrian bridge and provide a viaduct for the auxiliary lanes at Dunn Loring to avoid impacts to the TPSS and pedestrian bridge. Additionally, the multi-straddle structure over the WMATA tracks at the Vienna Station is avoided, providing an Express Lanes connection at Vaden Drive compatible with the 42’ WMATA median.

- **Reduced Design Exceptions**: Route 28 Interchange ramps have been redesigned to comply with clearance requirements, super elevation transitions, horizontal and vertical requirements and distances to make the Department’s selected alternative work and reduce impact to the Ellanor C. Lawrence Park. In addition, pergola-type bridges have been designed for braided ramps to avoid post-tensioned straddle bents or fracture critical elements such as steel straddle bents.

- **Reduced ROW**: Structures at the southeast quadrant of the 495 Interchange have been optimized to avoid three residential relocations and to substantially reduce the impact to other neighboring properties. In addition, retaining wall designs throughout the corridor have eliminated typical impacts on ROW acquisition because none require wall anchors and our approach in Segment 1 reduces impacts to the Cub Run Creek floodplain.

## Bridge Superstructure

### Structure Optimizations

**Enhancements**

- **Corrosion Protection**
  - All weathering steel beams will be painted with a similar color as the weathering steel to extend and improve protection from water and chloride agents.
  - The drainage system will be designed to avoid any water contact with the beams.
  - Bent and abutment caps will be designed with a downslope diverting potential water infiltrations and avoiding ponding on caps.
  - Bituminous paint will provide an additional sealant to protect against corrosion at the concrete beam ends in locations where there is no beam continuity.

- **Low Permeability**
  - Low permeability concrete mixes and additives will be used to reduce the W/C ratio and improve the concrete workability.

- **Limited Stress**
  - The stress in the deck reinforcing has been limited to control cracking and provide a more conservative deck design. Per AASHTO 5.7.3.4, stress will be limited to <0.6*Fy.

- **Higher Strength Concrete**
  - 5ksi concrete will be used for decks instead of 4ksi as the minimum prescribed in the Technical Requirements.

Superstructure types were selected either to match an existing bridge’s superstructure when widening or to maximize constructability for new structures. As shown in Figure 4.2.2.6-2, one of two primary superstructure types were considered:

- **Steel Girder Bridges**: Selected for longer spans and curved alignments at complex interchanges.
- **Precast Concrete Bridges**: Selected for shorter spans and straight span arrangements.

**A. PROPOSER’S SCHEMATIC**

Refer to the Roadway, Drainage Schematics and Bridges Schematics in the Appendix - Proposer’s Schematics which depict locations, types, foundations, controlling vertical clearances and span arrangements.
Our design follows the Department’s joint-less philosophy. Bridge joints are eliminated as the design permits. Where an expansion joint is required because of the overall expansion length, a Virginia Alternate Cap is proposed to avoid problems caused by leaking expansion joints and salt-laden water. Additionally, joint-less technology such as “link-slabs” are proposed to eliminate interior expansion joints at bridges and crossings over I-66 and the WMATA tracks.

**Abutments, Piers and Caps**

Our Design-Build Team selected the abutment type for each bridge based on the existing bridge’s abutment if the scope is bridge widening, and based on geometry, span, skew, and expansion movements for a new bridge, according to Chapter 17 Abutments (May 2016) / Part 2 / VDOT Manual of the Structure and Bridge Division. The abutment types selected include:

- **Full/Semi Integral Abutment**: Preferred option if the structure is within the limits of length, skew and thermal movement because it eliminates expansion joints, backwalls and bearing assemblies, reducing maintenance costs.

- **Conventional Abutment with Deck Slab Extension**: Second preferred alternative because it eliminates the expansion joint typically located over the abutment seat, improves the conventional abutment which reduces the impact water has on the superstructure, and it can be applied in a wider range of cases than the full and semi integral abutments.

**FIGURE 4.2.2.6-2 Structure Types**

Where possible by span arrangement and length, precast prestressed concrete girders are proposed which minimize long-term maintenance of the superstructure longitudinal members.

**FIGURE 4.2.2.6-4 Abutment Types**

We focused on using the Full/Semi integral abutment in as many locations because it reduces maintenance costs as a result of zero expansion joint, backwalls and bearing assemblies.

**FIGURE 4.2.2.6-3 Braided Ramps**

Pergola bridges are designed for the braided ramps that connect the General Purpose Lanes and the Express Lanes. This solution allows direct access to the Express Lanes from local roads without merging through General Purpose Lanes. It also requires less superstructure depth and avoids the use of steel straddle bents which are considered fracture critical elements.
Virginia Alternate Abutment: Final alternative within the Department’s joint-less philosophy for long or very skewed structures. It includes an expansion joint at the top and a design that incorporates a drainage “trough” to collect water that leaks from the joint.

MSE walls have been designed as front walls for the abutments to reduce the structure’s overall length. In these instances, the abutments’ foundation include H-piles to avoid the conflict between the deep foundations and the MSE wall straps.

Piers will be built of concrete, primarily in a circular or rectangular shape, complying with the Technical Requirements and the Aesthetic Treatment of Bridges. The following pier types have been considered and are incorporated in our design:

- Multicolumn piers with rectangular columns
- Hammerhead piers with rectangular columns for locations next to existing or future roadways
- Wall piers for locations adjacent to the WMATA median to achieve heavy construction crash protection, per AREMA standards

Conventionally reinforced concrete (not post-tensioned) straddle bents are designed for specific roadway crossings, especially in the interchanges. When required by the overall length, skew and curvature of a structure, Virginia Alternate Pier Caps similar to the Virginia Alternate Abutments will be used. To avoid ponding on bent and abutment caps, the appropriate slope will be designed for the cap to divert potential water infiltrations.

**Drilled Shafts:** Per geotechnical and constructability studies, this foundation type has been used for piers adjacent to the WMATA corridor or at water crossings because no footing is required.

**Retaining and Sound Walls**

The Project totals 44,400 linear feet of cut walls to accommodate the new alignment. Further complicating this effort is the height of the cut walls, which reach as tall as 40 feet on the eastern section of the Route 28 Interchange. All retaining walls have been designed to eliminate wall anchors that would necessitate additional ROW.

We analyzed the feasibility of using MSE walls because MSE walls are the most cost effective and contribute to schedule savings. However, the location of cut walls close to the ROW limits does not allow enough room for the MSE wall and the space required behind it to place the reinforced embankment without requesting additional ROW. We then considered constructing cut walls with soldier piles and lagging. This requires installing H-piles into the ground approximately every five to eight feet and then installing an aesthetically pleasing concrete facing on the lagging in between the H-piles.

In instances where the ROW limits would require anchors to be drilled in the earth behind the wall, the walls will be built with drilled shafts with a 36” - 60” diameter and 1’ spacing in between shafts. The shafts will vary in depth depending on the height of the wall and the depth of the rock. An aesthetic treatment will also be provided for the facing adjacent to the traveling public.

Fill walls will be built as MSE walls because they are practical and cost effective. MSE fill walls are also used at many of the bridge structures to support the abutments to minimize structure lengths. Fill walls will be strategically located at the edge of the pavement widening along the westbound lanes of Segment 1 where Cub Run Creek flows parallel to I-66 to minimize impacts to the floodplain.
Noise walls will be made of galvanized H-piles and precast panels to match the Department’s preference for noise walls within the region. Noise wall sizes have been determined based on the Noise Wall Report from the Environmental Assessment which has resulted in noise walls averaging 22 feet. The noise walls will be fixed to the concrete piles when drilled shafts are used and fixed to the H-piles when soldier piles are used. A 10-foot area behind the noise wall is provided for maintenance purposes. In areas where the ROW is extremely tight, the maintenance areas will be reduced no more than 1 foot.

### TABLE 4.2.6.2 Additional Bridge Design Enhancements

<table>
<thead>
<tr>
<th>Bridge Rehabilitation</th>
<th>Requirement Exceeded</th>
<th>To improve the durability of bridges that are being widened or kept as is, we commit to rehabilitating these structures to achieve a condition rating of 7, exceeding the requirements.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-495 Interchange</td>
<td></td>
<td>There are three structures in the I-495 Interchange that will be widened “in-kind” with the same superstructure and substructure type as the existing bridge to fit the roadway’s geometric requirements. This will allow the stiffness and fixity conditions to remain unchanged from their original condition. Additionally, the existing MSE walls will be extended, increasing the width of the bridge abutments and superstructure.</td>
</tr>
<tr>
<td>Nutley Street</td>
<td>APPROVED ATC</td>
<td>ATC 005 incorporates the existing bridge as part of the proposed southbound bridge of the DDI. We recently performed a visual inspection and confirmed the bridge’s conditions are in Fair (7) condition as depicted in VDOT’s Inspection Report (dated 2/14/2012). Our design solution will require design changes in the northwest and southwest quadrants to provide the superelevation lengths required to transition from +8 percent along the ramps to the -4 percent superelevation on the bridge. We also will remove the expansion joints to reduce long-term maintenance requirements.</td>
</tr>
</tbody>
</table>
| Route 28 Interchange | » Separating the Route 28 southbound SB collector distributor road on its own structure aided in its vertical design and the exiting ramps  
» Alignments at Braddock/Walney Road have been designed to meet 40mph criteria. A design exception is only necessary for the stopping site distance criteria (meets 35mph)  
» Route 28 northbound and southbound vertical profiles have been designed to meet 60mph design speed, eliminating the design exception for crest vertical curve criteria.  
» A minor realignment of Route 28 NB north of Braddock Rd. and a retaining wall adjacent to the park allowed us to maintain standard 12’-wide lane and outside shoulders, eliminating a design exception |
| WMATA Pedestrian Bridges | APPROVED ATC | ATC 016 was approved to retain and retrofit the existing north pedestrian bridge at the Vienna Metro station and to preserve the existing retaining wall on the north side of the westbound collector-distributor lanes. This ATC will minimize traffic impacts by significantly simplifying the construction and reduces impacts to Metro users. Retrofitting the structure will allow the new pier to be located closer to the median to provide the width needed to construct the proposed roadway. |
| Gallows Road Bridge | APPROVED ATC | ATC 017 was approved to avoid the relocation of the existing Gallows Road Train Power Substation (TPSS) as well as keep the existing Dunn Loring pedestrian bridge in place which avoids potential time delays and costly relocations. The ATC involves a two-lane bridge ramp that travels parallel to eastbound I-66 while traversing above the existing Gallows TPSS, over the existing Dunn Loring Pedestrian Bridge, and over Gallows Road. |
| Vaden Drive | APPROVED ATC | ATC 003 eliminates the expensive, long straddle bent structure over the storage tracks of the WMATA rail. This will be achieved by realigning the eastbound and westbound I-66 lanes farther away from the existing median to place the Express Lanes access ramps adjacent to the existing median concrete barrier. Our solution removes the existing bridges over Ramp A and includes a culvert for the Shared-Use Path, allowing for easier maintenance. Our solution will be compatible with future WMATA expansion to the west. |
| Stringfellow Road | APPROVED ATC | ATC 027 provides two new bridges for the crossing at Stringfellow Road which include an Express Lanes connection and accommodation of the 42’ WMATA median. In addition, this ATC eliminates ROW impacts to the shopping center on the north of I-66 by locating the ramp connections next to the median, while still accommodating the 42’ median dimension. |
B. BENT PLACEMENTS AND AESTHETIC REQUIREMENTS

Our team has completed detailed designs to minimize impacts to the WMATA tracks that will be in service during construction. We also have accommodated the future WMATA corridor expansion at new structures throughout the Project by reserving the 42’-wide median.

As shown in Figure 4.2.2.6-5, new bents near the existing tracks are located on both sides of the tracks to minimize the exterior overpass bridge spans, enabling a short center span with a different girder size to achieve the vertical clearance requirements above the rail corridor. The proposed vertical clearance meets WMATA requirements and the Technical Requirements. Our solution enhances constructability because bent access is easier when compared to constructing a central pier between the tracks. The bent locations also achieve the horizontal clearance requirements from the “WMATA Manual of Design Criteria for Maintaining and Continued Operation of Facilities and Systems”, Section 11.

Drilled-shaft foundations are proposed for the bridge foundations at these location because drilling shafts has less of an impact on active rail than driven piles, and their foundation includes a small pile instead of a footing which would require shoring and excavation. The construction of the drilled shafts will be completed during night shifts, when the Metro is not operational.

The bents are designed as wall piers to meet the requirements for a pier of heavy construction crash protection, according to the “American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering”. Generally, wall piers are 3’ in diameter, except at the Gallows Road overpass where the columns are placed outside the station walls, and therefore, this requirement is not necessary. For the new Gallows Road overpass, the intent is to maintain the existing foundations (strengthening them if necessary), because there is minimal space available and there are significant risks associated with removing the existing piles and cap in such close proximity to the Metro station.
4.2.2.7 TOLLING AND ETTM SYSTEMS

I-66 Express Mobility Partners designed and will implement the Project's tolling and Electronic Toll and Traffic Management (ETTM) system with a focus on one primary goal—to develop the most technologically advanced corridor in the world.

To achieve this goal, our approach includes ETTM design-build solutions explained throughout our proposal that support the following objectives:

» Provide users with the highest quality customer service and user experience
» Deliver flexible infrastructure that can adapt to future technology enhancements
» Improve mobility throughout the concession term and beyond the Project's limits

Our team's highly relevant past experience, measurable commitments and in-house tolling expertise will contribute to making the Project to most technologically advanced roadway in the world.

Relevant Past Experience

Cintra operates 362 Open Road Tolling points across 10 facilities incorporating multiple tolling system integrators. (Figure 4.2.2.7-1)

In-House Expertise

I-66 Express Mobility Partners will not subcontract the integration of tolling and ETTM to a third-party. Our management has the in-house expertise to execute our plan during the Design-Build phase and the ability to manage it during the Operating Period.

Measurable Commitments

I-66 Express Mobility Partners commit to implement the infrastructure needed to develop an advanced and connected corridor. This commitment enables the Project to benefit from enhancements, such as the use of autonomous and connected vehicles, as well as future long-term benefits yet to be seen with autonomous vehicles. The Department is a key player in the research and development of autonomous and connected vehicles with their work on the Connected Pooled Fund Study and the Virginia Tech Transportation Institute's Smart Road project. We will build on the Department's work by providing infrastructure capable to make connected vehicles a near-term feature of the Project.

The Project will be the first “Connected Vehicle Ready” corridor and the most advanced Vehicle to Infrastructure (V2I) corridor in the world with Dedicated Short Range Communication (DRSC) technology implemented into the core of the Project. Connected vehicles will serve as a key step towards autonomous vehicles. While mass implementation of autonomous vehicles is in the distant future, V2I technology has an immediate impact and long-term benefits for road safety and mobility. Once the V2I infrastructure is activated, it can be used by the Department and motorists throughout the region because data can be shared with other state agencies and augment the Department’s existing connected vehicle transportation databases.

FIGURE 4.2.2.7-1 Relevant Past Experience

Cintra operates 362 Open Road Tolling points across 10 facilities incorporating multiple tolling system integrators.