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## 2. Project Characteristics (Conceptual Development)

### 2.1. Project Definition

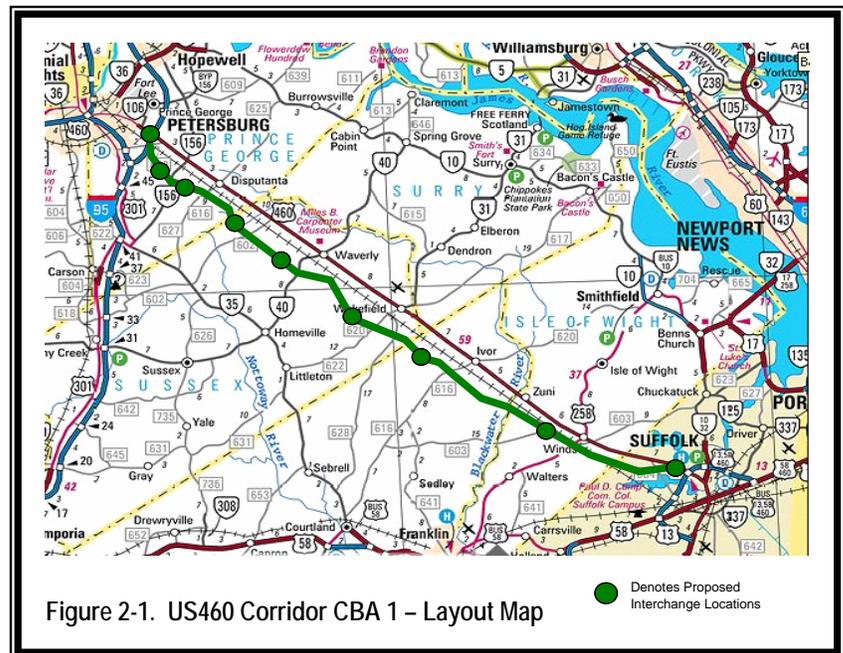
Provide a description of the transportation facility or facilities, including the conceptual design and all proposed interconnections with other transportation facilities. Describe the project in sufficient detail so the type and intent of the project, the location, and the communities which are located within the project limits are clearly identified. Describe the assumptions used in developing the project. The project description should be prepared in a way that fully recognizes any federal and/or Commonwealth requirements to analyze other project alignments and alternatives, if applicable. Provide a general description of all tasks involved in the project.

#### 2.1.1. Introduction

The Virginia Department of Transportation (VDOT) proposes to construct a roadway alignment for United States (US) Route 460 located in Candidate Build Alternative 1 (CBA 1). This proposed alignment was outlined in the Route 460 Corridor Study provided by VDOT. The roadway alignment is approximately 55 miles/89 kilometers in length and runs in a generally east-west direction between Interstate 295 (I-295) in Prince George County, VA, just east of the City of Petersburg, and US Route 58 in Suffolk, VA. The proposed US Route 460 Corridor Improvements would be constructed as a four-lane, divided facility with interchanges at major crossroads and both ends of the project.

The purpose of the proposed roadway alignment is to improve roadway safety and accommodate increasing freight traffic in addition to reducing travel delays. The roadway alignment will also provide an alternate hurricane evacuation route and a strategic military connector for the Hampton Roads area.

The origins of the Route 460 Corridor Study started with the Virginia General Assembly passing House Joint Resolution 684. This resolution established the 460 Communications Committee and tasked them with receiving feedback from the localities on how best to improve the Route 460 corridor. The feedback from the Communications Committee established the basis for the Route 460 Corridor Study. VDOT initiated the corridor study to evaluate, determine, and recommend a viable solution to the Route 460 transportation concerns. The Corridor Study focused on addressing the roadway deficiencies, improving safety, accommodating



increasing truck traffic, reducing delays, providing an alternate evacuation route, improving the military connectivity, and meeting local economic development plans. The Corridor Study team evaluated five alternatives and documented their findings in the Draft Environmental Impact Statement. The Corridor Study team recommended using CBA 1 as the preferred corridor and the Commonwealth Transportation Board selected a modified CBA 1 as the preferred alignment. Figure 2-1 shows the location of CBA 1.

To address the transportation needs of the area, VDOT is currently seeking private investment to develop and operate the Route 460 Corridor Improvements through the Solicitation for Proposals pursuant to the Public-Private Transportation Act of 1995.

### 2.1.2. Nature of Proposal

Cintra presents this Proposal as a response to the US Route 460 Corridor Improvement Project Solicitation for Proposals issued by VDOT. The Proposer intends, through this Conceptual Proposal, to provide sustainable evidence of the benefits that VDOT, the Commonwealth of Virginia, and its taxpayers and motorists can draw from a Public/Private Partnership with a Cintra-lead Consortium to operate and maintain the US Route 460 Project, during a Concession Term to be determined, and to collect and retain corresponding toll revenues. The Proposal considers the following Key Tasks:

1. **ROW acquisition** of necessary land to develop the US Route 460 Corridor
2. **Design and construction of the US Route 460 Project** to address the current transportation needs of the corridor including a complete Intelligent Transportation System
3. **Design and implementation of toll collection systems** interoperable with existing systems currently used by VDOT
4. **Operation and maintenance of the Project facility** during the duration of the concession term taking advantage of Cintra's proven expertise and state of the art know-how in Operations and Maintenance
5. **Financing** of the Capital Improvements related to the Project as well as operation and maintenance responsibilities

### 2.1.3. Transportation Facility

The Proposer reviewed the Route 460 Corridor Study and will use CBA 1 as the framework to devise a feasible and highly functional design for the proposed tollroad along the US Route 460 preferred alignment.

The Project alignment features a four-lane, divided roadway, using design standards for a Rural Principal Arterial (VDOT GS-1 criteria). For level terrain this would require a minimum design speed of 70 miles per hour (MPH) or 110 kilometers per hour (KPH), and maximum mainline curvature of 3 degrees. The map layout of the Project is added as part of Additional Materials.

Environmental studies have been conducted by VDOT along Corridor CBA 1 within a 500-foot bandwidth, with additional widths in interchange areas. The Consortium's design for the Project alignment will provide functionality and accommodate the environmental studies' findings.

Corridor CBA 1 currently includes seven diamond interchanges in addition to the two major connections at I-295 (west end) and Route 58 (east end). Based on CBA 1, the Project will directly impact the City of Suffolk and the following counties: Prince George, Sussex, Southampton, and Isle of Wight. The following towns are also

impacted along the existing Route 460 corridor: Disputanta, Waverly, Wakefield, Ivor, and Windsor. The total nine interchange locations along the Project alignment with the general type of interchange configuration anticipated to be required, as well as existing traffic counts in vehicles per day (VPD) on the crossing roads, are listed from west to east in Table 2-1.

Location	Interchange Type	Traffic Volumes (in VPD)
I-295/US 460 (New Bohemia)	Directional/Flyovers	20,000
VA 156	Diamond	4,700
State 625 (Disputanta)	Diamond	1,200
State 602	Diamond	1,300
VA 40 (Waverley)	Diamond	2,100
State 620 (Wakefield)	Diamond	330
State 616 (Ivor)	Diamond	1,200
US 258 (Windsor)	Diamond	5,300
US 58 Bypass (Suffolk)	Directional/Flyovers	32,000

Table 2-1. Anticipated Project Connecting Facilities

#### 2.1.4. Proposal Approach

The Proposal approach is directed towards maximizing the value to be drawn from the Project and the benefits to be perceived by VDOT, the Commonwealth of Virginia, and its taxpayers and motorists. Cintra's approach is to propose a BASE CASE and two additional alternatives, the BASE OPTIMIZED and the ENHANCED CASES. The three different scenarios intend to:

1. Expediently solve transportation needs of the area
2. Comply with environmental procedures and approvals
3. Satisfy and, when permissible, exceed technical requirements
4. Eliminate or reduce the need for public funding

The proposed cases are described as follows:

#### **BASE CASE**

The BASE CASE proposes as part of its Capital Improvements construction of the entire facility as defined by CBA 1 with minor design modifications. These modifications arise from a review of the Concept Interchanges provided by VDOT and consist of improvements to the safety and functionality of the major interchanges with I-295 and US 58. This CASE also includes the construction of all seven diamond interchanges as defined by CBA 1 before commencement of the concession term (see Project Connectivity as part of Additional Materials).

The proposed facility will remain within the area being cleared during the current environmental process. Details of the proposed interchanges are presented in Section 2.1.6.

The BASE CASE proposes the implementation of a mixed toll system allowing both manual and electronic toll collection. In addition, a complete Intelligent Transportation System is also proposed.

The BASE CASE is to be completed during a 3-year construction schedule after a Concession Agreement is produced and ROW is acquired. Additional information regarding Project Schedule is added as part of TAB 3 Section 3.1.4.

### **BASE OPTIMIZED CASE**

The BASE OPTIMIZED CASE proposes as part of its Capital Improvements construction of the entire facility as defined by CBA 1 with minor design modifications (same as in BASE CASE). However, at several of the very low volume crossroads (e.g., State 625, 602, 620, and 616) consideration could be given to delaying or deferring completion of the interchanges until justified by traffic growth. Therefore, the BASE OPTIMIZED CASE includes three diamond interchanges, VA 156, VA 40 and US258, in addition to the two major connections at I-295 and Route 58 (see Project Connectivity as part of Additional Materials). The remaining intersections shall be considered as part of future phased construction dependant on traffic characteristics.

The BASE OPTIMIZED CASE also proposes the implementation of a mixed toll system allowing both manual and electronic toll collection. In addition, a complete Intelligent Transportation System is also proposed. Systems implementation corresponding to diamond interchanges to be constructed at a future date will also be phased.

The BASE OPTIMIZED CASE is to be completed during a 3-year construction schedule after a Concession Agreement is produced and ROW is acquired. Additional information regarding Project Schedule is added as part of TAB 3 Section 3.1.4.

### **ENHANCED CASE**

The Proposer considers the ENHANCED CASE as a premium alternative to the Commonwealth of Virginia and its motorists from both the Technical and Financial perspectives. The ENHANCED CASE proposes to improve both the US Route 460 and I-64 Corridors.

Due to the relevance of this alternative, the Proposal addresses the technical aspects in a separate Section, 2.13. Financial details can be found as part of TAB 3.

#### **2.1.5. ROW Acquisition**

Based on the VDOT Technical Report, there will be 409 parcels impacted by the CBA 1 alignment. Of these 409 parcels, 53 residences and 1 minority, nonprofit business will be required to relocate. Eighty-five percent of the residential properties are owner occupied and 15% are tenant occupied. It has been estimated that 130 family members will be displaced consisting of 14% elderly, 38% minority and 10% low-income.

Cintra proposes to acquire all parcels under The Uniform Relocation and Real Property Acquisition Policies Act using the latest VDOT Right of Way Manual of Instructions per the 1950 Code of Virginia Titles 25 & 33.1 as a guideline.

### 2.1.6. Conceptual Design

The following sections provide a preliminary review of VDOT's framework alignment and design as presented by Route 460 CBA 1 and corresponding Concept Interchanges and an overview and description of proposed modifications and improvements. These improvements maintain the connectivity intended by CBA 1 documents.

#### CBA 1 - CONCEPT INTERCHANGES

The I-295 and Rte. 58 concept interchanges, provided by VDOT, and part of the proposed CBA 1 alignment, impose certain challenges regarding their design and constructability. This section reviews those items the Proposer considers in need of revision. Further sections describe the improvement details to address them.

- **I-295/460 Interchange**

The I-295 Concept Interchange, Figure 2-2, connects the 460 Toll Road directly to I-295 with access provided to Existing US 460 and State Route (SR) 630 using two closely spaced diamond interchanges and a major relocation of SR 630. Based on this concept drawing, one of the design challenges is whether the concept interchanges can be built to meet design standards due to constraints posed by closely parallel corridors of the Norfolk Southern Railway and US 460.

A partial diamond interchange is shown at Existing US 460 that depicts short ramps providing access to and from Existing 460. The ramp from Existing 460 to the eastbound 460 Toll Road will be difficult to achieve in the relatively short distance of 500-600 feet between 460 and the Norfolk Southern Railway track, especially with the additional vertical clearances required for railroad overpasses. Missing is the movement that would serve traffic from westbound 460 Toll Road to eastbound Existing 460. The concept drawing states that this movement would be made via existing SR 630 and Route 156 to Existing 460 east. Major portions of SR 630 feature a 16-foot pavement width, with a posted speed limit of 30 MPH on which trucks are prohibited. Clearly this is not a suitable route for traffic destined for eastbound Existing 460 unless major improvements are proposed.

A second closely spaced diamond interchange is shown at Relocated SR 630, with short ramps connecting the 460 Toll Road just short of the Norfolk Southern Railway proposed

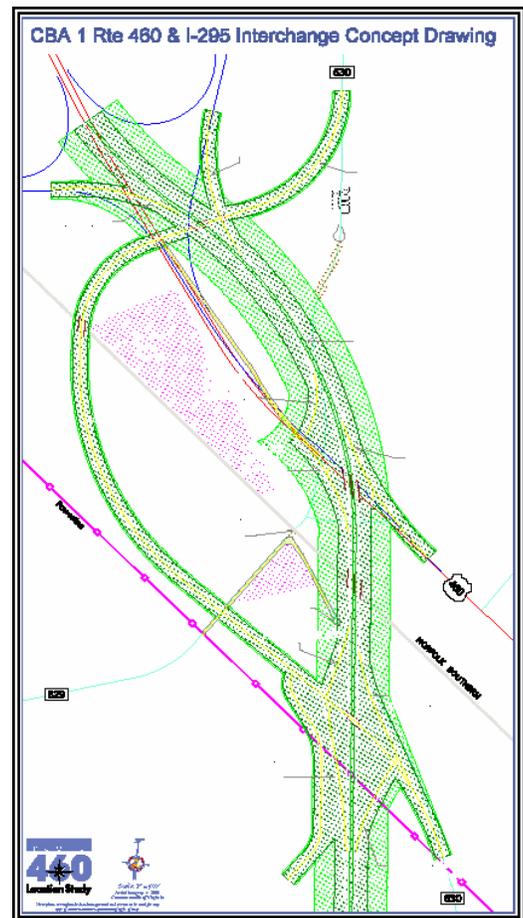


Figure 2-2. CBA 1 Concept Interchange – I-295

overpass. This interchange would provide access to the SR 630 and SR 629 corridors and the Norfolk Southern Intermodal Facility currently under development. As previously noted, it will be difficult to provide ramp gradients to meet design standards within the distances depicted. Another potential problem with the two closely spaced interchanges is the resulting short weaving distance of approximately 400-500 feet on eastbound 460 Toll Road.

In addition, SR 630 is shown to pass under proposed US 460 in the vicinity of the gore points of the I-295/US 460 interchange, but passing over the Norfolk Southern Railway. A connection of Relocated SR 630 to Existing 460 is also shown, which effectively provides a dead end for Existing 460. It is questionable whether gradients meeting established design criteria can be provided under these constrained conditions, either on Relocated SR 630 or US 460.

- **US 58/460 Interchange**

The Rte. 58 Concept Interchange, Figure 2-3, connects the 460 Toll Road directly to the US 58 Bypass in Suffolk, and is integrated into the Existing 460/58 interchange, located just to the north. The VDOT concept drawing depicts the proposed interchange as a trumpet configuration that creates an undesirable short weaving area between the 460 Toll Road on ramp and the Existing 460 off-ramp. Another undesirable feature is that traffic exiting northbound US 58 destined for the westbound 460 Toll Road will be subjected to a low-speed reverse curve maneuver that is conducive to trucks tipping over. The concept drawing also depicts a ramp from eastbound 460 Toll Road to southbound US 58 that appears to be too short for a proper tie-in, as well as an overpass ramp from southbound US 58 that appears to be too short for a proper tie-in, as well as an overpass ramp from southbound US 58 to westbound 460 Toll Road that may be impractical from a grade standpoint.

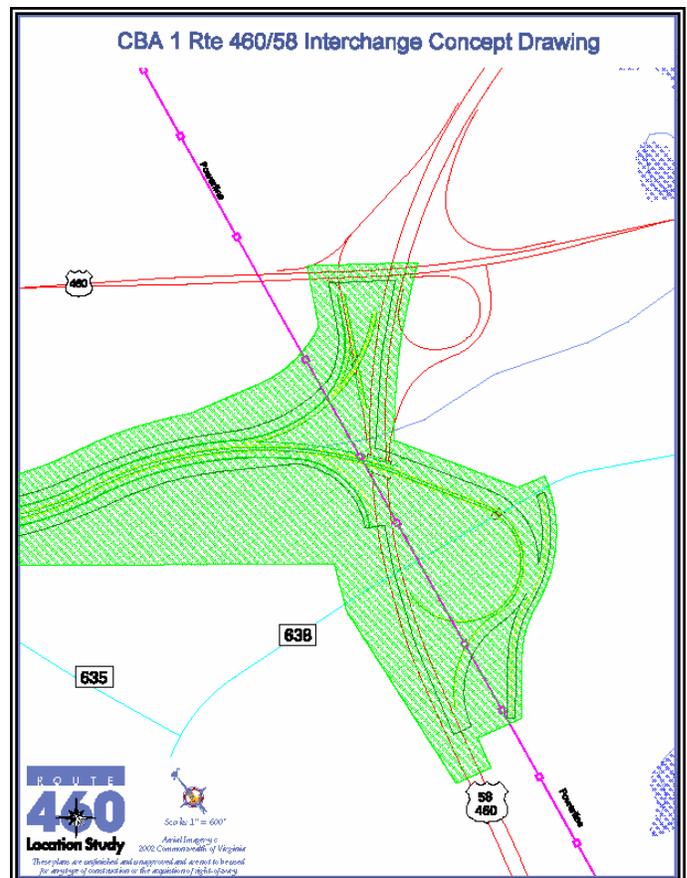


Figure 2-3. CBA 1 Concept Interchange – Rte. 58

**PROPOSED IMPROVEMENTS DETAILS**

*BASE CASES*

The Proposer has identified the following modifications and improvements as part of the BASE and BASE OPTIMIZED CASES.

- **I-295/460 Interchange**

To improve safety and traffic operations on the 460 Toll Road certain modifications are recommended that would generally stay within the approved corridor (see Figure 2-4). These include carrying SR 630 over both US 460 and the Norfolk Southern Railway. If possible, a connection will be made with Existing 460, but grade differentials may prevent this. In any case Existing 460 will remain open to a point to provide access to the Sacred Heart Church.

Connections between Existing 460 and 460 Toll Road to and from the west will be provided by use of slip ramps. Traffic volumes between Existing 460 and 460 Toll Road to and from the east would likely be minor, so no connections would be included initially. These connections can be added by including loop ramps in the northeast and northwest quadrants of the Existing 460/460 Toll Road interchange. This would expand construction outside of the approved corridor.

A diamond interchange at Relocated SR 630 is not shown initially. Access to Existing 460/460 Toll Road can be made by traveling over Relocated SR 630 to Bull Hill Road (SR 630), then via a New Connector Road between Bull Hill Road and West Quaker Road, which connects to Existing US 460.

The New Connector Road was proposed as a part of the New Bohemia Business Park development. Should a more direct connection be desired to serve the SR 630/629 corridors and the Norfolk Southern Intermodal facility, a half-cloverleaf interchange with full movements could be provide at the SR 630 overpass. This, of course, would expand construction outside the approved corridor.

- **US 58/460 Interchange**

This concept, Figure 2-5, basically expands the CBA 1 so that the gradients would function, but would still stay within the approved corridor limits or existing right of way. In this case the potential weaving problem area

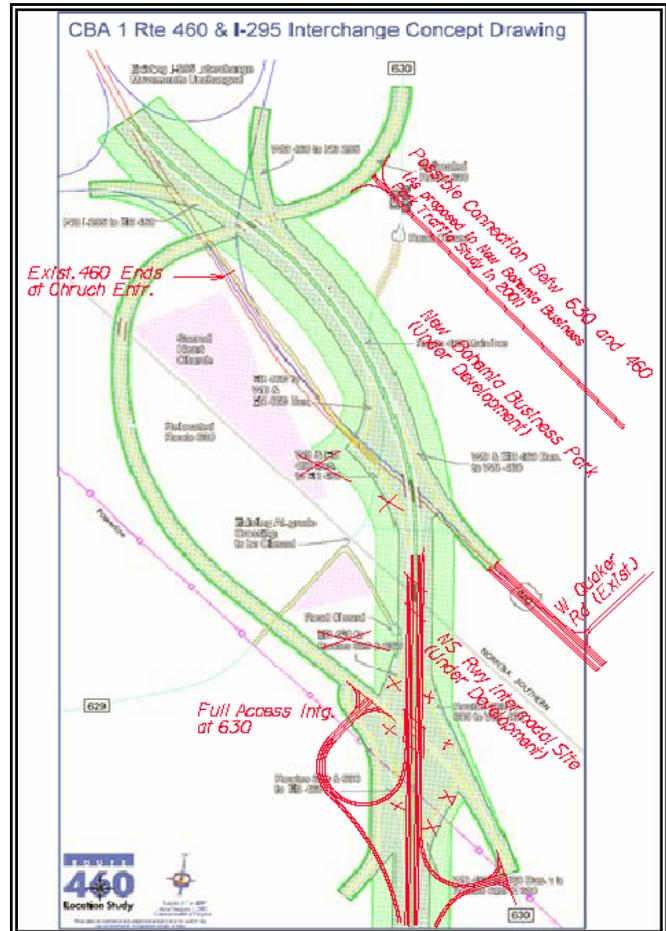


Figure 2-4. BASE Modifications – I-295 Interchange

would remain, as would the reverse curve area. The ramps from Existing 460 to US58 and westbound 460 Toll Road would be adjusted to provide sufficient length for the ramp grades to meet established design criteria.

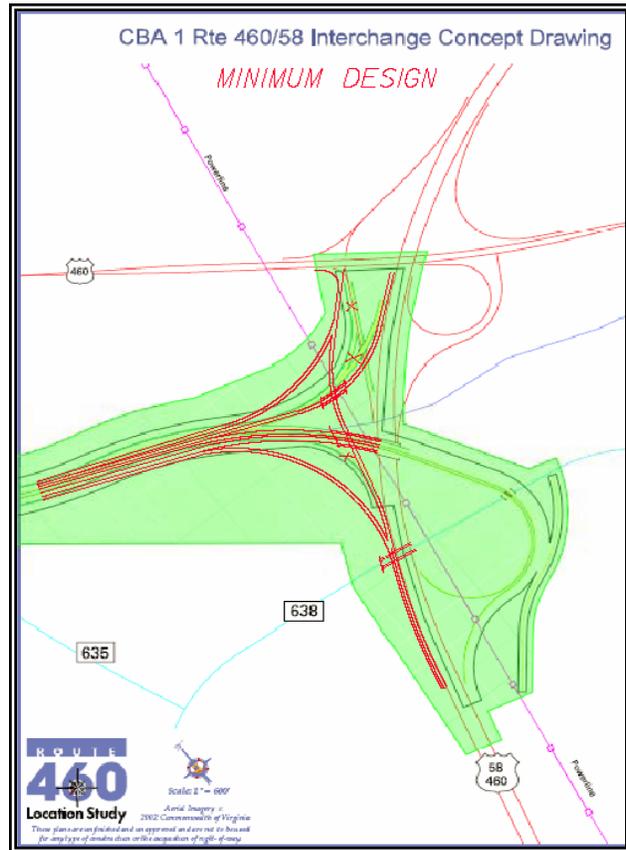


Figure 2-5. BASE Modifications – Rte. 58 Interchange

### 2.1.7. Intelligent Transportation System

The State of Virginia has deployed a statewide communications ITS infrastructure and integrated framework including a fiber-optic communication network as the backbone of the system. The backbone links the Virginia Smart Traffic Centers (STCs). The STCs within the vicinity of the project include the Hampton Roads STC and the Richmond STC. The ITS communications infrastructure for US 460 will have two major components:

- The communications links to the external ITS systems to reach/serve/support the applicable stakeholders; which in turn are already integrated, or will need to be included into the existing VDOT ITS Framework. These links will be implemented via T1-leased lines as required.
- The US 460 internal communications requirements and ITS system to operate the concession in accordance with agreements and regulations. The deployed backbone will be a fiber-optic Ethernet gigabit network.

### ITS ARCHITECTURE

The ITS Architecture implementation will follow the VDOT ITS Architecture hierarchical bundles as outlined in the VDOT Smart Travel Implementation Framework document. There will be some modifications due to the PPTA project type applicable to US 460.

The following functions are identified within the ITS Architecture:

- a) Operations and Maintenance Management to include:
  - o Assets inventory and management
  - o Automation of operations
  - o Internal Communications Services via a voice-over Internet phone service (VOIP)
  - o External Communications Services for normal and emergency modes and integration with stakeholders via high bandwidth-leased lines (T1 or T2) as required
- b) Traffic Control and Management: links systems inside and outside that manage traffic movement
- c) Incident Management: initiate response and links internal or public organizations to initiate the response and clear incident
- d) Travel Demand Management: programs to mitigate travel impact
- e) Archived Data: provides automation for data collection, archiving and sharing internally and with stakeholders as required
- f) Regulatory Traffic Functions: traffic regulations enforcement
- g) Emergency Management:
  - o Emergency Notification and Security: designated cell phone numbers for road support including the Virginia 511 system
  - o Emergency Vehicle Management: provide coordination for vehicle management of transportation services during disasters

- o Disaster Response and Hurricane Evacuation: provide for surface traffic control in the event of disasters
- h) Personal Travel Services:
  - o Internal: support for rest areas communications
  - o Cellular Phone Towers (by phone companies – not included)
  - o Interfaces with public operated telephone systems: POTS
- i) Commercial Vehicle Operations:
  - o WIM: weigh in motion system for load limitations enforcement
  - o AVC: vehicle classification for proper tolling charges
  - o Hazardous Material and Incident Response: future requirements for cargo ID determination and tracking

### **HURRICANE EVACUATION PLAN**

The Proposer understands the importance of upgrading US Route 460 for emergency evacuation. This route is very important particularly where access to I-64 could be blocked by closure of the Hampton Roads bridge-tunnel. During an evacuation, traffic control and planning is managed by the VDOT STC located in Virginia Beach.

The existing VDOT Hampton Roads Hurricane Traffic Control Plan will have to be modified/updated to reflect changed conditions.

- **Infrastructure Requirements**

The infrastructure required to implement the hurricane evacuation plan will include the components of ITS such as communication links, variable message signs, cameras, traffic sensors, weather stations, highway advisory radio broadcast and other traffic management or enhancement devices. In addition, it will require the following dedicated systems:

- Automatic or manual traffic reversal gates for eastbound lanes.
- Ramp closure gates at all ramps for closure of selected ramps as required by the evacuation plan.
- Ramp metering devices for west bound access ramps to control road oversaturation.

The overall control system will allow control to be transferred to the VDOT STC during an evacuation.

While hurricane evacuation infrastructure includes the dedicated systems previously outlined, it is dependant on the base infrastructure and systems that serve the ITS. The principal component being the fiber-optic communication backbone proposed for the US 460 development and the two redundant T1 connections to the Virginia STC.

All of the ITS systems are used to some degree in an evacuation situation. The weather stations, cameras and traffic sensors provide the meteorological and traffic conditions, highway advisory radio broadcasts and variable

message signs provide the feedback to traveling public. The information is also distributed to relevant emergency services and other stakeholders.

When a decision is made to reverse the traffic, ITS is used to transfer control to a VDOT Smart Traffic Center which in turn can control and monitor the dedicated lane closure and ramp metering devices as well as the traffic conditions through the ITS.

- **Physical Infrastructure**

To implement the functions of the ITS as outlined in the previous section the following components have to be implemented:

- a) US 460 ITS Operations Center
- b) Fiber-optic backbone and network nodes (Gigabit Ethernet)
- c) Variable- and fixed-message signs system
- d) Network camera system for surveillance
- e) Roadway traffic control and warning system
- f) Roadway automatic gate operation system with high-speed camera enforcement
- g) Weight in motion for commercial vehicles
- h) Automatic vehicle classification system (Required for selecting rate charge)
- i) Traffic counters at entrance/exit lanes
- j) Weather/meteorological stations

The above ITS components' tentative layouts for the BASE and BASE OPTIMIZED CASES are added as part of Additional Materials.

- **Electric Power Requirements**

It is anticipated that electrical power services will be required at each of the nine interchanges and the toll plaza. These will be obtained from the nearest available power source.

The toll plazas including the US 460 Operations Center Building and the Service Building will be provided with a 100kW emergency back-up diesel generator. The ramp toll locations will be provided with 15kW emergency generators for critical equipment.

The following loads are anticipated:

- a) ITS and communication devices
- b) Traffic control devices
- c) Toll collection and photo enforcement equipment
- d) Hurricane evacuation devices

- e) Roadway sign lighting
- f) Buildings lighting
- g) HVAC for buildings
- h) Pumping/drainage stations

The power requirements for the toll plaza and the Operations Center Building are estimated at 200kVA. The power requirement for each ramp toll location is estimated at 25kVA.

From the service location, power will be distributed to various locations along the road via underground duct bank system. The duct bank system will be divided into two sections, power and communications, each with adequate spare capacity for future expansion. The conduit system will extend throughout the length of the new road.

- **ITS Integration**

**Internal Integration** – The internal ITS devices in most cases will be physically integrated at the server level via a network or Ethernet connection. At the software level systems components are individually addressable and grouped with peer devices. Each system is independent and will run as clients in the wide area network. The proposed network is an Ethernet gigabit network that will provide maximum flexibility for future devices and expansion of the system.

**External Integration** – The US 460 ITS external integration with the outside stakeholders will be done electronically as much as possible via the VDOT ITS backbone. The equipment and systems configuration will include security features and protocols as recommended by the NITS and specific requirements for each stakeholder for all conditions. For redundancy, the proposed interface with the existing VDOT ITS backbone will be made at two locations: At the west end to Richmond STC and at the east end to Hampton Roads STC. Both connections will be made via T1-type leased lines.

### 2.1.8. Tolling System

The current operating toll facilities in Virginia rely on electronic toll collection (ETC) systems using either the Smart Tag or Smart Tag/EZ Pass, and manual/automatic toll collection. Automatic coin machines and credit card readers are used at some locations. All toll facilities depend on photo enforcement to deal with toll violators.

The proposed toll system for the US Route 460 Project assumes an open toll system. Two toll schemes are being proposed:

- Toll Scheme 1 will have seven diamond interchanges in addition to the two major interchanges at I-295 (west end) and Route 58 (east end). Toll Scheme 1 is part of the BASE CASE (see Additional Materials).
- Toll Scheme 2 will have three diamond interchanges instead of seven. The remaining four interchanges will be considered as part of future phased construction dependant on traffic characteristics. Toll Scheme 2 is part of the BASE OPTIMIZED CASE (see Additional Materials).

Both schemes will have one main toll plaza approximately mid-point of the Project.

The manual toll collection equipment will have the ability to operate in automatic mode during off hours at the ramps, and will have barriers. The equipment will accept coin, cash or credit cards.

The BASE CASE Proposal, Toll Scheme 1, consists of one main toll plaza in each direction and 14 toll ramps, with a total of 18 ETC lanes and 40 manual toll collection lanes. Manual stations will be designed for all users, i.e., coin, cash and credit card users. Manual stations will also be fitted with ETC devices for additional future flexibility. All ETC stations will be fitted with a photo enforcement system.

All toll stations will be interconnected via local area network at toll plazas, which in turn will be interconnected to the overall Intelligent Transportation System (ITS) backbone. There will be a link to the US 460 Operations Center where the information can be further distributed as necessary.

Each toll plaza and toll ramp will have:

- Radio Frequency Tag Reader System for Smart Tag
- Toll Booths Management System including traffic lane control and CCTV

Additional details of the proposed tolling system are shown as part of the ITS/TCS layouts added in Additional Materials.

Each toll collection location will be served by locally obtained electric power service and emergency back-up power.

The proposed configuration will allow sufficient flexibility for future enhancement as new technology becomes available. The main components such as power and communication links will remain essentially unchanged.

## 2.2. Assumptions used when developing the project.

### Right of Way:

- All Rights of Way will be acquired in the Commonwealth's name. The policy and procedures for acquiring rights of way are documented in VDOT's ROW Manual. We are fully aware of this procedure and will conduct our operations accordingly, unless mutually agreed upon deviations to the VDOT ROW acquisitions are pre-approved by VDOT.
- Right of way acquisition will be finalized before starting construction.

### Design and Construction:

- No major changes in design will be introduced once construction has started.
- There will be no significant change in laws that will affect the methods of construction.
- There will be no unexpected archaeological limitations.

- There will be no substantial conflict with endangered species.
- All environmental assessments will be positive.
- VDOT to finalize Environmental Impact process ( R.O.D.) by Fall 2006.
- Due to the fast track nature of the project, the Design and Build Team will develop the Design and perform the construction according to objective standards and specifications that are clearly defined in the contract documents. No subjective interpretations or personal preferences will be allowed to interfere with the implementation of the project.
- The Design and Build Team will be allowed to realize any benefits achieved through optimization of the Design occurring after final award of a contract.
- Complete contract plans and specifications will be developed meeting requirements for State and Local codes. In addition, all designs will be in accordance with AASHTO Policy and VDOT's applicable Division Manuals. Construction will utilize VDOT's Specifications and ASTM testing procedures. Inspection will meet or exceed VDOT's Quality Control.

#### Operations and Maintenance:

- The Concessionaire will be responsible for all operation and maintenance of the Facility. The Concessionaire will develop a Level of Maintenance commensurate with VDOT's current standards. Operation will be conducted in a manner that provides for the level of service that meets the public need.

### 2.3. Applicable Statues, Regulations and Standards

Indicate that the proposed project is consistent with applicable state and federal statutes and regulations, or reasonably anticipated modifications of state or federal statutes, regulations or standards. Demonstrate that the proposed design meets appropriate state and federal standards.

The proposed Project is being designed as a limited access toll road under VDOT design criteria for "Other Principal Arterial". All design and construction shall be designed and constructed in accordance with all applicable specifications, standards, and manuals, including, but not limited to the following:

- AASHTO Policy on the Geometric Design of Highways and Streets
- VDOT Road and Bridge Specifications
- VDOT Road and Bridge Standards
- VDOT Roadway Design Manual
- Virginia Erosion and Sediment Control Handbook

- Work Area Protection Manual
- Manual on Uniform Traffic Control Devices

In addition, each element will be designed and constructed in accordance with appropriate environmental and permitting documentation and other regulatory documents and plans. Any deviations will be addressed on a case-by-case basis.

#### 2.4. Identify and describe any work to be performed by VDOT.

Identify and fully describe any work to be performed by the Department or other public or private entities, specifically, but not limited to, the acquisition of right-of-way necessary for the project.

- Complete the NEPA process and obtain a Record of Decision (ROD) for the Project.
- VDOT will provide assistance in coordination with federal, state, and local governments and other interested agencies when necessary.
- VDOT will authorize the start of the permit procurement and assist in that effort.
- VDOT will support the ROW acquisition process to be undertaken by the Concessionaire to obtain properties where eminent domain is necessary.
- VDOT will be the owner and assume full responsibility of the facility after the concession term terminates.

#### 2.5. Federal, State and Local Permits and Approvals Required

Include a list of all federal, state and local permits and approvals required for the project, a schedule for obtaining such permits and approvals, and how any regulatory issues will be addressed. Identify which, if any, permits or approvals are to be obtained by the Department and have specific oversight requirements.

The proposed project corridor passes through environmental resources that will require close attention and consideration during project development. Some of the anticipated environmental permits and approvals required include the following:

##### **Federal Highway Administration (FHWA)**

- Approval of final EIS and record of decision (ROD)

##### **Farmland Protection Policy Act (FPPA)**

Requires completion of NRCS – CPA 106 form for determination of farmlands conversion impact rating for project.

- Schedule: Any mitigation considered has to be approved by all concerned prior to construction of the CBA (Candidate Build Alternative). All mitigation efforts are coordinated with the local, state, or federal agencies as necessary.

### Hazardous Materials

Federal and state databases are the source for determining and evaluating Hazmat potential. These include: CERCLIS (Comprehensive Environmental Response, Compensation and Liability Systems). Federal List of Treatment and Disposal (TSD); Facilities Subject to Corrective Action (CORRACTS); Under the Resource Conservation and Recovery Act (RCRA); Federal Emergency response Notification System (ERNS) List; State Leaking Underground Storage Tanks (LUST) List; State Registered Underground and Aboveground Storage Tanks (UST's/AST's) List.

- Schedule: Evaluations must be done during final design. Sites discovered may require some mitigation. Any mitigation measures would occur prior to or during the course of construction, depending on conditions.

### Historic and Archaeological Resources

Requires compliance with section 106 of the National Historic Preservation Act. Also section 4(F) of the U.S. Department of Transportation regulations must be complied with for impacts to public, recreational, wildlife – waterfowl refuges, and historical and archaeological areas eligible for or on the National Register of Historic Places.

- Schedule: The results of the section 106 process are complete once the memorandum of agreement is signed by the state and local authorities and both concur on the adverse/no adverse effect determination.

### Air Quality

Use of the National Ambient Air Quality Standards (NAAQS) to compare to existing and design CO concentrations. Use of Virginia Department of Transportation's (VDOT'S) Air Quality Analysis Consultant Guide, Revision 13. Use of the FHWA's manual for air quality considerations in environmental documents.

- Schedule: Study must be approved and documented in the final EIS. Project moving forward must conform to the SIP (State Implementation Plan) and comply with all applicable local, state, and federal regulations.

### Noise Impacts

Use of FHWA and VDOT noise assessment guidelines. FHWA standards are outlined in the 23 CR Part 772 Code of Federal Regulations – VDOT's regulations are outlines in the State Noise Abatement Policy which is consistent with FHWA standards.

- Schedule: Noise study must be approved and documented in the FEIS along with any approved abatement measures to be incorporated in the final design.

### Water Quality Permits Legislation, Executive Orders

All required permits and approvals will be identified during the Detailed Proposal Phase for this improvement program. Some of the permits that may be required are:

**Federal**

- ⇒ Section 404 (U.S. Army Corps of Engineers) – of Clean Water Act (Including Wetlands)
- ⇒ Section 107 - (Endangered Species Act)
- ⇒ Section 10 – Navigable Waters of the U.S.
- ⇒ Section 6(F) – (Land and water Conservation Act)
- ⇒ 11990 – Protection of Wetlands
- ⇒ 11988 – Flood Plain Management
- ⇒ Endangered Species Act – U.S. Fish and Wildlife

**State**

- ⇒ Virginia Water Protection Permit (VWPP) – State Department of Environmental Quality
- ⇒ Storm Water Management Program Permit – V.A. Department of Conservation and Recreation
- ⇒ Subaqueous Bed Permit (SBP) – Virginia Marine Resources Commission – Under Title 62.1 code of Virginia Endangered Species Impacts – Virginia Department of Game and Inland Fisheries
  - Schedule: All permits must be obtained; all legislation executive orders, regulations, guidance, etc. must be adhered to and approved in the FEIS and the ROD prior to construction of the selected build alternative.

**Local**

- ⇒ Temporary construction or staggered construction issues
- ⇒ Utility Relocations
- ⇒ Landfill or Borrow Areas
- ⇒ Hazmat clean-up prior to any R/W purchases
- ⇒ Land Conversion of Designated Agricultural/Forestal Districts – Approvals from affected localities. VDOT would submit a “Notice of Intent to Acquire Such Lands”
  - Schedule: Prior to and during the construction phase.

## 2.6. Impacts

Identify any anticipated adverse social, economic and environmental impacts of the project. Specify the strategies or actions to mitigate known impacts. Identify the positive social, economic and environmental impacts of the project.

### 2.6.1. Social

The US Route 460 Corridor Improvements Project is an important element of the regional transportation system. As such, it would provide mobility and accessibility for social interaction throughout the 55 miles it runs between US Route 58 in Suffolk, VA and I-295 in Prince George County, VA. Although much of the corridor is rural, there is potential for displacements of homes and businesses by the road alignment and by interchanges proposed for major intersecting roads. The Design and Build Team will strive to minimize these impacts through designs that would avoid displacements to the maximum extent possible. Unavoidable adverse impacts in this regard would be mitigated by relocating displaced families and businesses in a fair and equitable manner that does not discriminate on the basis of race, color, sex, or national origin and that respects the financial means of the displacees. The positive social impacts will be the potential for development that may be stimulated or accelerated by the provision of a major new highway with interchanges at cross roads that make land around those interchanges more attractive for development.

### 2.6.2. Economic

The proposed 460 Corridor Improvements Project will become a major artery of local and regional commerce by enhancing mobility among activity centers and by providing enhanced access to developable lands near the interchange areas. Beneficial economic impacts of the project would include generation of income for construction labor, equipment, and materials, much of which could accrue to local residents, businesses, and economies during the construction period. With completion of the project, the mobility and safety improvements will likely increase economic productivity and enhance the attractiveness of the corridor as a location for prospective businesses and industry. Some aspects of the operation of the completed roadway, such as the proposed toll facilities, also will provide employment opportunities.

Additionally, the US Route 460 Corridor Improvements Project will facilitate the growth of the Virginia Port Authority and the subsequent distribution centers/ intermodal parks. The Port Authority projects that it will handle over 3 million containers by the year 2030. The majority of the cargo is expected to be imported from Asia and will therefore need to be processed through a distribution center in order to prepare/ package it for shipping to retail. The Port Authority believes the US Route 460 Project complements their long range efforts. They are interested in evaluating the potential for a dedicated ramp from the 460 Toll Road to the Intermodal Park. They are also interested in future rail access to the park (developing an Intermodal Container Transfer Facility – for rail and road). The Consortium recognizes the importance of collaborating with the Virginia Port Authority to ensure adequate access is provided for their expansion efforts.

### 2.6.3. Environmental

Any time a new highway is put through undeveloped lands, negative environmental effects are possible. The proposed project corridor passes through environmental resources that will require close attention and consideration during project development. Some of the anticipated environmental considerations include the following:

- **Air Quality**

Owing to the mostly rural nature of the corridor and the ongoing reductions in emissions rates from motor vehicles, air quality impacts of the project are not expected to be significant.

- **Waters and Wetlands**

There are streams and wetlands that the project will cross. Installation of drainage structures (culverts and bridges) will necessarily impact them. Impacts may include the loss of aquatic and wetland habitats and their functions due to direct displacement by the expanded footprint of the roadway and from temporary siltation during construction. The contractors will employ erosion and sediment controls to minimize the adverse effects of siltation. All applicable federal and state water quality permits will be acquired from the appropriate agencies and the construction will be accomplished in strict accordance with the terms of those permits. Finally, losses of streams and wetlands that may occur will be compensated in a manner to be negotiated with the regulatory agencies during the permit acquisition process.

The following potential adverse environmental impacts have been identified at this stage of the process. As the project is developed it is anticipated that more specific impacts can be identified:

- Relocation and displacements of residences and businesses
- Increased noise levels
- Disturbance of vegetation and wildlife habitats
- Disturbance of jurisdictional waters and existing wetlands
- Hazardous materials used during construction
- Disruption of public facilities and services
- Impacts to historical properties

The following potential positive environmental impacts have been identified at this stage of the project procurement process.

- Reduction in traffic congestion in the area
- Reduction in fuel consumption due to reduced traffic congestion
- Reduction in the amount of air pollution due to idle vehicles
- New higher quality wetlands created due to mitigation
- Cleanup of existing debris and hazardous materials within the ROW footprint

## 2.7. List critical factors for project's success.

List the critical factors for the project's success. Provide a description of the proposed management of the project's design and construction phases. Include an overview of the Offeror's plans for quality control and quality assurance during all phases of the project.

### 2.7.1. Critical Factors for Project Success

The critical factors for the success of the Project are outlined below. These factors are to be considered and thoroughly analyzed by the Proposer during the Detailed Proposal Phase, in order to achieve the necessary level of comfort.

- Project support from affected agencies
- Project support from affected jurisdictions
- Project support from the public
- VDOT support during the ROW acquisition process
- Timely completion of ROW acquisition process
- Moreover, there are some other outstanding issues regarding Design and Construction that have also been identified:
  - collaboration between the Owner's representatives and the Consortium in order to guarantee the success of the project,
  - minimization/mitigation of environmental impacts,
  - timely completion of permit procurement and approval process,
  - timely completion of utility relocations and adjustments,
  - conflict resolution procedures among the different stakeholders (including the Owner)

### 2.7.2. Design and Construction Management Approach

Ferrovial Agroman (FA) as General Contractor will establish a Design Management Team (DMT). This procedure has been streamlined over many toll road projects successfully delivered by the Ferrovial Group. Most communications between the FA construction personnel and the Design Consultants will be conducted through this Design Team. It is Ferrovial Agroman's experience that this process greatly contributes to a smooth project delivery, establishing clear lines of responsibility and favoring ordered communication between the external Design Consultants and the Construction Personnel during the construction of the works. As General Designer, FA will appoint **Earth Tech Inc.** a company with ample experience in similar highway projects. Relevant references, resumes and other relevant data for the consultant as specified in the SFP requirements have been included as part of TAB 1 Section 1.2 and 1.4 the Proposal.

Successful projects depend on adhered to a rigid Project Control Process, which entails four key steps as follows:

- **Plan:** Schedule and cost baselines will be established in sufficient detail to account for the full definition of scope with acceptance and 'buy-in' of all team members.
- **Measure:** Progress will be monitored on regular basis with current status measured against the established schedule and cost baselines. Commitments to date and incurred cost will be captured and prediction of cost and schedule through to project completion given monthly.
- **Report:** Variances to schedule and cost baselines will be reported on regular basis with the potential impact on the project highlighted. Regular risk analysis will be carried out to confirm the adequacy of contingency and probability of meeting the schedule.
- **Mitigate:** Corrective actions for adverse schedule and cost variations will be taken with the focus on resolving significant deviations.

### 2.7.3. Quality Control/Quality Assurance

Compliance with VDOT's Quality Control Checklist, prior to all submittals and work to be performed will be a key and integral part of the QC/QA Plan proposed by the Concessionaire for all phases of the Project. It is the experience of the Proposer and its Team to routinely perform internal technical peer reviews by staff with the same or greater expertise in the technical work being carried out, but who are independent to the project team.

The Consortium is committed to providing the highest possible level of quality throughout all phases of project development. Our in-house review team ensures our responsibility to the Department to provide exceptional quality services.

## 2.8. Applicable State and Federal Environmental Statues, Regulations and Standards

Indicate if the proposed project is consistent with applicable state and federal environmental statutes and regulations. Demonstrate that the proposed design meets appropriate state or federal environmental standards and adequately addresses air quality conformity. Proposers shall note that proposal development costs are not reimbursable. In the event of selection as a developer and in the event of successful negotiation of an interim agreement or comprehensive agreement, reimbursement for any at-risk preliminary work performed by the proposer is contingent on completion of the environmental review process and in accordance with any specific provisions within an executed interim or comprehensive agreement.

### 2.8.1. Describe if project is consistent with applicable state and federal environmental statutes, regulations and standards

In review of the Route 460 Location Study (DEIS, May 2005), it has been determined that the candidate build alternatives for the proposed project adequately addressed and demonstrated consistency with all statues, regulations, standards for the Environmental Issues, including but not limited to:

- Purpose and need and alternative analysis

- Socio/economic impacts
- Hazardous material impacts
- Air and noise impacts
- Water quality impacts
- Geologic issues
- Historic and archaeological resources and impacts
- Terrestrial Ecology, wildlife habitat, biodiversity, endangered species, etc.

**2.8.2. Does the proposal adequately address air quality conformity?**

Construction activities for the selection alternative will be performed in accordance with VDOT’s road and bridge specifications. The specifications are approved as conforming to the State Implementation Plan (SIP) and require compliance with all applicable regulations as previously stated. It has been determined the proposed project will have little effect on existing levels and the CO concentrations for each build alternative will actually decrease in the design year. The long range plan for the Hampton Roads/Richmond – Petersburg regions has been found to conform to the SIP for the Route 460. The selected new location alternative would require a new conformity finding.

**2.9. Propose allocation of risk and liability for post agreement work, and assurances for timely completion and safe operation of the facility.**

Propose allocations of risk and liability for post agreement work and assurances for timely completion and safe operation of the project.

Table 2-2 contains our suggested and assumed allocation of risks between the Grantor (VDOT) and the Concessionaire for the Project.

RISK ALLOCATION	GRANTOR	CONCESSIONAIRE
Project requirements/Preliminary design	■	
Right of way – Access to the Land	■	■
Environmental permits	■	
Setting the toll rates (initial/yearly update)	■	■
Changes in Law	■	
Force Majeure	■	■

RISK ALLOCATION	GRANTOR	CONCESSIONAIRE
Design		■
Geotechnical		■
Utilities		■
Archaeological	■	
Construction		■
Operation and Maintenance		■
Traffic		■
Financing Conditions (market)		■
Interest rates from tender to contract award		■
Financing structure		■
Termination for convenience	■	
Alternative competing routes	■	
Tolling Violators	■	■
Pre-existing Hazardous Materials	■	

Table 2-2. Proposed Allocation of Risks

The Concessionaire will be responsible for the construction implementation on behalf of VDOT. In addition, the Concessionaire will enter into a lump sum, fixed delay design & build agreement with the Design Build Joint Venture (DBJV) in which Ferrovia Agroman will be involved. Thus, under this standard business model all contractual responsibilities related to design and construction will be directly passed from the Concessionaire to Ferrovia Agroman, or the DBJV (if applicable), under a lump sum, back-to-back or mirror contract. The Concessionaire will add appropriate clauses to the Tender Agreement with the DBJV to ensure timely completion of the construction activities.

## 2.10. State assumptions related to ownership, legal liability, law enforcement and operation

Clearly state the assumptions related to ownership, legal liability, law enforcement and operation of the facility.

The following assumptions are made and relevant in case of the Proposer being awarded a Comprehensive Agreement for the operation and maintenance of the 460 Toll Road during a to be determined concession term.

### Project Ownership

- The Concessionaire will recognize VDOT as the Grantor of the project.
- The Concessionaire will use, develop, finance, design, construct, lease and operate the 460 Toll Road.
- At the end of the concession term, the Concessionaire will return (transfer) the facility to the Grantor.

#### Legal Liability

- The Concessionaire will be solely and entirely liable, before VDOT, for its obligations as expressed in the Comprehensive Agreement.
- The Concessionaire will be sole responsible, before VDOT, for the operation and maintenance services and the activities necessary to support them.

#### Law enforcement

- The Concessionaire will rely on the Virginia State Police to ensure law enforcement along the 460 Toll Road during the concession term as per the Comprehensive Agreement.

#### Operation

- The Concessionaire will become entirely responsible, before VDOT, of all operation and maintenance services corresponding to the 460 Toll Road.
- The Operator will have the right to collect tolls corresponding to the 460 Toll Road.
- The Concessionaire will return (transfer) the facility in a serviceable condition at the end of the concession term.

#### 2.11. Provide information on any phased openings proposed prior to final completion of the work

Provide information on any phased (partial) openings proposed prior to final completion of the work.

As part of the BASE OPTIMIZED CASE, previously described in Section 2.1.4, phased openings of diamond interchanges are proposed. The initial construction to take place, only includes the construction of the major connection with I-295 and Route 58, in addition to three diamond interchanges (VA 156, VA 40 and US258).

The remaining intersections will be considered as part of future phased construction dependant on traffic characteristics.

#### 2.12. Include a schedule and plan to maintain this facility. Define assumptions or responsibilities during the operational phase including law enforcement, user fee collection and maintenance

Include a schedule and plan to maintain this facility in conformance with standards acceptable to the Department. The proposal should clearly define assumptions or responsibilities during the operational phase including law enforcement, user fee collection and maintenance.

Cintra proposes to maintain the facility using the Virginia Department of Transportation (VDOT) standards and guidelines. The Concessionaire will develop performance targets for each roadway asset and develop an annual maintenance plan to ensure compliance. Cintra proposes a maintenance program based on the following categories: preventative maintenance, routine maintenance, facilities maintenance, traffic operations, and capital maintenance.

- **Preventative Maintenance** - The preventative maintenance includes activities to prolong the life and slow deterioration of the facility. Cintra proposes to develop and implement an annual schedule for these activities. Examples of these activities are crack sealing, under drain inspection and cleaning, bridge joint cleaning, and inspection of safety devices.
- **Routine Maintenance** - The routine maintenance includes activities to preserve the facility with emphasis on the safety, functionality, and aesthetics. Again, Cintra proposes to develop an annual plan for the routine maintenance activities. Examples of these activities are roadway patching, shoulder repair, drainage repair (ditch and pipe cleaning), minor bridge deck patching, snow removal, and mowing.
- **Facility Maintenance** - The facility maintenance includes all activities to preserve the administration buildings, maintenance lots, toll plazas, and toll booths. Cintra will develop an annual plan to ensure each facility is properly maintained.
- **Traffic Operations** - The traffic operations activities include providing safety patrols, motorists' assistance, and Intelligent Transportation Systems to enhance the mobility throughout the corridor. This operation is especially critical because the corridor serves as a link between two major regions in Virginia. Additionally, the corridor serves as an alternate hurricane evacuation route.
- **Capital Maintenance** - The capital maintenance includes activities intended to improve the service of the facility and rehabilitate assets that are in use beyond their original life cycle. Examples of these activities would include roadway surface rehabilitation, bridge deck replacement, or reconstruction/ widening of the facility.

In order to accomplish the activities listed above, Cintra proposes to employ maintenance crews for each aspect of the program (road/ bridge, facility, toll/ITS, and safety service patrols).

### 2.13. Other alternatives: ENHANCED CASE

The Proposer sees the ENHANCED CASE as a premium alternative to significantly improve the transportation needs of the area as well as provide a financial benefit to the Commonwealth of Virginia and its taxpayers.

Cintra proposes improvements and benefits to both the US Route 460 and the I-64 Corridors.

#### 2.13.1. Approach

Cintra proposes to develop the US Route 460 Project as stated in previous sections. In addition, Cintra proposes construction of capital improvements, operation and maintenance and collection of tolls corresponding to long-distance trips, along I-64 from milepost (MP) 200, I-295 interchange, to approximately MP264, I-64 and I-664 interchange.

As part of the Capital Improvements related to the US Route 460, the ENHANCED CASE upgrades the previously defined BASE CASES by proposing innovative solutions regarding interchanges that would substantially improve the traffic patterns of the area by 1) maintaining the functionality described by the Concept Interchanges, related to CBA 1, and 2) adding direct connectors for major movements. This CASE also contemplates the construction of all seven diamond interchanges as defined by CBA 1 before commencement of the concession term.

As part of the Capital Improvements related to the I-64, the ENHANCED CASE proposes to widen, within the existing median, the existing 2 + 2 lane configuration section from milepost (MP) 200, the I-295 interchange, to approximately MP 254 where a 3 + 3 lane configuration section begins. The widening would consist in adding 1 lane in each direction.

### 2.13.2. Conceptual Design

#### PROPOSED IMPROVEMENTS DETAILS

The enhanced design will include innovative solutions regarding interchanges. The Proposer has identified the following improvements as part of the ENHANCED CASE.

- **I-295/460 Interchange**

The enhanced design concept would include the BASE CASE modifications of the Existing I-295/US 460 cloverleaf interchange to provide directional ramps from westbound US 460 to southbound I-295 and also from southbound I-295 and eastbound US 460 (Figure 2-4). Additional loop ramps at the US 460/460 Toll Road interchange and at the SR 630 interchange would also be included (Figure 2-6). Although portions of the enhanced design will fall outside of the approved corridor, good access to the New Bohemia area will be provided with a design that meets or exceeds the current standards for all the major traffic movements.

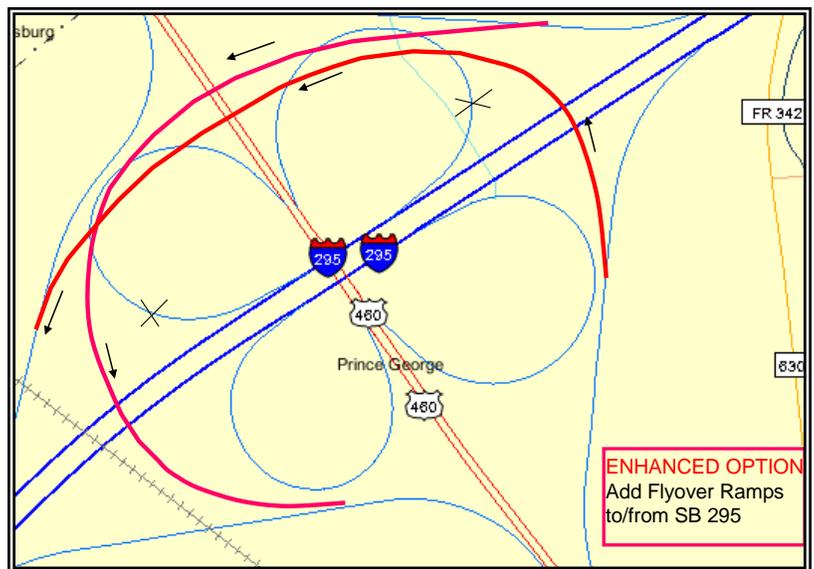


Figure 2-6. ENHANCED Improvements - I-295 Interchange

- **US 58/460 Interchange**

The enhanced option would provide directional ramps for all the major movements between 460 Toll Road and US 58. Existing connections between US 58 and Existing US 460 will be maintained and additional connections between the 460 Toll Road and Existing US 460 will also be provided. The advantage of this design is that weaving issues will be eliminated as well as the reverse curve problem area for northbound US 58 traffic (Figure 2-7).

### 2.13.3. ITS

The ENHANCED CASE proposes the implementation of a complete IT System along both the US Route 460 Project, as described in Section 2.1.7, and similarly for I-64 from MP200 to MP264.

### 2.13.4. Tolling System

The ENHANCED CASE also proposes the implementation of a mixed toll system allowing both manual and electronic toll collection.

The toll scheme proposed for the US Route 460 project would be the same as the BASE CASE Proposal.

The toll scheme proposed as part of the I-64 Corridor, from MP200 to MP264, consists of installing a mainlane toll plaza, similar to the one proposed for US Route 460, north of the City of Williamsburg to collect tolls from both northbound and southbound long-distance traffic. The exact location of the mainlane toll plaza is to be determined.

### 2.13.5. Operations and Maintenance

As part of this alternative the Concessionaire would fully operate and maintain the US Route 460 Project and the I-64 from MP200 to MP264.

The Concessionaire shall take advantage of the opportunity to operate and maintain both facilities and utilize any synergies that may arise.

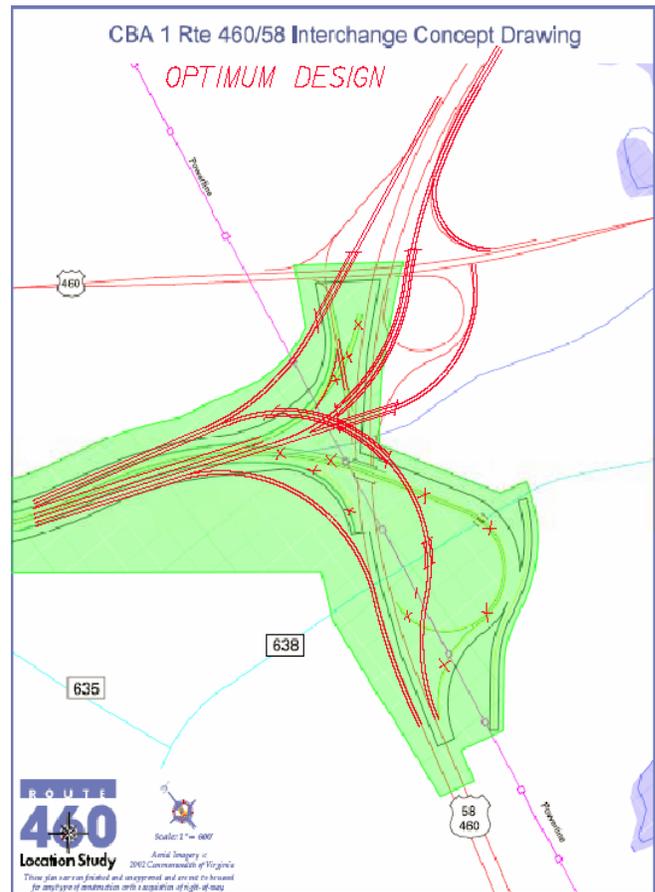


Figure 2-7. ENHANCED Improvements – Rte. 58