

*Phase Three*

## Detailed Proposal for Improvements to the Interstate 81 Corridor



September 5, 2003



KBR0503



Working with VDOT to Make I-81 Safer for Everyone



September 4, 2003

Mr. Malcolm T. Kerley, P.E.  
Chief Engineer for Program Development  
Virginia Department of Transportation  
1401 East Broad Street  
Richmond, Virginia 23219

**Re: Phase Three Detailed Proposal – Improvements to I-81 Corridor**

Dear Mr. Kerley,

The I-81 corridor improvement project demands a team capable of successfully handling large complex projects with multiple delivery methods. The team STAR Solutions assembled more than two years ago is the best qualified for this project, offering the synergy of previous VDOT experience, expertise in specific subject areas as well as financial strength.

STAR Solutions has diligently worked to develop what is an innovative solution to the design-build-operate-finance of I-81. Our plan of finance is balanced and complete, without funding shortfalls. The STAR Solutions' plan was formulated after gaining the insights of key stakeholders, including VDOT, local governments and others who have a vested interest in this project. Through this collaboration, VDOT is assured of unparalleled opportunities that will:

- Produce a safe, cost-effective, efficient and maintainable highway
- Provide expert knowledge of local conditions pertinent to Level of Service design criteria, right-of-way requirements, utility relocation and construction methods
- Apply lessons learned from other major VDOT road projects.

In addition to our Detailed Proposal, this submittal includes revisions to our Phase One Conceptual Proposal that was submitted on January 17, 2003. Three original STAR Solutions' team members — Michael Baker Jr. Inc., The Louis Berger Group, Inc. and Vanasse Hangen Brustlin, Inc. — asked to be released from the team to be able to pursue the I-81 Tier 1 EIS project. These changes, as well as other updates regarding the Public Support and Project Benefit/Compatibility sections, are reflected in our revised document.

Our commitment to VDOT is focused. Our priority team is poised and ready to go to work immediately!

Sincerely,

James W. Atwell  
STAR Solutions Team Member



# COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION  
1401 EAST BROAD STREET  
RICHMOND, VIRGINIA 23219-2000

PHILIP A. SHUCET  
COMMISSIONER

MALCOLM T. KERLEY, P.E.  
CHIEF ENGINEER FOR PROGRAM  
DEVELOPMENT

August 29, 2003

Mr. James W. Atwell  
President  
Commonwealth Service Company  
2108 W. Laburnum Avenue, Suite 210  
Richmond, Virginia 23219

**Re: PPTA Proposal Confidentiality Request for I-81**

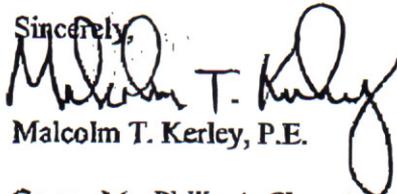
Dear Mr. Atwell:

I am in receipt of your letter dated August 21, 2003 in which you request that certain information submitted as part of the above-referenced conceptual proposal be treated as confidential and proprietary. As we have discussed, information previously exempted in my January 31, 2003 letter will remain exempted.

Concerning new information in your detailed proposal, in accordance with the applicable statutes governing such matters (Section 2.2-3705.A.56 of the Code of Virginia), I am granting your request that the sections of your proposal highlighted in your letter dated August 21, 2003 be held confidential and proprietary subject to the following:

- The official submittal that will be available to the public clearly defines and identifies the use of all public funds and other financial commitments of the Commonwealth.
- Upon a detailed review of your proposal, the Department reserves the right to rescind all or any part of this exemption. Before the Department exercises this option, you will be afforded an opportunity to discuss this decision with us.

Sincerely,



Malcolm T. Kerley, P.E.

Copy: Mr. Philip A. Shucet  
Ms. Barbara W. Reese



August 21, 2003

Mr. Malcolm T. Kerley, P.E.  
Chief Engineer for Program Development  
Virginia Department of Transportation  
1401 East Broad Street  
Richmond, Virginia 23219

**RE: PPTA Proposal Confidentiality Request**

Dear Mr. Kerley,

I am writing on behalf of STAR Solutions, a consortium of firms led by Kellogg Brown & Root, Koch Performance Roads, English Construction Company, Wilbur Smith Associates, APAC, Inc., W-L Construction Company and Adams Construction Company, who plan to submit a Phase Three Detailed Proposal on September 5, 2003 in response to VDOT's request for proposals for improvements to the I-81 corridor in Virginia.

In accordance with the applicable statutes governing such matters (2.2-3705.A.56 of the Code of Virginia), we are requesting that the sections of our proposal filed in accordance with the Public-Private Transportation Act and the RFP that are highlighted be held confidential and proprietary. This section of our proposal responds to four of the questions in your letter dated July 1, 2003 and addresses the following areas:

- Commitments and Obligations
- Preliminary Finance Plan
- User Fees and Other Revenue Sources
- Business Plan

It is our contention and belief that said section qualifies as it describes a method of financing with narrative text and supporting pro formas. Accordingly, we seek your written assent and assurance that said sections and the information contained therein shall be exempt from all Freedom of Information Act request.

Should you have any questions, please contact me at (804) 340-0205.

Sincerely,

James W. Atwell  
STAR Solutions Team Member

# Conceptual Proposal Improvements to the I-81 Corridor

September 5, 2003 (Revised)

Submitted by STAR Solutions, a consortium of:

- APAC, Inc.
- Adams Construction Company
- English Construction Company, Inc.
- KBR, Inc.
- Koch Performance Roads, Inc.
- W-L Construction & Paving, Inc.
- Wilbur Smith Associates

Contact:

James W. Atwell  
President

Commonwealth Service Company  
2108 West Laburnum Avenue, Suite 210  
Richmond, Virginia 23227  
804.340.0205  
804.377.2301 fax  
jatwellcsc@aol.com

This proposal or quotation includes data that shall not be disclosed outside VDOT and shall not be duplicated, used or disclosed — in whole or in part — for any purpose other than to evaluate this proposal or quotation. If, however, a contract is awarded to this offeror or quotor as a result of — or in connection with — the submission of this data, VDOT shall have the right to duplicate use or disclose the data to the extent provided in the resulting contract. This restriction does not limit VDOT's right to use information contained in sheets throughout the proposal as identified at the bottom of affected pages.



KBRO603



**STAR**  
Solutions

Safer Transport And Roadways

Working with VDOT to Make I-81 Safer for Everyone

## Tab 1 Qualifications & Experience

### 1.a Legal and Organizational Structure

***Identify the legal structure of the private entity making the proposal. Identify the organizational structure for the project, the management approach and how each firm, partner, contractor and major subcontractor in the structure fits into the overall team.***

Safer Transport and Roadways (STAR) Solutions submits this proposal to the Virginia Department of Transportation (VDOT) to design, build, operate and finance the widening of Interstate 81 (I-81), provide a 20-year pavement warranty and operate an electronic truck tolling system under a public-private partnership. The improvements will run 325 miles, the entire length of I-81, from the City of Bristol to the West Virginia state line north of Winchester.

STAR Solutions is a consortium led by long-time Virginia and world-class design and construction firms with previous VDOT experience, bringing expertise in all specific subject areas as well as financial strength. The distinguishing advantage that VDOT receives from this team is STAR Solutions has been working on a solution for I-81 for two years. Our team has developed design concepts, performed constructability review, developed a feasible financial plan and secured federal funding sources beyond VDOT's normal appropriations. Additionally, our team members have proven highway and road experience to deliver a complete solution and obtain input and support from stakeholders. The STAR Solutions team includes:

- APAC, Inc.
- Adams Construction Company
- English Construction Company, Inc.
- KBR, Inc.
- Koch Performance Roads, Inc.
- Lehman Brothers
- Morgan Keegan & Company, Inc.
- Salomon Smith Barney
- W-L Construction & Paving, Inc.
- Wilbur Smith Associates

*A successful project begins with a strong team. For two years, STAR Solutions team members have worked together analyzing the I-81 corridor and identifying cost-effective solutions.*

Public-private partnerships are most successful when there is truly a partnership between the private sector and VDOT. There are tremendous benefits to a project when both the public and private sectors work together to formulate solutions and implement and execute it. STAR Solutions is committed to partnering with VDOT every step of the way. If we are selected to develop I-81, we want to be a member of VDOT's team, with VDOT actively participating in the design of the project. We view this partnership spanning through construction and O&M.

### Legal Structure

STAR Solutions is a strategic collaboration developed to provide VDOT with the best possible combination of local knowledge and experience, management expertise, technical capabilities, financial strength and quality resources needed to improve I-81. KBR, Inc., hereinafter referred to as KBR, is the principal contractual entity of the team. We understand that teamwork is achieved through communication and coordination, combined with proven project management processes. These are key ingredients to successfully developing the cooperation necessary to blend multiple participants into a cohesive solution-oriented team with a common focus.

## 1.a Legal and Organizational Structure

***Identify the legal structure of the private entity making the proposal. Identify the organizational structure for the project, the management approach and how each firm, partner, contractor and major subcontractor in the structure fits into the overall team.***

### **Organizational Structure and Management Approach**

STAR Solutions' approach to forming this team more than two years ago was built on principles that include a commitment to Virginia firms, depth of staff resources, proven track record, successful performance with VDOT and special expertise needed for the work. All members of our team are committed as a single group entity to the execution of this project. STAR Solutions will be directly accountable to VDOT and other involved entities, proactively establishing and maintaining confidence in the project team's performance.

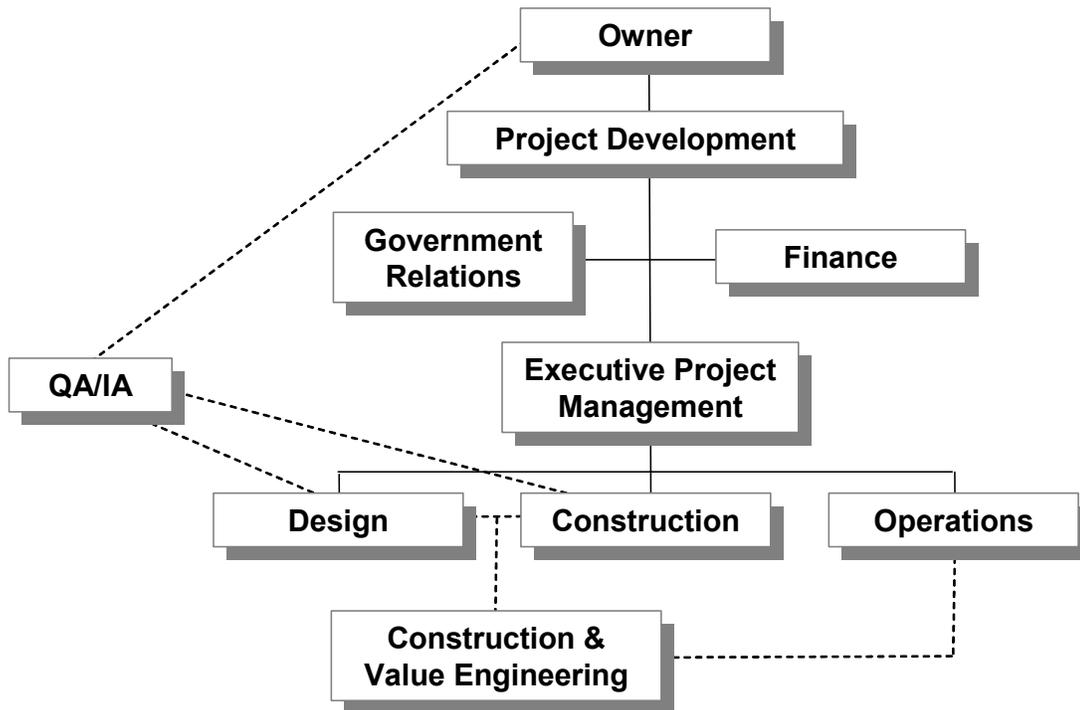
We will use each team member's resources to build a seamless organization that is responsive to the needs of the project and to the flexibility and innovative potential of the design-build-operate-finance contract. This structure allows a fast-track approach with concurrent engineering and construction programs. The project team will function with one fully integrated "project umbrella" organization of management, supervision, support and services staff, drawing upon the strength and diversity from each team member, eliminating unnecessary duplication of functions. With the synergy created by combining the experience, financial resources and technical know-how of these firms, STAR Solutions possesses the strength to see this project through to successful completion.

*We have significant resources in Virginia and are committed to the Commonwealth and VDOT.*

The STAR Solutions' management approach will draw on the experience and expertise of the customer, team members and individuals responsible for various activities to ensure the project is designed and built to meet cost, quality, and schedule. The management approach will flow from the comprehensive agreement and individual team agreements. Those parties identified in the organizational chart on page 1-3 will manage responsibilities and risk allocation within their specific roles. The lead program manager for the project is KBR. KBR's project manager will orchestrate the entities and activities underway and will be the primary point of contact with VDOT. We will work with VDOT to ensure that we create an environment where the STAR Solutions team works effectively with the VDOT project team. The project manager will rely heavily on the Executive Project Management team and in turn each major activity team as the work progresses.

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### STAR Solutions' Functional Teams

Owner	
<i>Role: Contract and Legal</i>	<ul style="list-style-type: none"> <li>• VDOT = Principal Leader</li> <li>• FHWA = Partner</li> <li>• Commonwealth of Virginia = Partner</li> </ul>
Project Development (PD) Team	
<i>Role: Proposal development, customer and affected 3rd party needs, team creation and team agreements</i>	<ul style="list-style-type: none"> <li>• KBR = Principal Leader PD team</li> <li>• Koch Performance Roads = Co-Leader PD team</li> </ul>
Government Relations (GR)	
<i>Role: Public relations, fiscal support and customer satisfaction</i>	<ul style="list-style-type: none"> <li>• McGuireWoods Consulting = Principal GR team leader</li> <li>• Koch Performance Roads = Team member (principal construction PR)</li> <li>• Public/Private Strategies Consult = Team member</li> </ul>

### 1.a Legal and Organizational Structure

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Finance	
<b>Role: Bonding and financial risk assessment</b>	<ul style="list-style-type: none"> <li>• Salomon Smith Barney = Principal team leader</li> <li>• Commonwealth Service Company = Team member</li> <li>• Lehman Brothers = Team member</li> <li>• Morgan Keegan &amp; Company = Team member</li> </ul>
Executive Project Management (EM) Team	
<b>Role: Quality, engineering, schedule and cost</b>	<ul style="list-style-type: none"> <li>• KBR = Principal Leader EM team</li> <li>• APAC = Phase leader</li> <li>• Adams Construction Company = Phase leader</li> <li>• W-L Construction &amp; Paving = Phase leader</li> <li>• English Construction Company = Phase leader</li> <li>• Salomon Smith Barney = Team member</li> <li>• Koch Performance Roads = Team member</li> <li>• Wilbur Smith Associates = Team member</li> </ul>
Design	
<b>Role: Plans –Environmental/bridge/geometric/pavement/hydraulic/traffic and specifications</b>	<ul style="list-style-type: none"> <li>• Wilbur Smith Associates = Principal team leader</li> <li>• American Consulting Engineers = Section leader</li> <li>• KBR = Team leader member</li> <li>• Thompson + Litton = Team member</li> <li>• CH2M Hill = Team member</li> <li>• Earth Tech = Section leader</li> <li>• Greenhorne &amp; O’Mara = Team member</li> <li>• HDR = Team member</li> <li>• HNTB = Team member</li> <li>• Hayes, Seay, Mattern &amp; Mattern = Section leader</li> <li>• Koch Performance Roads = Pavement designer</li> <li>• Parsons Brinckerhoff = Section leader</li> <li>• Qk4 = Team member</li> <li>• Rummel, Klepper &amp; Kahl = Team member</li> <li>• SITE-Blauvelt Engineers = Team member</li> <li>• URS Corporation = Section leader</li> </ul>

## 1.a Legal and Organizational Structure

**Identify the legal structure of the private entity making the proposal. Identify the organizational structure for the project, the management approach and how each firm, partner, contractor and major subcontractor in the structure fits into the overall team.**

Construction	
<b>Role: Build it on schedule, on budget, on quality</b>	<ul style="list-style-type: none"> <li>• KBR = Principal team leader</li> <li>• APAC = Phase leader</li> <li>• Adams Construction Company = Phase leader</li> <li>• Branch Highways = Team member</li> <li>• English Construction Company = Phase leader</li> <li>• Fairfield Skanska = Team member</li> <li>• Lanford Brothers = Team member</li> <li>• Moore Brothers Company = Team member</li> <li>• W-L Construction &amp; Paving = Phase leader</li> </ul>
Operations	
<b>Role: Tolling and facility maintenance</b>	<ul style="list-style-type: none"> <li>• TransCore = Principal team leader (tolling)</li> <li>• Koch Performance Roads = Principal team leader (warranty)</li> <li>• Northrop Grumman = Team member</li> <li>• Iteris = Team member</li> </ul>
Construction & Value Engineering	
<b>Role: Construction support value proposal</b>	<ul style="list-style-type: none"> <li>• KBR = Principal team leader</li> <li>• Wilbur Smith Associates = Co-team leader</li> </ul> <p><i>Includes all design and construction firms.</i></p>
Other Specialty Disciplines	
Austin Brockenbrough & Associates Hurt & Proffitt TBE Group Volkert & Associates	Woolpert Burgess & Niple Wiley & Wilson

This project will be managed as a design-build type project with coincident activities conducted to ensure efficiency and lessons learned are incorporated into subsequent work. Construction and design will interact to ensure the best information is used to accomplish the project goals. The value engineering function will facilitate this iterative activity and will include operational considerations to promote life cycle cost valuation in addition to cost and schedule. Each major functional team will be responsible to advise and report to the executive management team to ensure coordination of schedule, quality and cost. Independent firms will be accountable to VDOT directly to manage quality assurance and independent assurance with the added protection of pavement quality managed in conjunction with the long-term performance warranty. The government relations and finance functions will be active initially and transform as the project design and construction begins into direct management of community relations and communications. Customer representation and input will be at the option of the customer for all teams identified in the organization.

## 1.a Legal and Organizational Structure

***Identify the legal structure of the private entity making the proposal. Identify the organizational structure for the project, the management approach and how each firm, partner, contractor and major subcontractor in the structure fits into the overall team.***

Partnering efforts will be critical to this project to ensure that all entities have a clear understanding of the project's primary goals. The partnering process will be facilitated by a third party to set goals, enhance the team's performance, while still working within the contractual obligations and client expectations. Further, this partnering process will allow team members to reduce "red tape" by providing a pre-determined set of steps to make decisions, identifying a point person responsible for primary project functions, and developing a process for including key community leaders on project issues relevant to them.

A primary management focus will be on management of risk. Those individual team members who are in the best position to manage those risks will be empowered to do so through teaming contracts that allocate risks, specify roles, responsibilities, authorities, and decision rights. For instance, allocation of federal design standard application to plans and specifications is most appropriate with registered professional designers who are identified on the team. Similarly, assignment of differing site conditions to a construction firm is more sensible. At this stage of project development, STAR Solutions expects that each major functional area previously identified will be managed by the Principal Team Leader, with shared risks with other team members of that functional area. Specific individual assignments will be made and personnel identified during subsequent project development activities.

*An opportunity may exist for VDOT to participate in the construction and value engineering activities and benefits in conjunction with an equitable exchange of other project risks.*

## 1.b Team and Key Principals' Experience

***Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.***

As previously outlined, the STAR Solutions partner team members include APAC, Adams Construction Company, English Construction Company, KBR, Koch Performance Roads, Lehman Brothers, Morgan Keegan & Company, Salomon Smith Barney, W-L Construction & Paving, and Wilbur Smith Associates. Collectively, these firms have more than 700 years experience in all aspects of transportation planning, design, construction and financing and are experienced in successfully delivering major projects for VDOT. Other members include key design firms and financial, operations, legal and public involvement consultants. Firms on our team have demonstrated their commitment to this project through exclusive teaming agreements.

*This powerhouse of talent is only available to this PPTA proposal for I-81. Team members are exclusive to STAR Solutions.*

## 1.b Team and Key Principals' Experience

*Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.*

### **STAR Solutions Program Management**

#### **APAC, Inc.**

APAC, the nation's largest asphalt and concrete paving company, has revenues of \$2.7 billion. A subsidiary of Ashland, Inc., APAC's roots go back more than 100 years. From Frederick J. Warren's grant of a patent for Bithulithic pavement, Warren Brothers was merged with Ashland Oil and Refinery Company of Ashland, Kentucky. The name of the company was later changed to APAC.

APAC's 12,000 employees are part of Ashland's 25,000 customer-focused team working to bring superior product and service solutions to industries and consumers around the world. APAC operations are located in 14 states.



*The STAR Solutions team includes APAC, the team leader for Route 288, who was awarded the 2002 International Road Federation's Global Road Achievement Award for design.*

#### **Route 288, Richmond, Virginia (PPTA Project)**

APAC was the prime contractor for VDOT to deliver the \$236 million Route 288 project. This project completes the western outer loop around Richmond and its scope includes 17.5 miles, including 10 miles of new four-lane highway and the expansion of seven miles of existing highway. There will be six new interchanges constructed and the two existing interchanges will be modified and expanded. Also included in the scope are the widening of two existing bridges and constructing 23 new bridges, two of which cross 150 feet above the James River.

#### **Adams Construction Company**

Adams Construction Company is the largest privately owned hot mixed asphalt producer in Virginia, currently producing more than one million tons per year. The firm was founded in 1946 and has paved numerous portions of the interstate highway system, as well as other highways in Virginia, North Carolina, Florida and West Virginia.

#### **U.S. Route 460**

Adams is currently working on the Christiansburg/Blacksburg Bypass on U.S. Route 460 in Montgomery County, Virginia. This project required 575,000 metric tons of hot mix, all produced and placed by the firm. Adams employs approximately 300 people and has asphalt plants strategically located along the I-81 corridor from Dublin in Pulaski County to near Woodstock in Shenandoah County, covering approximately 175 miles.

## 1.b Team and Key Principals' Experience

*Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.*

### **English Construction Company, Inc.**

English Construction Company has been in the construction contracting business for 92 years. English is currently ranked as the 278<sup>th</sup> largest construction contractor in the U.S. by *Engineering News-Record*. Approximately 57 percent of the firm's revenues are from transportation-related projects, with the remainder coming from general building and water/wastewater projects.

The firm maintains a staff of more than 1,000 employees in construction and support teams that, under the leadership of 120 tenured personnel, have served as many as 40 concurrent projects. The English organization has extensive experience in highway and bridge construction performing an average volume of more than \$100 million per year in roadway work. English is the principal contractor on Virginia's first PPTA project, Route 895, the Pocahontas Parkway. The firm was the recipient, with VDOT, of a 1996 award from the Associated General Contractors of America for excellence in partnering on a VDOT project in the Staunton District. English and VDOT shared this recognition on VDOT's first partnering project.

### **KBR, Inc.**

KBR, Inc. is owned by Halliburton Company and is the lead firm in STAR Solutions. The firm's major lines of business include engineering, construction, project management and facilities maintenance. Brown & Root was founded in 1919 as a Texas road builder and grew into an engineering and construction business with more than 260 offices and 40,000 employees worldwide. Subsequent to a 1998 merger with Dresser Industries and the M.W. Kellogg Company, the Brown & Root engineering and construction business became KBR. KBR has a record of performance on lengthy trans-national links to complex interchanges and bridges and have been involved with several international tollroad and turnpike projects. The firm consistently ranks among the top five engineering and construction firms by *Engineering News-Record* and has more than 80 years of experience in staffing, managing and successfully completing construction projects throughout the world.

#### **Dulles Greenway Toll Road, Virginia**

The Dulles Greenway is a four-lane controlled access divided toll road running 14 miles from Dulles Airport west to Leesburg, Virginia. The Dulles Greenway was the first private toll road to be built in the U.S. in more than 100 years. In addition to being the lead firm in the design-build project, KBR took a 14 percent equity position in the project. KBR successfully managed more than \$70 million in subcontracts while overseeing in-house work crews and all minor subcontracts associated with the project. At the same time, KBR had responsibility for providing the designer with a variety of design phase services.



***KBR managed more than \$70 million in subcontracts, contributing to completion of the Dulles Greenway without cost overruns or schedule delays.***

## 1.b Team and Key Principals' Experience

***Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.***

### **Koch Performance Roads, Inc.**

Koch Performance Roads, Inc. is a wholly owned subsidiary of Koch Materials Company, the largest buyer and seller of asphalt products in the US and Mexico, currently operating about 100 terminals, laboratories and other facilities around North America. *Transportation Builder* recently ranked the firm 5<sup>th</sup> in its top 25 federal construction contractors.



***Koch Performance Roads brings the experience of working with VDOT on projects like Route 288 to the STAR Solutions' I-81 Project.***

Organized in 1996, and officially incorporated in 2000, Koch Performance Roads offers a unique and flexible approach to reduce life-cycle and user costs through an innovative process that integrates pavement design, local materials, project management, public information/involvement, safety, maintenance techniques and performance warranties.

The firm's performance warranty addresses pavement distresses such as rutting, cracking, potholes and smoothness. Koch Performance Road's ability to offer a warranty and assume risk traditionally held by DOTs is

made possible through the use of several innovative and proprietary products and paving systems engineered to provide higher performance than conventional materials.

### **Route 288, Richmond, Virginia (PPTA Project)**

Approximately 17.5 miles remain in completing the outer loop around Richmond, Virginia. Koch Performance Roads is part of APAC's team on this previously described project, which was named one of the top 10 projects in the U.S. by *Roads and Bridges*. Koch Performance Roads is responsible for asphalt pavement design, mix design, quality assurance and independent assurance. They are also managing the processes for keeping the public informed.

It is estimated that these innovative processes and the benefits that accrue from developing the project under the PPTA will save Virginia taxpayers \$47 million. Koch Performance Roads will also provide a 20-year, performance-based asphalt pavement warranty that will all but eliminate the need for VDOT to expend resources for maintenance and repair of the pavement, thus allowing these resources for use on other roads within VDOT's maintenance and repair program.

### **New Mexico State Road 44 (Now US Route 550)**

Mesa Project Development Contractor (PDC), a company owned by Koch Performance Roads, partnered with the New Mexico State Highway and Transportation Department (NMSHTD) to reconstruct and widen SR 44 (a NAFTA corridor highway) by the end of 2001. The project involved the reconstruction and widening of approximately 120 miles of a two-lane state highway northwest of Albuquerque into a four-lane facility, the only such corridor in the Four Corners Area. The project has received numerous awards, including the National Quality Initiative for its long-term pavement warranty.

## 1.b Team and Key Principals' Experience

***Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.***

The project creates economic development opportunities in northwestern New Mexico, provides a first-of-its-kind performance-based warranty and sets a new standard for road construction in the state. According to calculations done by the state, the project could save the taxpayers \$89 million.

NMSHTD contracted with Mesa PDC to manage and design the project, to develop construction contract packages for public bidding, to manage the successful bidders during construction, and to provide an extended warranty on the improvements.

NMSHTD and Mesa arranged funding for the development and construction costs through GARVEE bonds issued by New Mexico. The bonds are secured by a pledge from the state of all FHWA funds designated for the project. The federal government also committed approximately \$420 million to this project over the next 15 years.



***Koch Performance Road's US 550 project involved widening 120 miles of two-lane highway to four lanes.***

### **Lehman Brothers**

Founded in 1850, Lehman Brothers is a global investment bank with leadership positions in municipal finance, advisory, corporate finance and securities sales, trading and research. Lehman Brothers was the first to establish reliable public market access for power, waste-to-energy, toll road and gas pipeline projects.

#### **Connector 2000 Association, Greenville, South Carolina**

In February 1998, Lehman Brothers underwrote \$200 million of Toll Road Revenue Bonds for the Connector 2000 Association, a South Carolina non-profit corporation established to facilitate the financing, construction and operation of the Greenville Southern Connector Project. The project consists of a 16-mile, four-lane tollway and 1.5-mile extension of South Carolina Route 153. Upon completion, the Connector will serve as the southeastern section of a beltway around the Greenville metropolitan area.

### **Morgan Keegan & Company, Inc.**

Morgan Keegan is one of the South's largest investment firms. Through more than 140 offices in 13 states, Morgan Keegan serves individual investors in the Southern U.S. and institutional clients throughout the U.S. and abroad. They are members of the New York Stock Exchange and other major exchanges. Morgan Keegan & Company was acquired in March 2001 and became a subsidiary of Regions Financial Corporation, one of the nation's 25 largest bank holding companies. With more than 2,400 employees and more than \$300 million in equity capital, Morgan Keegan is an established leader in the financial services industry in the South.

## 1.b Team and Key Principals' Experience

*Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.*

### **Salomon Smith Barney**

Salomon Smith Barney (SSB) has been the leading senior manager in the municipal transportation sector in each year since 1997. During this period, SSB has underwritten more than 160 surface transportation issues with a total par value of more than \$31 billion. These financings have included many new transportation credits, including new toll credits for the Central Texas Turnpike System, the Orange County (CA) Transportation Corridor Agencies, Highway 407 (Canada), and the New Jersey Turnpike Authority. Other new transportation credits developed and senior managed by SSB include Las Vegas Monorail, New Jersey Transit's and Michigan DOT's GARVEE programs, Route 3 North Transportation Improvements Association, and State DOT highway credits for Arizona, Colorado, Georgia, Kansas, Louisiana, Missouri and Oklahoma.

SSB serves public and private transportation clients with 12 New York-based transportation specialists and a network of experienced transportation bankers located in 18 U.S. regional offices. SSB's commitment to transportation is by far the largest of any investment banking firm and enables the firm to provide their clients with the highest quality service and depth of coverage for more than a decade. SSB's transportation practice encompasses all transportation modes — toll, highway, transit, passenger and freight rail, airports, seaports and parking — as well as product expertise in federal GARVEE and TIFIA initiatives. In developing and implementing the I-81 plan of finance, SSB is ready, willing, and able to commit all of the firm's significant resources to ensuring a successful, world-class financing program.

#### **Central Texas Turnpike Project**

The \$2.2 billion financing for the Central Texas Turnpike Project, which SSB senior managed for the Texas Transportation Commission in August 2002, represents one of the largest and most innovative inaugural toll credits and is a new template for innovative use of the federal TIFIA credit assistance program. The closing of a TIFIA Secured Loan Agreement allowed SSB to structure "double A" rated bond anticipation notes ("BANs") for 40 percent of the financing. The project benefited from a cost-free forward interest rate hedge on the takeout financing for the BANs, since the fixed rate on the committed TIFIA Loan was established based on July 2002 market conditions. In addition, Texas DOT's funding of a portion of the project's capital costs and operating and maintenance expenses assisted in obtaining the best credit ratings ever achieved for a "greenfield" toll project.

### **W-L Construction & Paving, Inc.**

W-L Construction & Paving, Inc. is primarily involved in grading, paving and stone crushing. Paving operations consists of 600,000-700,000 tons per year. The firm was founded in 1964 and has grown to be one of the larger contractors in Southwest Virginia with approximately 250 personnel. W-L is owned by Mountain Enterprises and performs in excess of \$560 million per year.

### **Wilbur Smith Associates**

Recognized as one of the nation's leaders in transportation planning and facilities, Wilbur Smith Associates (WSA) has completed more than 15,000 projects covering all 50 states, virtually every major metropolitan area in the U.S. and more than 100 nations throughout the world. Established in 1952, WSA maintains more than 35 offices in the U.S. and a network of overseas offices.

## 1.b Team and Key Principals' Experience

*Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.*

The firm has been providing transportation engineering services in Virginia for more than 30 years and understands VDOT's issues. WSA maintains a staff of more than 75 roadway, bridge and traffic-engineering professionals in its Virginia offices. With this depth of personnel, WSA has the qualifications, experience and resources necessary to undertake challenging projects and accelerated schedules.

### **I-81 Improvements, Rockbridge County, Virginia**

WSA is currently designing 11 miles of improvements to I-81. The project is one of the larger sections of current VDOT projects and is one of the first I-81 corridor projects to be let. Design includes widening from two to three lanes in each direction as well as the reconstruction of two interchanges, one of them a system interchange with I-64. The project also involves the design of a truck climbing lane for the entire length of the northbound roadway section, and evaluation, widening or replacement of 12 bridges.



*The STAR Solutions I-81 project brings the experience of transportation design leader Wilbur Smith Associates.*

## **Engineering**

### **American Consulting Engineers PLC**

American Consulting Engineers was formed in 1969 to meet the growing needs of the public in the transportation and civil engineering fields. American has operations in Virginia, Kentucky, Illinois, Indiana and Texas and employs a staff of more than 150 engineers, planners, surveyors and technicians. American specializes in freeway, expressway, and toll road planning and design, urban and rural highway and street design, and bridge planning and design. In 2001, the firm received the American Consulting Engineers Council's Grand Conceptor Award for Engineering Excellence for design of the Maysville Cable Stayed Bridge between Maysville, Kentucky and Aberdeen, Ohio.

### **CH2M HILL**

For 56 years, CH2M HILL has been providing a full spectrum of services for the transportation industry, including planning, siting, permitting, engineering/design, and construction management. CH2M HILL maintains an integrated network of more than 200 offices around the world with more than 12,000 employees. The company is currently ranked 10<sup>th</sup> in transportation design by *Engineering News-Record*. CH2M HILL is part of the team providing design-build services for the 17.5-mile segment of Virginia Route 288, one of the largest projects awarded under the Commonwealth's Public-Private Transportation Act.

## 1.b Team and Key Principals' Experience

***Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.***

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### **Earth Tech**

Earth Tech was founded in 1970 and is an international provider of global water management and transportation, engineering and environmental services. Earth Tech employs more than 8,000 people, has 160 offices worldwide and is a member of Tyco International, Ltd. The firm's transportation division serves corporate and public sector clients globally and is ranked by *Engineering News-Record* as a top 20 transportation design and management firm. Relevant experience includes preparing 1,000-mile corridor studies, providing program management for privatized toll roads and developing Intelligent Transportation Systems.

### **Greenhorne & O'Mara, Inc.**

Founded in 1950, Greenhorne & O'Mara, Inc. (G&O) is a multidisciplinary engineering firm that employs nearly 700 professionals in more than 25 full-service and project offices along the Eastern seaboard. As a nationally recognized firm, G&O is currently ranked 118<sup>th</sup> by *Engineering News-Record* in its list of the top engineering firms in the US, and 40<sup>th</sup> in transportation services. Transportation services represent approximately 50 percent of their total business, and include right-of-way acquisition and utility coordination services. G&O has held multiple contracts with VDOT to perform utility relocation and design services since 1991 and has coordinated utilities on projects ranging in size from the Woodrow Wilson Bridge and Springfield Interchange in Northern Virginia to primary projects in the Bristol area. G&O also performed the utility coordination and relocation services on the Pocahontas Parkway (Route 895) project in Richmond.

### **HDR, Inc.**

HDR is a full-service multi-disciplinary firm with more than 3,000 people employed in more than 60 offices nationwide. The firm has been in business since 1917 and since that time, repeat business stands at 80 percent, a clear indication of client satisfaction and confidence. Professional publications consistently rank HDR among the leading consulting and design firms. *Engineering News-Record* has ranked HDR as the number 20 firm in the United States this past year. HDR has worked in all 50 states and has served hundreds of local and municipal agencies throughout the United States.

### **HNTB Corporation**

Founded in 1914, HNTB is one of the country's leading architecture, engineering, planning and construction services firms, providing services throughout the U.S. and around the world. With more than 3,000 employees and more than 60 offices nationwide, HNTB offers a full complement of services across multiple disciplines, including surface transportation, aviation, architecture, environmental engineering, construction services, and urban design and planning. Listed as *Engineering News-Record's* 4<sup>th</sup> largest transportation firm, HNTB has provided design and construction services for federal, state and local agencies on highways in nearly every state and more than half of America's toll roads. HNTB's Virginia offices have nearly 40 years of history working with VDOT and in 1997 was recognized as "Consultant of the Year."

## 1.b Team and Key Principals' Experience

***Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.***

### **Hayes, Seay, Mattern & Mattern, Inc.**

Founded in Roanoke in 1947, Hayes, Seay, Mattern & Mattern (HSMM) is one of Virginia's largest resident transportation design firms, with more than 55 years experience as a VDOT partner in planning, designing, and improving Virginia's transportation infrastructure. HSMM was one of the first consulting firms contracted by VDOT for interstate highway location and design work, beginning with the first segment of I-95 in Virginia, followed by numerous other significant projects throughout the state. HSMM has more than 450 skilled professional, technical and support personnel and is currently ranked 18<sup>th</sup> among U.S. engineering/architectural firms by *Building Design & Construction*. HSMM recently performed studies/designs for improvements on I-81 in the Winchester area, at the intersection with I-77 in Wytheville, and at the intricate Exit 150 upgrade. Further, the firm is a study/design partner in the Coalfields Expressway project, and completed preliminary studies for the proposed I-73 corridor and for widening U.S. Route 340 in Page and Warren Counties.



***Design team members such as HSMM are experienced working in the I-81 corridor. Project shown is the upgrade of I-81 in Botetourt County.***

### **Parsons Brinckerhoff Quade & Douglas, Inc.**

Founded in 1885, Parsons Brinckerhoff Quade & Douglas, Inc. (PB) is one of the oldest continuously operating consulting engineering firms in the U.S. *Engineering News-Record* consistently ranks PB among the top transportation firms. With more than 9,000 employees throughout more than 300 offices worldwide, the firm provides comprehensive services in all elements of transportation planning, including traffic forecasting, corridor studies, Environmental Impact Statements for highway and transit projects, Major Investment Studies and public involvement programs, as well as preliminary engineering, final design and construction management services for highway and other transportation projects.

PB has been providing planning and engineering services for transportation projects throughout Virginia for more than 40 years, including the Richmond-Petersburg Turnpike and the Hampton-Roads Bridge Tunnel. PB was the lead designer for the Route 895 (Pocahontas Parkway) project – the first successfully completed project using the PPTA process. Over the years, VDOT has counted on PB's Virginia offices in Herndon and Norfolk to provide quality and innovative planning and design services for many of Virginia's most visible projects — from transportation planning for the Western Transportation Corridor Study in Northern Virginia, I-64 Major Investment Study between Richmond and Hampton Roads and I-73 Location Study in southwest Virginia, to engineering and design projects such as the Route 29 Bypass around Charlottesville and the replacement of the Coleman Bridge in Yorktown, Virginia.

## 1.b Team and Key Principals' Experience

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### **Qk4**

Qk4, established as Presnell Associates, Inc. in 1974, is one of the largest full-service, professional consultants based in the Commonwealth of Kentucky, and has eight operating offices throughout the country. The firm is ranked number 236 in the Top 500 Design Firms by *Engineering News-Record*. Qk4 has designed hundreds of miles of transportation infrastructure, ranging from residential roads and rural highways to major interstate highways. With 200 dedicated, experienced employees, Qk4 has thorough knowledge of FHWA and AASHTO design policies, NEPA, CEQ, NHPA, environmental permitting, and public involvement.

### **Rummel, Klepper & Kahl LLP**

Rummel, Klepper & Kahl (RK&K) has been providing transportation design services throughout the mid-Atlantic and southeastern regions of the U.S. for more than 60 years. RK&K's expertise in transportation has propelled the company to rank among *Engineering News-Record's* national list on of the top 50 firms in transportation and the top 25 firms in highways. RK&K serves an array of federal, state and local governments and private clients from the southern limits of North Carolina to the northern limits of Pennsylvania. Current projects include providing right-of-way and construction plans for the reconstruction and widening of 4.6 miles of I-81 in Rockingham County and the City of Harrisonburg, including the complete reconstruction of the Exit 243 interchange within the city.

### **SITE-Blauvelt Engineers, Inc.**

SITE-Blauvelt Engineers was founded in 1947 and has more than 450 professionals and technical support staff located in offices throughout the East Coast. The firm is currently rated the 38<sup>th</sup> largest transportation engineering firm in the country. For 45 years, SITE-Blauvelt has provided engineering design and QA inspection services to VDOT and served as the prime designer, geotechnical engineer and test boring contractor for a portion of the Pocahontas Parkway Route 895 project.

### **Thompson + Litton**

Thompson+Litton (T+L) was established in Wise, Virginia in 1956. With a staff of 91 engineers, architects, land-use planners, construction administrators and grant/financing specialists, T+L has a proven track record of providing transportation-related planning as roadway design services, as well as natural resources data collection and analysis throughout Southwest Virginia. The majority of T+L's highway experience has been with the Virginia Department of Transportation; however, the firm is currently providing roadway design services to the Tennessee Department of Transportation and the West Virginia Department of Highways as well as several local government entities.

## 1.b Team and Key Principals' Experience

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### **URS Corporation**

Over the past five years, URS has grown into one of the industry's leading engineering, environmental and construction services firms serving government agencies and private industrial and commercial companies worldwide. URS' professional staff includes engineers with expertise in the full spectrum of disciplines required for this project, including planners, scientists, environmental specialists, information management specialists, architects and construction managers. URS provides services for all types of infrastructure projects such as roads, bridges, tunnels, rail and transit systems, airports, water supply and wastewater facilities and power transmission and distribution facilities. Founded in 1951, URS is a publicly owned company listed on the New York and Pacific Stock Exchanges. The company has 15,600 employees and operations in 30 countries.

## **Financial**

### **Commonwealth Service Company**

Commonwealth Service Company was founded in 2000 by VDOT'S former Assistant Commissioner of Finance, James W. Atwell. The company provides a broad array of transportation consulting services. These services include legislative lobbying, project financing and public-private ventures. Its client base includes several large cities and counties in the Commonwealth, transportation advocacy groups and national project development and consulting engineering groups, as well as numerous state contracting and engineering firms. Either as a public employee or as the president of this company, Jim Atwell has been involved in almost all the PPTA projects since the program started in 1995.

## **Public Involvement**

### **McGuireWoods Consulting LLC**

McGuireWoods Consulting is a wholly-owned subsidiary of the McGuireWoods law firm and has been providing government relations, public relations and business expansion services for four years. Based in Richmond, Virginia, with offices in Tyson's Corner, Virginia and Washington D.C., McGuireWoods Consulting is the largest and most diverse public affairs firm in the Commonwealth.

The firm has played a role in two of the four successful PPTA proposals awarded to date in the Commonwealth. The MWC team worked closely with Koch Performance Roads and APAC on the Route 288 project in Chesterfield, Powhatan and Goochland Counties. McGuireWoods Consulting also provided government relations and community outreach assistance to Route 288 Corridor Improvements, LLC for the Route 288 widening project in Fairfax and Loudoun Counties. Outside of the PPTA process, McGuireWoods Consulting has represented a number of clients in helping to secure funding for transportation projects throughout Virginia, many of which have been significant economic development opportunities.

## 1.b Team and Key Principals' Experience

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### Construction

#### **Branch Highways, Inc.**

Branch Highways is a Virginia corporation headquartered in Roanoke and has been successfully contracting in the Southeastern U.S. for more than 45 years. With full-service civil and heavy construction expertise, Branch's successfully completed work includes highways, bridges, site work for commercial, industrial, residential and resort projects, airport construction, dams, emergency response projects, and landfills. Recent individual contracts with the Virginia and North Carolina Departments of Transportation and other public agencies range from \$1 million to more than \$40 million. The firm's bonding capacity exceeds \$350 million.



***Our team includes  
Virginia's most  
experienced highway  
and paving contractors.***

#### **Fairfield Skanska, Inc.**

In 1998, Echols Brothers, Inc. and Fairfield Bridge Company, Inc. were purchased by Skanska, Inc. The two companies were merged and the name was changed to Fairfield Skanska, Inc. The two predecessor companies, Echols Brothers and Fairfield Bridge Company had been in the road, bridge, utility and heavy construction business for 70 and 35 years, respectively. Fairfield Skanska continues with the same organization and experience of the two companies from which it was formed. Approximately 80 percent of the company's business is highway and bridge work for VDOT. Relevant projects include the bridges and approaches for Route 29 Bypass over the James River and the interchange for the Route 29 Bypass and Route 460, both near Lynchburg.

#### **Lanford Brothers Company, Inc.**

Lanford Brothers Company was founded in 1960 by J.C. and S.F. Lanford. Since then, the firm has operated continuously, providing highway and heavy construction services in Virginia, West Virginia, Tennessee, North Carolina and South Carolina, working for such clients as VDOT, West Virginia Department of Highways, and various cities, counties and turnpike authorities. Lanford Brothers has extensive experience operating in all types of weather and routinely provides services for bridge repairs, new bridge and box culvert construction, asphalt and concrete surface milling, and latex and polymer concrete overlays.

#### **Moore Brothers Company, Inc.**

Moore Brothers has been active in highway construction in Virginia since 1948, building many of the state's most traveled roads and bridges, including portions of Interstates 64, 66, 81, 85 and 495. As an increasing number of major construction projects have involved reconstruction and expansion of major urban highway systems, Moore Brothers has been a leader in solving the resultant issues of scheduling, traffic control, phased construction and safety. Proud to be the successful bidder on VDOT's first Contractor Quality Control (CQC) contract in 1996, Moore Brothers completed more than \$35 million of construction on four subsequent CQC contracts.

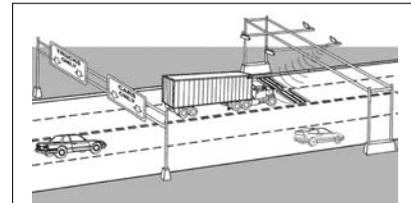
## 1.b Team and Key Principals' Experience

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### Operations

#### **TransCore**

TransCore, a privately held company, is the world leader in toll collection and services for mobile payment. With installations in 37 countries, more than 150 patents and a world-class manufacturing center, their expertise is unparalleled in the ground transportation services industry. Throughout the world, TransCore has been providing leading systems for intelligent transportation, parking and access control, rail and inter-modal asset tracking and toll and traffic violation enforcement for more than 60 years.



***Team member TransCore will design a boothless electronic tolling system that will maintain smooth traffic flow.***

#### **Northrop Grumman Mission Systems**

Northrop Grumman is the largest provider of systems integration and information technology systems and services to the U.S. Government and the single-largest employer in Virginia. Northrop Grumman is the only systems integrator with hands-on experience in both public safety and transportation management systems — designing, developing, delivering, operating and maintaining systems that help save lives. The firm is the leader in building Dispatch Command Centers and ITS Systems, bringing together all of the command, control, communications systems, emergency management and transportation components necessary to assure the public's safety.

#### **Iteris, Inc.**

Iteris, Inc., a subsidiary of Odetics, Inc., is the technology leader in systems and sensors for surface transportation. Iteris has combined outdoor image processing, traffic engineering, and information technology to offer a broad range of telematics and transportation solutions. The firm is a leader in the ITS industry, designing and implementing software-based solutions that enable public agencies to reduce traffic congestion and provide greater access to traveler information.

### Other Specialty Disciplines

#### **Austin Brockenbrough & Assoc., LLP**

Austin Brockenbrough & Associates is a multi-discipline consulting engineering firm located south of Richmond, Virginia in Chester. Formed in 1955, Austin Brockenbrough & Associates provides civil engineering, surveying, mechanical engineering and electrical engineering services to a wide variety of public and private clients. The firm's services include transportation/highway design, site work and development, water and wastewater treatment facilities, utilities, environmental, GIS and other similar services and surveying services to governmental agencies, architects and private owners throughout the State of Virginia and beyond.

## 1.b Team and Key Principals' Experience

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### **Burgess & Niple, Inc.**

Burgess & Niple (B&N) is a multi-disciplined consulting engineering firm providing specialized services for transportation, utility infrastructure, environmental, and land development projects. Founded in 1912 and ranked number 67 of the top 100 "pure" design firms by *Engineering News-Record*, in 2002, B&N has approximately 650 employees in 15 offices in the United States. B&N's Mid-Atlantic Region, which consists of five offices located in Virginia and Maryland, has been involved in the transportation design and construction industry in Virginia since 1974. In the past decade, B&N has been involved in many important transportation projects, including the Woodrow Wilson Bridge, Dulles Toll Road, Springfield Interchange, the Columbus Multi-Modal Transportation Terminal, the Discovery Bridge, and the Light Rail Study for the City of Richmond.

### **Hurt & Proffitt, Inc.**

Hurt & Proffitt was founded in 1973 when Charles F. Hurt, PE & Associates merged with the land surveying firm of Erskine W. Proffitt, LS to provide professional consulting services. Since that time, the firm has grown to 85 employees. Hurt & Proffitt has a nearly 30-year history of providing comprehensive engineering, surveying and planning services to the public and private sectors of Virginia. The firm's public sector clients include counties, cities, towns, public service authorities, and various state agencies, including the Virginia Department of Transportation, the Virginia Department of Conservation and Recreation, the University of Virginia, Virginia Tech, James Madison University, and several community colleges. In 1996, Hurt & Proffitt instituted an Employee Stock Ownership Plan.

### **Public/Private Strategies Consult, Inc.**

Public/Private Strategies Consult, Inc. (PPS), formerly known as The DeLay Group, P.C., is a strategic planning and governmental affairs consulting firm based in Houston, Texas, with offices in Washington, D.C., Austin, Texas, and Huntsville, Alabama. PPS, specializing in civil infrastructure and economic development for 14 years, has provided innovative strategic planning, legal advocacy and intervention services to produce permanent, cost-effective public/private solutions to their clients' business and government related needs. The firm has been instrumental in multiple state and federal projects, including highway trade corridors such as Interstate 69, and led the initiative to establish the Border/Corridor funding category in TEA-21.

### **TBE Group, Inc.**

TBE Group is a full-service transportation consulting engineering company. Founded in 1984, TBE presently serves DOT clients in 38 states from 26 offices, including a Richmond, Virginia, office. The firm offers full transportation planning, design and construction management services, as well as a wide variety of drainage, environmental, and permitting services. TBE is the national leader in Sub Surface Utility Engineering and Utility Coordination and is pre-qualified with VDOT for SUE Services as well as ROW Acquisitions Services and Cost-To-Cure Studies. TBE has been recently recognized as one of the industries fastest growing firms, ranked 234<sup>th</sup> by *Engineering News-Record*, with a staff of more than 400 engineers and technical personnel.

## 1.b Team and Key Principals' Experience

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### **Volkert & Associates**

Volkert & Associates continues to be ranked as one of the top engineering, architectural, planning, and environmental consulting firms in the United States. *Engineering News-Record's* Top 500 Design Firms Sourcebook 2002 ranks Volkert 198<sup>th</sup> overall and 47<sup>th</sup> in transportation out of the 500 firms listed. Since 1925, Volkert has been providing transportation services through two main divisions — roadways and structures. The firm's 13 offices are staffed by 600 multi-disciplined employees who provide services for major interstate projects, both rural interstate and urban expressway; state and county roads; interchange improvements; tunnels; and complex multilevel interchanges.

### **Wiley & Wilson, Inc.**

Wiley & Wilson is a full-service professional architectural and engineering firm, serving a broad range of clients. The firm maintains four Virginia offices with approximately 125 persons composed of registered engineers, architects and planners as well as designers, CAD specialists, surveyors, resident inspectors, and other personnel. The firm has a long history in providing roadway design, bridge design and feasibility studies to VDOT.

### **Woolpert LLP**

Founded in 1911, Woolpert LLP consistently ranks among the top national design firms in *Engineering News-Record's* annual evaluation. With offices located throughout the US, the firm is a privately held, limited liability partnership and employs more than 700 in-house professional and technical personnel. Founded in the early 1900s, Woolpert provides roadway design and inspection services, including urban and rural highway design, utility relocation design, noise barriers and pavement management. Woolpert provided roadway design on 28 miles of the I-95/697 Interchange in Stafford County, Virginia.

## **Key Principals**

The specialized expertise that STAR Solutions offers to VDOT is evidenced by the technical expertise of our staff, the multi-disciplined nature of the designated personnel and the overall quality of the services and deliverables that we will provide to VDOT. The following individuals will assure dedication of resources to accomplish this project:

### **John C. "Jack" Lanford, President and CEO, Adams Construction Company**

Jack has held this position since 1985. Previously, he was a founder of Lanford Brothers Company, Inc., where he is presently chairman of the board. He is a graduate of the Virginia Military Institute with a B.S. in Civil Engineering. Jack has 48 years of experience in highway and heavy construction, having worked on projects in Virginia, West Virginia and North Carolina.

### **John McAleer, Vice President, Major Project Groups, APAC, Inc.**

With more than 30 years experience in engineering and construction, John's expertise is in project development and execution of large design-build projects. He was selected to participate in the President's Commission on Executive Exchange during President Reagan's second term.

## 1.b Team and Key Principals' Experience

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He also spent a year in Washington, D.C., as Special Assistant to the Assistant Secretary of Defense where he worked with the military to evaluate and develop methods to improve their design and construction process. John is the chairman of the Advisory Council for The Citadel's School of Engineering, where he received his B.S. degree in Business Administration.

### **Maura Dunn, Chief Operating Officer, KBR, Inc.**

As COO for KBR's Infrastructure Americas region, Maura oversees the operations and marketing of projects, including design and construction of airport facilities, highways and environmental facilities. Prior to joining KBR, Maura was employed with the Virginia Department of Corrections where she was involved in the master planning and construction of nearly \$1 billion of correctional facilities. She received her MBA from Averett College and a B.A. degree in Political Science from the University of Richmond.

### **Rick J. Volk, Vice President, Koch Performance Roads, Inc.**

Rick is responsible for the successful implementation and completion of the STAR Solutions I-81 Project pavement design, construction, quality program and warranty. His role will be to ensure the team has the appropriate resources to complete the project to the satisfaction of VDOT. Rick is a civil engineer and attorney with more than 20 years experience in the transportation industry. He has recent experience with PPTA projects and has pioneered the use of innovative procurement processes and composite materials in civil infrastructure applications. Rick has managed toll facilities and is a former director of IBTTA, the leading international toll association.

### **Doug Dalton, President, English Construction Company, Inc.**

With more than 30 years experience on roadway projects, Doug provides direction and oversight for the operations of English Construction Company. He has a B.S. degree in Economics from Randolph-Macon College and serves as a member of the board of directors for the Virginia Road & Transportation Builders Association.

### **Charles Perry, Senior Vice President, Board of Directors, Wilbur Smith Associates**

Charles is a civil engineer with more than 30 years of experience in all aspects of planning, design and construction of major civil works projects, including roadways, bridges, commuter rail stations and other transportation projects. Charles previously spent 18 years with VDOT, holding numerous positions, including Assistant State Construction Engineer, District Engineer for the Northern Virginia District and Chesterfield Resident Engineer. He also spent five years as Vice President of Engineering with a construction company that performed total site construction, including highways, parking facilities, drainage and utilities.

### **Kenneth Taylor, Vice President, W-L Construction & Paving, Inc.**

Ken oversees the entire operation of the company, including all quarries, grading, estimating and paving operation. He has been with the company for more than 20 years. His undergraduate degree is in civil engineering technology and he has more than 30 years of experience in roadway construction, design and testing.

## 1.b Team and Key Principals' Experience

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Other key individuals who will provide experienced leadership on this project include:

### **Randolph L. DeLay, Chairman and CEO, Public/Private Strategies Consult, Inc.**

Randy specializes in strategic planning and public private partnerships. He has more than 30 years of experience in the fields of law, business management and governmental affairs. Randy has initiated and deployed numerous federal, multi-state and bi-national civil infrastructure projects, including the Border/Corridor funding program in TEA-21 and the I-69 eight-state Trade Corridor Initiative.

### **Thomas Bradshaw, Managing Director, Manager of Transportation Finance Group, Salomon Smith Barney**

Tom has senior-managed transportation financings for an extensive list of transportation issuers, including the Arizona Transportation Board, Alabama and Montana Highway Departments, Indiana and Virginia Departments of Transportation, Dallas Area Rapid Transit, Los Angeles County Transportation Commission, New York Metropolitan Transportation Authority, Orange County Transportation Corridor Agencies, Contra Costa County Transportation Authority, San Bernardino Transportation Authority, and San Diego Transportation Commission.

He has also negotiated turnpike financings for Florida, Illinois, Kentucky, Massachusetts, New Hampshire, New Jersey, Oklahoma, Texas, and Harris County, Texas. Tom is currently a member of the Southern Growth Policy Board and the American Road and Transportation Builders Association. Prior to beginning a career as an investment banker, he served as Secretary of Transportation for North Carolina from 1977 to 1981.

### **Tim Wilschetz, Senior Vice President of Transportation and Project Finance, Lehman Brothers**

Tim has 18 years of experience in infrastructure finance and development, including arranging the financing for a wide variety of transportation-related facilities. His recent experience includes structuring financing for new highway projects such as the Coalfields Expressway in Southwest Virginia, and the Camino Colombia Toll Road near Laredo, Texas, as well as working (along with team member Salomon Smith Barney) to finance the Texas Turnpike Authority's \$3.2 billion Central Texas Turnpike Project.

Tim also works with established agencies such as the North Texas Tollway Authority and New York State Thruway Authority to finance their ongoing capital needs. In 1999, he was instrumental in securing Lehman Brothers' position as guaranteed lender to allow the Washington Metropolitan Area Transit Authority to close on the first-ever federal TIFIA standby loan guarantee. Tim is a registered professional engineer and spent seven years with a major international engineering/development firm. He received his undergraduate degree from Purdue University and his MBA with honors from Columbia University.

## 1.b Team and Key Principals' Experience

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### **James W. Atwell, President, Commonwealth Service Company**

Jim will assist in the financial program portion of this project. Recognized nationally for his leadership in innovative approaches in financing transportation infrastructure, he was awarded the Leadership Award from the National Council for Public-Private Partnerships for having helped Virginia develop partnership systems that have become models for other states as well as the federal government. A graduate of the University of Richmond with a B.S. degree in accounting and finance, Jim has served on numerous national task forces on accounting, audit and finance as they affect transportation policy and has spoken to national conferences on the subject of transportation finance.

### **Ron Tillett, Managing Director, Morgan Keegan**

Ron is a Managing Director in Morgan Keegan's Richmond office. Prior to joining Morgan Keegan, he served four Virginia governors and the Virginia General Assembly over a 24-year public service career. As Secretary of Finance under two Virginia governors, he directed the activities of the State Comptroller, State Budget Director, State Internal Auditor, State Tax Commissioner, and the State Treasurer. He was responsible for advising the governors in the formulation and execution of the Commonwealth's fiscal policies. He served as chairman of the Commonwealth's Debt Capacity Advisory Committee and the Governor's Advisory Board of Economists. As State Treasurer under two former Virginia governors, Ron was responsible for the management and issuance of the Commonwealth's debt and as Chairman of the Treasury Board, and provided oversight of the Commonwealth's investments and banking services.

Prior to joining the executive branch of government in 1987, Ron spent 10 years with the Virginia General Assembly's House Appropriations Committee and Joint Legislative Audit and Review Commission. He received a B.S. in Urban and Regional Planning from Virginia Commonwealth University and holds the NASD Series 7 - General Securities Representative Professional License.

### **Chris Lloyd, Senior Vice President and Director of Business Expansion Services, McGuireWoods Consulting LLC**

Chris specializes in incentives negotiations, financing programs and contact with state agencies. He has significant expertise in the development of PPTA proposals and in assisting companies proposing PPTA projects with government and community relations activities. Chris served previously in the Office of the Secretary of Commerce and Trade where he was responsible for legislative, budgetary and regulatory coordination and development for 15 state agencies.

### **Frank Atkinson, Chairman, McGuireWoods Consulting LLC**

Frank's practice focuses on state and local government relations, economic development, privatization and public-private partnerships, education, and elections and voting rights. He served in the cabinet of former Virginia Governor George Allen as Counselor and Director of Policy. He participated in the development of the PPTA and its initial implementation.

## 1.b Team and Key Principals' Experience

*Describe the recent relevant experience of each entity identified above and the key principals involved in the proposed project. Describe the length of time in business, business experience, public sector experience and other engagements of the entity. The lead organization must be identified.*

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### **Abraham "Frank" Abugattas, P. E., Manager of Highways and Bridges, KBR**

In more than 40 years of providing engineering services, Frank has overseen the planning and design of highways, steel and concrete bridges, steel sheet pile cellular cofferdams, multi-story and industrial buildings, foundations, water resource projects, airports, heliports, water pipelines, and municipal projects. He is responsible for project management and supervision of professional and technical personnel for planning, development of design criteria, and preliminary and final design. Recent notable projects include the Dulles Greenway Tollroad, I-5/SR 22/SR 57 Interchange Reconstruction and the North Central Expressway, as well as global tollway and transportation projects. .

### **Jimmy Mills, Special Projects Leader, Wilbur Smith Associates**

Jimmy recently retired from a career at VDOT, where he progressed to positions of Assistant State Construction Engineer and State Location and Design Engineer. His experience gained in these positions provides him with significant expertise in the planning, design and construction of VDOT projects. Jimmy will use his experience to identify the resources needed for the project's success and to ensure that these resources are used most efficiently.

### **Jamie Browder, Regional Vice President, Wilbur Smith Associates**

Jamie has more than 30 years of experience in all aspects of planning, design and construction of major civil works projects, including highways, bridges, commuter rail stations and other transportation projects. Jamie leads a staff of about 90 engineers, planners, technicians and administrative staff in the Mid-Atlantic region. Major projects of his career include I-295 between Route 60 and I-64, Richmond District and the Woodrow Wilson Bridge Project. He is the former chief engineer of VDOT.

### **Daniel Papiernik, Vice President, Southeast Region Operations, TransCore**

Daniel has more than 15 years of experience with systems integration and intelligent transportation systems, including large-scale, complex application development and operations. He is responsible for overseeing TransCore's operations, including maintenance and technical support for several toll road facilities participating in Virginia's Smart Tag program (the Dulles Greenway, the Dulles Toll Road, Coleman Bridge, Powhite Parkway Extension and the Chesapeake Expressway) as well as the Southern Connector. Major projects of his career include design and upgrade of the Maryland Accident Records and Retrieval System (MARRS), initial development of the VDOT Enterprise Data Warehouse, technical consulting to the Washington Council of Governments, VDOT Smart Travel/ATS program and the Virginia Technical Transportation Institute.



**Al Volpe, I-81 Project Manager, KBR, Inc.**

Al has more than 30 years of on-site project management experience, including major international and domestic infrastructure projects with an emphasis on project management, project engineering, and construction management. He is experienced in contract management and construction management activities, field engineering, project estimating, project controls, and direct interface and coordination with engineering, procurement, construction groups and client management. He is currently serving as Project Manager for the \$620 million design-build Alice Springs-Darwin Railway project — an 880-mile track railway that completes the link in Australia’s national rail network by connecting the southern states with the north of Australia.

**1.c Contact Information**

*Provide the names, addresses and phone numbers of persons within the entity who may be contacted for further information.*

For further information regarding the organizational structure of STAR Solutions or specific information regarding this submittal, please contact:

James W. Atwell  
President  
Commonwealth Service Company  
2108 West Laburnum Ave., Suite 210  
Richmond, VA 23227  
Office: 804.340.0205  
Fax: 804.377.2301  
Email: jatwellcsc@aol.com

**1.d Client References**

*Include the address, telephone number and the name of a specific contact person for which the entity or primary members of the entity have completed a similar project.*

Our success with developing the right project team to deliver complex projects is best verified by contacting our customers. We encourage you to discuss our performance with the references listed below.

<b>APAC, Inc.</b>	
<p><b>Virginia Route 288 (PPTA)</b> Mr. Tom Hawthorne, P.E. Richmond District Engineer Virginia Department of Transportation 2430 Pine Forest Drive Colonial Heights, VA 23834 804.524.6000</p>	<p><b>Georgia 400</b> Mr. David Graham, PE State Construction Engineer Georgia Department of Transportation #2 Capitol Square, S.W. Atlanta, GA 30334 404.656.5306</p>
<b>Adams Construction Company</b>	
<p><b>Christiansburg- Blacksburg Bypass</b> Mr. J.D. Brugh Resident Engineer, Christiansburg Virginia Department of Transportation P.O. Box 420 Christiansburg, VA 24073 540.381.7200</p>	<p><b>Christiansburg-Blacksburg Bypass</b> Mr. Fred C. Altizer, Jr. District Administrator Virginia Department of Transportation P.O. Box 3071 Salem VA 24153 540.387.5320</p>



**1.d Client References**

*Include the address, telephone number and the name of a specific contact person for which the entity or primary members of the entity have completed a similar project.*

<b>English Construction Company, Inc.</b>	
<p><b><i>I-85 Bracey Rest Area/Welcome Center</i></b> Ms. Cyndi Ward Asset Management Division Virginia Department of Transportation 1221 East Broad Street Richmond, VA 23219 804.692.0390</p>	<p><b><i>Route 895 Connector (Pocahontas Parkway)</i></b> Mr. Dave Wesson VDOT Transportation Engineer Senior Virginia Department of Transportation 620 Moorefield Park Drive, Suite 210 Richmond, VA 23236 804.330.5200</p>
<b>KBR, Inc.</b>	
<p><b><i>Dulles Greenway Toll Road</i></b> Mr. Michael Crane Chairman Toll Road Investors Partnership 109 Carpenter Drive, Suite 200 Sterling, VA 20164 703.707.8870</p>	<p><b><i>U.S. North Central Expressway</i></b> Mr. Gary W. Taylor, PE Special Projects Engineer Texas Department of Transportation 9700 East R.L. Thornton Freeway, P.O. Box 3067 Dallas, TX 75221-3067 214.320.4432</p>
<b>Koch Performance Roads, Inc.</b>	
<p><b><i>Virginia Route 288 (PPTA)</i></b> Mr. Tom Hawthorne, P.E. Richmond District Engineer Virginia Department of Transportation 2430 Pine Forest Drive Colonial Heights, VA 23834 804.524.6000</p>	<p><b><i>New Mexico State Road 44 (Now US Route 550)</i></b> Mr. Max Valerio New Mexico State Highway &amp; Transportation Department P.O. Box 1149 Santa Fe, NM 87504-1149 505.827.5270</p>
<b>W-L Construction &amp; Paving, Inc.</b>	
<p><b><i>Route 19, Russell County</i></b> Mr. Roger Garrett, Project Engineer Virginia Department of Transportation P.O. Box 127 Lebanon, VA 24266-0127 276.889.3131</p>	<p><b><i>Route 72, Scott County</i></b> Mr. Jim Gates Virginia Department of Transportation P.O. Box 704 Jonesville, VA 24263-1913 272.346.1911</p>
<b>Wilbur Smith Associates</b>	
<p><b><i>I-95 Atlee-Elmont Interchange Bridges</i></b> Mr. Bruce Shepard Virginia Department of Transportation Richmond, VA 804.786.3016</p>	<p><b><i>I-81 Reconstruction, Rockbridge County</i></b> Mr. Steven H. Garrett Virginia Department of Transportation Richmond, VA 804.371.2956</p>

## 1.e Financial Statement

***Provide a financial statement of the private entity and each of its major partners, firms, or other businesses. Submit the most recent Securities and Exchange Commission 10-K and 10-Q reports, if such reports have been filed.***

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Please see the latest Security and Exchange Commission reports that follow for KBR and APAC, the two publicly-held companies of the STAR Solutions team as well as for Wilbur Smith Associates, an Employee Stock Ownership Plan company. Financial information for the privately-held companies of STAR Solutions, which includes Adams Construction Company, English Construction Company, Koch Performance Roads, and W-L Construction & Paving are included in Tab 3, which is being treated as confidential and proprietary as granted by VDOT as being exempt from all Freedom of Information Act requests.

## 1.f Bonding/Financial Assurances

***Provide necessary bonding/financial assurances.***

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As the project requires, STAR Solutions will provide, through its team members, the necessary bonding and financial security that may be required by VDOT to give assurances as to the payment to and performance during the construction phase of the project. Each contractor will bond its share of the construction work directly with VDOT or other appropriate entity.

## 1.g DBE Participation

***Include any planned participation of DBEs during project development and implementation.***

---

STAR Solutions is committed to actively seek out, support and encourage meaningful participation from disadvantaged business enterprises who add value to our team and to VDOT. With a broad base of Virginia subcontractors, our team can quickly award contracts to support its work in the design, project management support, construction and maintenance fields to fully qualified, responsive and responsible firms. We will meet or exceed VDOT's proposed goal of 12 percent DBE participation.

Our approach to performing the I-81 project is to:

- Use DBE subcontractors to provide equipment, personnel and resources, with primary emphasis on using Virginia subcontractors to maximize the project's impact on the local economy.
- Use Virginia DBE subcontractors to minimize the number of outside personnel to be brought to work on the project throughout the corridor
- Use DBE subcontractors to supply the maximum quantities of permanent materials, e.g., sand, aggregate, cement, reinforcing steel, concrete barriers, etc., to minimize costs and transportation equipment maintenance costs.

**To ensure our success for maximizing DBE involvement, we have added a Diversity Advocate specialist to our team.** Max Guggenheimer of English Construction Company brings more than 30 years of experience in working with minority and disadvantaged businesses. He has created mentor protégé programs for DBEs with the City of Richmond and the North Carolina Department of Transportation to encourage the development of small contractors' interest and ability to bid and construct transportation projects. In this position, Max will actively seek opportunities to increase the volume of business placed with qualified DBEs and provide guidance and counsel to these firms enabling them to qualify as suppliers of goods and services on a competitive basis.

## 1.g DBE Participation

*Include any planned participation of DBEs during project development and implementation.*

### DBE Action Plan

To further encourage DBE participation, our policy will be to assist in the development of qualified subcontractors and suppliers — including those listed on VDOT’s Certified Listing of Minority Business Enterprises — from such businesses offering goods and services on a competitive basis. We will strive to meet this commitment by:

- Identifying DBEs offering goods and services needed by STAR Solutions.
- Providing technical assistance and counsel to such businesses, enabling them to qualify as suppliers of goods and services on a competitive basis.
- Actively seeking to increase the volume of business placed with qualified DBEs so that they may become self-sustaining members of the economic mainstream.

We plan to use subcontractors not only for actual construction work, but also for engineering design, management support and construction support services. These services could range from surveying and signage design to computer and telecommunications support to general construction, signs and striping. STAR Solutions has already initiated meetings with several local DBE firms who have expressed an interest in this project and portray a strong history of performance.

We will continue to meet with other potential DBE teaming partners and commit to their meaningful participation throughout the project. The following is a partial listing of DBE firms we have already contacted for participation in project development and implementation:

Athavale, Lystad & Associates	Civil, Structural & Drainage
CHI Associates, Inc.	Roadway, Bridge, Hydraulics, CEI
BEL-STAR, Inc.	Cost Estimating, Schedules, CEI
NXL Construction Company, Inc.	Surveying, CEI
Saeed Associates, Chartered	Roadway, Structures
Legion Design Campbell & Associates	Roadway Design
RAJAN MAHIMA Associates, Inc.	Roadway, Bridges
Mary Ann Mijares Engineering, P.C.	Drainage Design
A.I.A. Engineers	Civil, Structural

Using local- and Virginia-based DBE firms with resident work forces will minimize the impact to the local area with respect to having to provide accommodations and support for the construction and other work forces.



## Tab 2 Project Characteristics

Because this section is not a complete update of the Phase One Conceptual Proposal, we have included the matrix below to indicate where the various items of the evaluation criteria are addressed in the Phase Three Detailed Proposal.

Evaluation Criteria Versus Proposal Location Matrix		Conceptual Proposal	Detailed Proposal
Tab 2	Project Characteristics		
2.a	Project Description	2-1	Tabs A - D, F- J
2.b	Work Performed by VDOT	2-12	
2.c	Federal, State and Local Permits	2-12	Tab K
2.d	Social, Economic and Environmental Impacts	2-14	Tab V
2.e	Critical Factors for Project Success	2-16	Tabs K, M & N
2.f.	Proposed Schedule	2-18	Tab L
2.g	Risk, Liability and Timely Completion	2-19	Tab U
2.h	Ownership, Legal Liability, Law Enforcement and Operation	2-19	
2.i	Phased Openings	2-20	Tab L
2.j	Policies and Procedures	2-20	Tab N
2.k	Traffic Control Issues and Solutions	2-21	



## **Tab 3 Project Financing**

This confidential information is contained in a separate binder.

## Tab 4 Public Support

### 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

The widening of I-81 and other related improvements along the entire 325-mile corridor in the Commonwealth will have numerous benefits, including enhanced safety, less congestion and new economic development opportunities. Further, the development of the STAR Solutions' I-81 Project more than satisfies the VDOT's long-range vision for improvements in the corridor. Instead of just applying a "Band-Aid" to the problems along I-81, we have proposed a comprehensive solution to address the long-term needs to address traffic growth in the corridor. Allowing the project to be developed under the PPTA also provides a number of benefits to the taxpayers of Virginia. Finally, reduced congestion offers environmental benefits.

#### **Safety and Congestion Issues Addressed**

Perhaps the single most important aspect of STAR Solutions' proposal is the improvement to driver safety that will result from separating heavy trucks and passenger vehicles. I-81 is widely recognized as one of the most dangerous transportation corridors in the Commonwealth, and possibly the nation. According to VDOT statistics, in the first four months of 2002 there were 694 accidents on I-81 in Virginia, with 352 people injured and 12 people killed. These accidents involved a total of 228 heavy trucks. On certain segments of I-81, the traffic fatality rate is double that of the rest of the Commonwealth. Headlines such as "Big Rig Crashes, Killing 1 and Tying up I-81 Traffic" (*Roanoke Times*, April 25, 2001) and "Thursday Wreck on I-81 Takes a 3rd Life; 14 Deaths in 4 Years on That 5-Mile Span" (*Roanoke Times*, Nov. 24, 2001) appear all too frequently.

*The addition of new capacity throughout the corridor will reduce the need to divert traffic onto local roads to avoid accidents on I-81, a nearly daily occurrence that causes severe bottlenecks on roads not designed to handle such volumes.*

The anticipated growth in traffic over the next 20 years, particularly of trucks, will only worsen the situation. Already, areas around Roanoke, Lexington, Staunton and Winchester are seeing truck volumes exceed 30 percent of daily trips. There are even times when truck traffic routinely exceeds 40 percent. Since the road was designed to handle just 15 percent truck traffic, this creates serious safety and maintenance problems. Further, since truck traffic is growing at a faster rate than car traffic, the problem is only getting worse. With the new restrictions on air cargo since September 11, truck volume on I-81 is growing even more quickly than anticipated just a few years ago. Tens of thousands of people rely on I-81 to get to work, to go to church, to go shopping or to go to school, yet many times when they get on the road, they encounter extremely hazardous road conditions exacerbated by the truck traffic volumes. Without immediate improvements, many segments of the interstate and the interchanges will reach Level of Service F (stop-and-go waves, poor travel times, low comfort and convenience, and increased accident exposure) in the next 10 years. As a result, I-81's status as an efficient freight corridor would be compromised and economic development in the area could falter.

## 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

The most comprehensive analysis of the safety issues on I-81 was a report released on March 28, 2000 by Virginia Congressmen Goodlatte, Wolf and Boucher. The I-81 Safety Task Force, chaired by former Secretary of the Army John O. Marsh, undertook a year-long analysis of issues such as engineering, redesign, construction, law enforcement, signage, incident management and truck equipment and operation safety. During four public hearings, the task force heard from residents and business leaders along the corridor who identified the desperate situation along I-81. While the task force did not make any formal recommendations, a number of steps, including separation of trucks and cars into different lanes and improved ITS, were closely examined as a way to resolve many of the safety and congestion problems.

As outlined in the recommendations of the Governor's Commission on Transportation Policy, quantitative data about safety should be the top criteria evaluated when VDOT determines its priorities for road construction or enhancement projects. Because of the current safety statistics, few highways in Virginia have more of a demonstrated need for improvements than I-81.

*Increased revenue results from avoiding idling and diversions since shippers often attach a dollar value to predictability and speed.*

### Benefits to Trucking Industry

Enhanced safety and reduced congestion have significant economic benefits, particularly to truck operators who depend upon their vehicles for their livelihoods. Although some trucking firms explain that they are paid by the load and not for timely deliveries, the ability to deliver more loads in a shorter amount of time because of reduced congestion and improved road conditions will certainly enhance their revenues. Moreover, the shift by many manufacturers and distribution companies to just-in-time delivery methods requires timely deliveries of products. In some cases, fines are levied against trucking firms when products are late. Savings in non-scheduled delays are valued at almost twice the amount of anticipated delays, and more businesses are locating their facilities near the best roads to ensure timeliness and consistency in their deliveries, as well as to help prevent damage of goods in transit. Our team also believes that many of the ITS components of the plan can also aid the trucking industry.

An issue that has been raised by opponents of truck tolls is a suggestion that truckers will divert from I-81 onto smaller local roads to avoid paying tolls. The reality for truckers is that diverting from I-81 does not lead to the most practical or efficient route. To travel the distance from Route 29 at the North Carolina border up to Route 15 North at Gainesville, Virginia, a driver would have to travel a 212-mile stretch that has at least 55 traffic signals and 418 bus stops, and at least 10 locations where the speed limit is below 55 miles per hour. Overall, using 40 miles per hour as an average running speed and counting one minute for bus stops, the trip from North Carolina to Warrenton would take approximately 5.3 hours, and then it could take several additional hours to maneuver through northern Virginia traffic to cross the Potomac River. This is an inefficient way to get through Virginia in lieu of using I-81. Further, traffic delays cost trucking companies at least \$146 to \$192 per hour, (Source: "DOT Study Finds Trucks Increasing Share of Freight", *Transport Topics*, October 7, 2002), so reducing them by increasing capacity on I-81 will result in cost savings to trucking firms.

## 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

Trucking logistics specialists say that often it is cheaper to take the toll road than to avoid it because out-of-route miles can add significantly to the variable costs of running a route. Carriers have three different types of operating costs: running costs (fuel, maintenance, and tires), variable costs (all the costs incurred for off-route miles), and fully loaded costs (typical costs for all miles, including overhead and equipment). If a carrier only incurs running costs (typically the lowest costs), the lower the toll, the greater the number of miles a carrier can travel off-route. However, if the driver is compensated for those miles (part of the variable costs), the number of miles a carrier can travel off-route decreases significantly.

There is also little evidence to show that tolls affect truckers' routes or the volume of truck traffic. On the Ohio Turnpike, where the toll cost was increased each year from 1995-1999, nearly 750,000 more trucks are using the road now than before the tolls were increased. On the New Jersey Turnpike, the toll was increased in 2000, but the number of truck trips increased by nearly 1.1 million trucks in 2001. Another study done by the Florida Department of Transportation showed that convenience (i.e., the shortest route/distance between the points of origin and destination) was the major consideration of routing. Florida even attempted to change truck routing behaviors, but according to the *Palm Beach Post* (September 3, 2002), "In 1996, the state reduced tolls for truckers on Florida's turnpike to lure them from I-95 after a rash of crashes. The lower tolls, however, were not enough to make truckers go out of the way."

### **Economic Development Stimulus**

The reconstruction of I-81 will create a number of economic development opportunities throughout the corridor. The project will also have spin-off benefits for the entire state. Not only will the actual construction create thousands of new jobs for the entire construction period, but also by making the road safer and reducing congestion, the widening will make the region more attractive to new and expanding businesses. It is also anticipated that by making the road safer and reducing congestion, commerce along the corridor will be more efficient, thus resulting in significant savings to truckers and motorists.

The ongoing trend among firms looking to locate their distribution centers is to locate next to the best roads, and treat any associated tolls as a cost of doing business. Common thought amongst transportation-dependent companies is that spending money to drive on toll roads might save them from paying higher costs later on, due to higher gasoline costs and the risk of accidents on a more congested road. Distributors also value being able to take a less congested and well-maintained road to avoid damage to their freight in transit.

Most firms value locations near effective transportation facilities. There is plenty of evidence to support the increased economic growth adjacent to good transportation whether tolled or not. As an example, Illinois, which operates one of the country's most extensive toll highway networks, had the largest number of new and expanded truck facilities last year, according to *Site Selection* magazine.

The greater issue is that businesses want and are increasingly relying on consistent and timely transportation. Traffic congestion impacts freight networks and economic penalties are factored in for freight delays. The real opportunity is that improvements in this transportation corridor will provide a positive benefit to consistent, timely freight movement.

Economic benefits of the STAR Solutions I-81 Project are more fully detailed in Tab 5.b.

#### 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

##### **Schedule and Cost Savings for Taxpayers of Virginia**

Under conventional construction and funding mechanisms, the complete reconstruction of I-81 could take 30 to 40 years. In fact, the recent reduction in funding available in the Six-Year Improvement Plan could extend this date even further. STAR Solutions' proposal greatly accelerates this completion date and provides many benefits to the taxpayers of Virginia, including:

- **Shifting of risk from VDOT to STAR Solutions** - One of the most important benefits accruing directly from the PPTA process is that price and schedule risks as well as project coordination are shifted from VDOT to the project team. Although VDOT retains those responsibilities that are better retained in the public sector domain, including securing right-of-way, public safety law enforcement and facility ownership, costly risks of schedule, cost and performance are placed with the private sector. This allows the department to focus on other transportation priorities. Further, inflation risk is transferred from the state to the project team.
- **Financing plan allows resources to be used for other transportation needs** – The STAR Solutions' financing plan allows Virginia to realize almost immediately, the benefits of an improved I-81 corridor without delaying or harming other planned transportation projects in the Commonwealth. Further, today's historically low interest rates allow for the project to be built more affordably than ever.
- **Pavement rehabilitation and reconstruction agreement reduces future maintenance expense** – STAR Solutions' proposal to provide a pavement warranty for the project offers many benefits, particularly in helping to reduce future paving costs and disruptions to the corridor during repair and rehabilitation. By carefully monitoring the pavement performance and immediately addressing any problems that develop, the superior condition of the road is maintained.

*STAR Solutions' 20-year pavement warranty trims ongoing maintenance costs and minimizes disruptions to the corridor during repair and rehabilitation.*

General benefits of the pavement warranty include:

- Reduction in VDOT resources required for maintenance.
- Providing state-of-the-art pavement maintenance management on new pavement that may have positive overflow effects to other VDOT facilities
- Eliminating cost risk of future work.
- Enhancing performance for the end users.
- When funding obligations are met, the resulting facility will be performing at a high level of service and quality.

For these reasons, the warranty should also be viewed as a significant contribution of equity to the project by the STAR Solutions team.

## 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

- **Faster delivery** – Our financial program allows I-81 reconstruction to be complete in less than half the time as compared to conventional methods. The STAR Solutions' proposed concept under the PPTA will enhance the value obtained by taxpayers by combining the best advantages obtained in the public and private sectors. This proposal provides a method of accountability for transportation cost, scheduling and quality that leverage skills and knowledge of both groups.
- **Comprehensive solution** – The STAR Solutions' plan offers a comprehensive, forward-thinking approach to solve the problems along all 325 miles of I-81 in Virginia instead of just making spot improvements. Although a comprehensive approach may appear more costly, the need is there now to make improvements in the entire corridor, and VDOT should embrace a visionary approach to dealing with the problems in the corridor that could save money in the long term.

### Consistent with VDOT Plans

STAR Solutions' proposal is consistent with the VDOT plan for improvements to the I-81 corridor. In 1998, VDOT commissioned the "I-81 Improvement Study Project," which divided the corridor into 10 study areas for a comprehensive examination of the current conditions along the road and made recommendations for improvements. That project resulted in the recommendation to widen the entire interstate to three lanes in each direction and called for additional lanes where warranted by traffic volumes or other conditions. The study also noted, however, that there was no funding available to implement its recommendations. This project takes that recommendation to the next level. By creating at least two new lanes of capacity in each direction, by separating heavy truck and light truck/passenger vehicle traffic, and developing a viable financing plan, many of the problems identified in the I-81 Improvement Study Project are resolved.

I-81's emergence as a major commercial corridor, particularly as an alternative to I-95 and I-85, is the cause of many of the safety and congestion delays now becoming evident. Because there are no viable alternate routes to I-81 — either other corridors outside Virginia or local roads — traffic congestion and safety problems will only worsen without these improvements. Enhancing the highway will not only deliver benefits to the citizens of Virginia, but also improve the efficiency and speed of commerce throughout the entire region.

The STAR Solutions team has also worked hard over the course of the past year to ensure that the team's plans are compatible with local needs and plans. In fact, as a result of meeting with every affected local jurisdiction in the corridor, we have assembled a list of I-81 corridor priorities, including additional interchanges or other related improvements that these communities would like to see emerge from the reconstruction project. We look forward to working with VDOT during the PPTA evaluation process to include many of these recommended enhancements that support economic development, tourism, and other local goals.

We have also reviewed much of the industry literature and research regarding separated truck lanes, and we believe those materials provide further support for our proposal, including recent reports by the Commonwealth Transportation Research Council. These reports include:

*"The Effect of Speed, Flow, and Geometric Characteristics on Crash Rates for Different Types of Virginia Highways"* – January 2000, Virginia Transportation Research Council, Neal Garber and Angela Ehrhart

#### 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

*"A Simulation Analysis of Traffic Flow Elements For Restricted Trucks Lanes on Interstate Highways in Virginia"* – Virginia Transportation Research Council, Lester Noel and Jennifer Peek

*"Exclusive Lanes For Trucks and Passenger Vehicles on Interstate Highways in Virginia: An Economic Evaluation."* – Virginia Transportation Research Council, Lester Noel and Joseph Vidunas

*"Estimating the Supply and Demand for Commercial Heavy Truck Parking on Interstate Highways"* - Virginia Transportation Research Council, Garber, N.J., Wang, H. and Charoenphol, D.

That research demonstrates the safety and congestion relief of such a plan as well as the potential for economic savings through increased efficiency of freight movements, lower fuel costs and insurance savings. In fact, during the course of the past years, we have been contacted by a number of organizations interested in our proposal and even students at Virginia Tech doing graduate research on the concept.

VDOT has also expressed growing concern regarding deficient bridges in the I-81 corridor. Many of these structures, some of which are nearly 40 years old, need significant repairs or rehabilitation. Our improvements plan helps to address these critical safety problems.

#### **Environmental Benefits**

By reducing congestion, and thus the time that people spend idling in their cars because of accidents and other traffic problems, the STAR Solutions' I-81 Project achieves environmental benefits. Cars and trucks emit tons of exhaust even while sitting in traffic, so by reducing these occurrences through increased capacity, pollution is reduced to levels less than would otherwise exist given the growing traffic volumes.

#### **Multi-State Coordination on I-81 Improvements**

During the course of the past year, members of the STAR Solutions team have been consulting with senior transportation officials with other states in the I-81 corridor to learn more about their existing improvements plans, educate them about the PPTA process and the new VDOT solicitation for I-81 improvements, and to establish a network of contacts with whom we can coordinate efforts to ensure the maximum efficiency of freight and car movements throughout the corridor. These efforts are in addition to those by VDOT that were detailed at the Harrisonburg pre-proposal conference. What should be noted, however, is that these states have needs less than I-81 because of the availability of alternate parallel routes or other interstates that allow traffic to move east-west from I-81 to major destinations such as Philadelphia via I-76, Nashville via I-40, and Washington/Baltimore via I-70. Therefore, their improvement plans are not to the scale of what is needed in Virginia.

As a result of these meetings, we have learned about activities in the following states:

**West Virginia** – The state is in the process of widening I-81 to three lanes in each direction from Martinsburg to the Maryland state line. Construction should be finished in the near future. Because of severe right-of-way restrictions in the corridor and other funding constraints, no additional improvements are planned at this time.

#### 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

According to WDOT officials, other projects, such as the King Coal Highway, Corridor H, bridges across the Ohio River, and the Coalfields Expressway are a higher priority at this time.

**Maryland** – MDOT has begun the NEPA process for the addition of a third lane to I-81 from the West Virginia line to I-70 to relieve existing congestion issues. With regard to rail improvements in the I-81 corridor, Maryland is willing to coordinate efforts with the Commonwealth, but they have expressed to us no desire to move forward on a specific project on their own that would require state funding because the case has not been made to them that rail upgrades will sufficiently reduce freight movements on the interstate to justify the expense.

**Pennsylvania** – PENNDOT officials have begun studying plans for adding an additional lane in each direction.

**Tennessee** – In addition to examining upgrades to I-81, Tennessee is undertaking a significant examination of freight movements in the I-40 and I-81 corridors to determine if rail upgrades could reduce traffic congestion. The estimated cost of such a project is \$1.2 billion. The estimated fare for a train passenger would be \$0.15 per mile plus a \$5 surcharge per ticket.

Because of these contacts, the STAR Solutions team is uniquely positioned to begin the I-81 widening project in Virginia immediately and to assist VDOT in coordinating matters with other states.

#### **Metropolitan Planning Organizations**

There are currently two metropolitan planning organizations (MPOs) in the I-81 corridor — the Roanoke Valley Area Metropolitan Planning Organization and the Bristol Urban Area Metropolitan Planning Organization. As a result of the 2000 census, three additional MPOs are in the process of being created in the Winchester area, in the Harrisonburg/Staunton area, and in the Blacksburg/Christiansburg area. The STAR Solutions team has worked to establish contact with each of these organizations. Team members have made presentations to the Northern Shenandoah Valley Regional Commission (from which the Winchester MPO will emerge) and the Central Shenandoah Valley Planning District Commission (from which the Harrisonburg/Staunton MPO will emerge) to discuss our plans for widening and improving I-81. Mr. Wayne Strickland from the Roanoke Valley Area Metropolitan Planning Organization also participated in a STAR Solutions' briefing for City of Roanoke and Roanoke Regional Chamber of Commerce officials in December 2001. We have also spoken to Mr. Dave Rundgren of the New River Valley Planning District Commission about the group's plans.

The three new MPOs have just begun their organizational meetings and we will work with VDOT to coordinate our efforts to inform them about the revised I-81 improvements proposal. As a result of the contacts we have made with local government officials throughout the I-81 corridor, many of whom will serve on the MPOs when constituted, we believe that we have a distinct advantage in having them understand what we are planning and to establish a partnership for moving the project forward at the appropriate time.

#### **Statewide Multi-Modal Long-Range Transportation Plan**

The STAR Solutions team is committed to ensuring our improvements plan complements the Statewide Multi-modal Long-Range Transportation Plan that is now being updated for completion in 2005. As required by the VDOT RFP for I-81, and as outlined in Tab 2, we have identified a

#### 4.a Community Benefits

*Identify who will benefit from the project, how they will benefit and how the project will benefit the overall transportation system.*

number of ways to improve multi-modal access throughout the corridor and be forward thinking in addressing the problems of the corridor instead of only adding more asphalt. While the problems of the corridor do require significant increases in road capacity, we believe multi-modal solutions can provide some relief.

#### 4.b Government and Community Support

*Identify any anticipated government support or opposition, or general public support or opposition for the project.*

##### **Government Support**

Because of the well-documented need for improvements to I-81 to enhance safety, reduce congestion and create economic development opportunities, there is widespread government support for a project of this type. This support has manifested itself in a number of ways over the past four years:

**Six Year Transportation Program (FY 04-09)** – The Commonwealth Transportation Board has recently adopted the new six-year plan that allocates \$37 million to begin the environmental work for I-81 improvements. Such analysis will be vital in helping to determine which improvements, if any, are necessary to relieve congestion on I-81.

**Virginia Transportation Act of 2000** - Because of the pressing safety issues on I-81, the VTA provided \$75 million to the Salem and Staunton districts to make immediate safety improvements along the corridor. This funding was in addition to the new money to accelerate other I-81 projects provided by the VTA.

**Interstate 81 Safety Task Force** - As previously detailed in Tab 4.a of this proposal, this group undertook a year-long examination of the safety concerns of citizens along the entire corridor. The task force's report served as a vehicle for advancing various suggestions to improve the current situation, including widening of the road and the separation of trucks and cars.

**Interstate 81 Study Project** - VDOT's effort in 1998 to comprehensively examine the challenges of I-81 and make recommendations for its improvement is one of the most visible demonstrations by the state that the highway should be reconstructed. It forms a basis for extending the design to four lanes in each direction.

**Interstate 81/Interstate 77 Overlap Study** - Based on findings from the widening studies, the Commonwealth Transportation Board included \$2.5 million in the 1999-2000 Six-Year Improvement Program to fund a comprehensive location study to develop alternatives to alleviate congestion on the I-81/ I-77 overlap, which was determined to be the top priority for I-81 improvements in the Bristol transportation district. That study is now underway under the leadership of Hayes, Seay, Mattern & Mattern, one of the STAR Solutions' team members.

**Roanoke Regional Mayors and Chairs Forum** – At the first-ever meeting of the mayors and boards of supervisors chairmen of the Roanoke region convened by Roanoke mayor Ralph Smith in 2001, the widening of I-81 was identified as the area's top priority.

*Originally built for 15 percent truck traffic, I-81 averages 30-40 percent trucks daily. Numerous government studies and task forces support the need for immediate improvements to I-81.*

## 4.b Government and Community Support

*Identify any anticipated government support or opposition, or general public support or opposition for the project.*

**Executive and legislative commissions** - Numerous executive and legislative branch commissions in recent years, including the Governor's Commission on Transportation Policy and the Commission on the Future of Transportation in Virginia (HJR 843 - 1999), have heard testimony on and actively discussed the need for immediate improvements to I-81. There have also been several recent attempts by legislators to create commissions solely focused on I-81 issues.

**SJR 55 (2000) Study of Diversion to Rail** - Completed by the Virginia Department of Rail and Public Transportation, this study analyzed the viability of upgrading the existing freight rail tracks running parallel to much of the I-81 corridor to divert some cargo shipments from the highway to rail. While the study concluded that consideration of public investment in rail improvements along the I-81 corridor is warranted, it was anticipated that such an investment could divert no more than 10 percent of the anticipated growth of truck traffic from the road, a very nominal amount.

**House Bill 1373 (2002)** - During the 2002 General Assembly session, the legislature was asked to consider an amendment to the PPTA statute to permit consideration of the STAR Solutions' proposal. That legislation was adopted with overwhelming support, and upon signing House Bill 1373, Governor Warner noted that "Anyone who drives I-81 knows the sooner this road is widened and car and truck traffic is separated, the safer all motorists will be. This is an innovative approach to enhancing our state transportation system and protecting our citizens who drive on I-81." This policy was reaffirmed by the 2003 General Assembly when legislation to repeal the tolling provisions was withdrawn by the sponsor.

**SMART Travel Reports** - Many of the ITS components of the STAR Solutions' proposal build directly upon the findings and recommendations of VDOT in its various SMART Travel reports, including the plan developed for the portions of I-81 in the Staunton district. Those reports clearly recognized the many benefits of ITS in helping to reduce congestion and improve accident response. The STAR Solutions' proposal builds on that work by integrating ITS with local, regional, and state public safety activities that will enhance security and emergency response.

*Widening I-81 to four lanes in either direction will ease safety concerns regarding co-mingling passenger and heavy truck traffic.*

**Virginia Transportation Research Council** - The group recently released a report that outlines the lack of truck parking in the I-81 corridor. The report noted that the deficiency of spaces is likely to be 1,193 by 2010 and 1,463 by 2020. The STAR Solutions proposal is the only one that helps to address this problem through the construction of at least 1,200 new truck parking spaces at median rest areas.

**Comments by VDOT officials** - Since January 2003, VDOT staff have been asked to appear at a variety of local events to detail the competing proposals for improvements to I-81. Most of these comments have been supportive of improvements. For example, it was reported by the *Northern Virginia Daily* that at a meeting of the Woodstock Rotary, Staunton District Administrator Dennis Morrison noted that "I-81's other problems include inadequate shoulders, exits too close together, and a sub-base under the pavement that is wearing thin because it just wasn't designed to carry that much traffic."

## 4.b Government and Community Support

*Identify any anticipated government support or opposition, or general public support or opposition for the project.*

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### **Local Government Activities**

The support for I-81 improvements has only been enhanced as a direct result of the work of the STAR Solutions team since its initial proposal was unveiled last year. Representatives of the team have met with government officials in every jurisdiction in the I-81 corridor, and they have conducted numerous briefings of various boards of supervisors, planning district commissions and other governmental organizations. These efforts have resulted in a number of resolutions of support for improvements to the I-81 corridor through public-private partnerships, including the City of Salem, the City of Harrisonburg, Shenandoah County, and the Northern Shenandoah Valley Regional Commission. Many of these localities have also expressed an interest in the evaluation of moving freight from I-81 to rail, and our proposal addresses that issue. Other localities have expressed support for I-81 improvements and the STAR Solutions' concept but have decided not to take official action to avoid any perception of favoritism when competition exists.

Since January 2003, all of the local governments in the I-81 corridor have been approached by rail advocates, including a group known as Residents for Indiscriminate Development, seeking their support for resolutions calling for additional rail in the region. According to press reports, such resolutions have been adopted by Salem, the City of Roanoke, Roanoke County and Frederick County.

In addition, representatives of SMART Solutions have solicited resolutions from local governments opposing truck tolls. We are not aware of any such resolutions being passed in their original form by affected local jurisdictions; however, the Rockingham County Board of Supervisors did adopt a resolution calling on more fairness in how highway funds are allocated statewide and that such allocations should be used to reduce the need for tolls.

### **Government Opposition**

Several local governments outside the I-81 corridor, including Henry County, Carroll County, Pittsylvania County, the City of Martinsville, and the Town of Rocky Mount, have adopted resolutions opposing truck tolls on I-81 because of unsubstantiated claims that such tolls would either significantly increase truck traffic through their communities or threaten funding for their transportation priorities. No locality that would be an "affected local jurisdiction" under the provisions of the PPTA statute has opposed tolls on trucks, I-81 improvements, or the STAR Solutions' proposal. The Lynchburg Metropolitan Planning Organization has also asked staff to study the potential impact of I-81 corridor tolls on usage of U.S. Route 29.

### **Public Support**

Public support for I-81 widening greatly outweighs the opposition and has been documented in a number of ways as well as further affirmed through research and analysis conducted by a reputable third-party consultant. STAR Solutions, as part of its proposal preparation process, also conducted public opinion research to directly determine whether people in the I-81 corridor support widening. Our analysis had the following results:

- 91 percent think it is important to widen I-81 to four lanes (with 58 percent citing safety as the top reason to widen the highway)
- 92 percent of residents want the road improved in 15 years or less

## 4.b Government and Community Support

*Identify any anticipated government support or opposition, or general public support or opposition for the project.*

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While the amount of public support for widening and improving I-81 is not surprising among residents of the I-81 corridor, our polling shows remarkable support for the project and the financing plan among trucking households as well. An estimated 19.3 percent of the people surveyed classified themselves as "working in the trucking industry or for a business that relies on the trucking industry." Among these people, support for separating cars and trucks and widening I-81 enjoyed nearly the same approval rating — 89.6 percent — as it does among the general population. Support for those improvements to happen in 15 years or less is even higher than among the general households — 96.1 percent. Clearly, people in the trucking industry realize the importance about doing something to improve the conditions on I-81 soon. Approximately 62.3 percent even supported requiring large trucks to pay a toll to cover the cost of improvements. Over three-quarters of trucking households, even more than in the general population, believe that even with the toll, the area will become more attractive for economic development.

During the past two years, the STAR Solutions team has worked hard to detail the benefits of the team's proposal and to encourage public dialogue regarding the project. These efforts have included establishment of a website — [www.improve81.com](http://www.improve81.com) — that solicits public comment regarding the project. The depth of support for the project is reflected in some of the following statements:

*"...I believe this is the only viable solution to our regional transport issues."*

D.K., Winchester

*"I would emphatically support the separation of cars and trucks on I-81. I myself have been involved in an incident that was caused by a truck...th(e) entire incident would not have happened if trucks were in separate lanes. Luckily no one was hurt and the truck company paid for the damages, but this is another case that shows that the volume of truck traffic on the highway has exceeded safe allowable. Thank you for your efforts to protect the motorists that travel on this dangerous stretch of highway."*

C.N., Newport News

*"I agree that we should impose a toll on truckers using the proposed new lanes on I81. Those who use the road should pay for it!"*

E.C., Waynesboro

*"I believe the plans are outstanding...This is a much needed project that should not only alleviate the immediate problems but would also make the interstate prepared for the future. I think it is about time that the toll is instituted on this type of project to defray the costs. It is, quite frankly, a common sense approach and I would be glad to pay a toll to make the conditions of the highway safer and more commuter friendly. Thanks for all of the hard work including having to endure with all of the opponents to the project...I know I am merely one in this project but please move forward with my blessings."*

D.D., Eagle Rock

## 4.b Government and Community Support

*Identify any anticipated government support or opposition, or general public support or opposition for the project.*

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*"...WE NEED IMPROVEMENTS TO I-81 NOW..."*

G.E., Harrisonburg

*"Your team should be commended for its proposal and your ability to come forward with an idea/plan to relieve the congestion and make a very dangerous roadway, safer---Something must be done ASAP to make the lifeline of Western Virginia a safe place for all to travel---... For us who travel I-81 each day in both directions it is obviously getting busier all the time---Thanks for the effort so far..."*

D.S., Christiansburg

**VDOT Customer Satisfaction Survey** - Completed in October 2001 by the Center for Survey Research at the University of Virginia, this comprehensive assessment of how Virginians view VDOT provides support for I-81 widening. In addition to answering specific questions about VDOT performance and activities, respondents were asked to offer suggestions for improvements. In all three VDOT districts covering I-81 (Salem, Staunton and Bristol), a number of people identified widening of roads, alleviating truck-generated congestion and better road upkeep as top priorities. Citizen comments about I-81 ranged from "I-81 needs a lot of work" to "the truck traffic is very bad" to "I-81 is terrible."

**New Century Region Analysis** - In 2000, the Center for Community Research at Roanoke College conducted a sample of 130 leaders in the New Century Region (Roanoke metropolitan area) to solicit their input on the most pressing issues facing the area. A full 89 percent of the respondents indicated that widening of I-81 should be a top priority for the region.

**I-81 Improvements Project Study** - In addition to the preliminary engineering and design performed for VDOT as part of this process, public hearings were held along the entire corridor to solicit opinions about the proposed improvements plan. A review of the written public comments shows some isolated concerns about the impact on specific properties, but generally, there was widespread support for the widening plan.

**Interstate 81/Interstate 77 Overlap Study** - Similarly, public involvement has been a vital part of this study. At the public information hearing on October 29, 2001 to review the study's preliminary results, nearly 250 people attended to hear the recommendations.

**Roanoke Regional Chamber of Commerce Transportation Summit (2001)** - Speakers and panelists at the event identified the widening of I-81 as the top transportation priority for the region, noting that even if the various rail improvements become necessary, I-81 should be widened to at least three lanes in each direction.

**Corridor Chambers of Commerce** - Members of the STAR Solutions team have met with chamber of commerce and economic development officials throughout the corridor to brief them on the proposal. Many organizations, including the Lexington-Rockbridge County Chamber of Commerce, the Harrisonburg-Rockingham County Chamber of Commerce, and the Roanoke Regional Chamber of Commerce have endorsed I-81 improvements as a result of these meetings.

## 4.b Government and Community Support

*Identify any anticipated government support or opposition, or general public support or opposition for the project.*

**Community forums and meetings** - Numerous forums and meetings have been held during the past several years in communities along I-81 to discuss the problems with I-81. Citizens' concern about safety and congestion along I-81 has been made known all along the corridor. Our team members have addressed dozens of civic groups along the corridor with audiences totaling more than 1,000 members, interested in seeing improvements to I-81. These groups include the Wytheville Lions Club, the Salem Rotary, the Washington County Rotary, the Augusta Lions Club, the Roanoke Civitan, the Marion Rotary, the Abingdon Kiwanis, and many others. Our team has also made presentations of trucking interests, including the Shenandoah Travel Club, the Northern Shenandoah Valley Manufacturers Association, and the Virginia Manufacturers Association, to encourage dialogue regarding the proposal.

**Litigation** - The problems with safety and congestion along I-81 resulted in a lawsuit that was filed in 2001 seeking to declare a segment of I-81 a public nuisance.

In addition to these opportunities for public support for the project, various news outlets have expressed their editorial opinions about the project. These include:

*Staunton News Leader*, January 23, 2003 – “Whatever VDOT does, we hope that there will be a detailed analysis made of the future viability of any plan. While a faster, cheaper solution might prove a short-term fix, a 5-year solution that takes 10 years to build and is outdated by the time it’s completed won’t benefit anyone. I-81’s congestion problems didn’t evolve overnight...”

*Winchester Star*, January 21, 2003 – “Time is definitely of the essence here, as the state, so noted Mr. Shucet on Monday, does not have 30 years to wait on such an initiative. With these latter sentiments we wholeheartedly concur, given the fact that a road built to handle no more than 15 percent truck traffic now regularly sees this percentage rise to 40 percent on certain days and nights.”

*Bristol Herald Courier*, January 22, 2003 – “For years, it’s been common knowledge among lawmakers and transportation officials that I-81 was operating at close to – or even above – capacity. In 2001, Ray Pethtel, a former VDOT Commissioner, warned that by 2020, when the entire I-81 project was supposed to be complete, the highway would once again be obsolete.”

### **Public Opposition**

Several organizations, mostly outside the corridor, have adopted resolutions opposing truck tolls on I-81, again, largely based on unsubstantiated information regarding truck diversions to local roads and potential impacts on other transportation projects. These include the Alleghany Highlands Chamber of Commerce, the Dan River Industry Roundtable, the Greater Augusta Regional Chamber of Commerce, and the Martinsville-Henry County Chamber of Commerce. Several additional groups, including the Virginia Poultry Association, the Virginia Forestry Association, and the Virginia Manufacturers Association have expressed their opposition to truck-only tolls. The STAR Solutions team has held meetings with many of these groups to develop ways to address this concern and to detail the many benefits of our proposal.

## 4.b Government and Community Support

*Identify any anticipated government support or opposition, or general public support or opposition for the project.*

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Further, industry advocates were encouraged to submit recommendations for safety improvements and operational enhancements to the STAR Solutions team. Many of those recommendations have been incorporated into our new design as reflected in Tab 2.

**SMART Solutions** - As a direct result of the proposal to widen and improve I-81 using a toll on trucks, as required by Virginia law, a group of trucking companies and related interests has formed SMART Solutions. This group has indicated their support for I-81 improvements, but they oppose truck tolls to support it. No alternative funding mechanism has been offered by the group. SMART Solutions has tested a number of messages, ranging from truck diversion, to economic ruin for communities along the corridor, to I-81 draining funds for other transportation projects in the state, including I-73, in an effort to defeat the truck toll approach. Based on recent polling data, these efforts have had little or no impact. In fact, support for improvements to I-81 has increased over the past 12 months.

During the course of the past year, STAR Solutions team members have held a variety of meetings with members of the SMART Solutions coalition, including the Virginia Trucking Association and the American Trucking Association to foster a positive dialogue to address industry concerns.

SMART Solutions has also begun to coordinate its efforts with the Virginia Manufacturers Association to specifically oppose the STAR Solutions plan because of the truck toll financing mechanism. These groups have not endorsed a competing plan that relies on tolls on all vehicles, and various representatives have also expressed opposition to fuel tax increases to support needed improvements.

### **Environmental and Community Preservation Groups**

Nearly every transportation project in the country faces opposition from environmental and other preservation groups because of perceived impacts. Some environmental activists have argued that in lieu of widening I-81 to meet the anticipated growth in traffic, an all-rail solution should be embraced. While STAR Solutions supports rail improvements as outlined in Tab 2, we do not believe that rail can be the only modal solution for the problems on I-81. Fortunately, our polling has indicated that views of the environmental and preservation groups are not shared by the vast majority of residents along the I-81 corridor. In fact, most believe that improvements to I-81 will help the environment by reducing congestion and improving air quality.

In addition, representatives of the Shenandoah Valley Battlefields Foundation have, according to press reports, met with VDOT representatives to suggest that I-81 improvements be done in such a way as to minimize the impact on Civil War battlefields in the corridor, particularly those near Cedar Creek and New Market. Such analysis will be an important part of the NEPA process.

#### 4.c Public Involvement Plan

*Explain the strategy and plans that will be carried out to involve and inform any agency and the public in areas affected by the project.*

The success of the STAR Solutions' I-81 Project will depend upon full public involvement in each step of the project review, design and construction process. STAR Solutions also wants to be a full partner with VDOT in disseminating information to affected citizens and to build public support for this plan. To accomplish this, STAR Solutions will implement a comprehensive public involvement plan. Our vision is to keep people along the corridor fully informed every step of the way so that impacts are minimized and opportunities (employment, supply, contract participation) are maximized and ensure that it is designed in a way that addresses any site-specific needs. In fact, we have provided copies of this proposal not only to every affected local jurisdiction along the I-81 corridor, but also to every MPO/PDC and other interested parties, in an effort to improve communication about this project.

STAR Solutions intends to have an outreach strategy that actively works in the affected communities to proactively address concerns about the project and listen to public comments. The team will work closely with VDOT on media relations and help with technical briefings, site tours, news releases and other informational materials about the project.

*STAR Solutions has initiated a public involvement program to inform the public of the preliminary aspects of our project. Working with members of the local and regional press, we will build on this performance — via brochures, newsletters, website and meetings — to keep the public and all stakeholders informed.*

Every member of STAR Solutions has a long history of facilitating public comment and input on transportation projects in Virginia and across the U.S. By implementing a strategy consisting of our best practices learned through years of experience, our public involvement process will be both substantive and meaningful. As outlined in our proposed schedule, we envision beginning the public comment and hearing process as soon as possible.

The complex nature of the project also drives the public involvement plan. Many of the permits and approvals needed for this project, as outlined in Tab 2.c of this proposal, including the NEPA clearance process, have statutorily defined public input and comment processes associated with them. Further, the project will have to be added to the various regional transportation plans, including the Constrained Long-Range Plans of the Bristol and Roanoke areas metropolitan planning organizations, as well as the three new MPOs recently formed for Harrisonburg/Staunton, Winchester, and Christiansburg/Blacksburg. Getting those plans amended to include this project also requires public notice and hearings. STAR Solutions will establish a comprehensive communications program using the following tools to ensure maximum contact with the public and stakeholder groups:

- Public meetings
- Employment / contractor opportunity fairs
- Newsletters
- Web site
- Mail, e-mail and fax lists
- Media communications
- Public outreach

#### 4.c Public Involvement Plan

*Explain the strategy and plans that will be carried out to involve and inform any agency and the public in areas affected by the project.*

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Similar communications programs developed by STAR Solutions team members have been lauded for their proactive communication and effectiveness by previous clients, the driving public, and agencies on state, Federal, and international levels. VDOT will benefit by retaining first-hand knowledge, be able to coordinate other VDOT efforts effectively, and make use of team resources to manage information that showcases the benefits of this public-private partnership. In fact, we look to VDOT to be our full partner in these efforts and would work in full cooperation with the agency to keep citizens informed about the project.

## Tab 5 Project Benefit/Compatibility

### 5.a Public Benefits

*Describe the significant benefits to the community, region or state. Identify any state benefits resulting from the project, including the achievement of state transportation policies or other state goals.*

I-81 is a vital link in both the Commonwealth's and the nation's transportation system. By linking the large consumer markets of the Northeast with the emerging manufacturing centers of the Southeast, this highway has become an important corridor in today's just-in-time delivery process. Further, its strategic location has made it the home of a number of warehouse and distribution centers, including those for *Fortune* 500 companies such as Target and Best Buy. In addition to its role in commerce, I-81 connects a number of tourist attractions of national significance, ranging from the Woodrow Wilson birthplace in Staunton to Shenandoah National Park. Annually, Shenandoah National Park hosts two million visitors.

The geography of the Shenandoah Valley, the Roanoke Valley, the New River Valley and other areas along the corridor, with mountains on both sides of the road, has turned I-81 into the "Main Street" for western Virginia. Many people living in this region must use the interstate to carry out their daily lives. It is a road that cannot be bypassed and there are few, if any, viable alternatives for residents or even for people just passing through. I-81 is the lifeline of western Virginia.

With the heightened accountability of VDOT to its constituencies in providing responsive action and an efficient transportation system, STAR Solutions will hold itself no less accountable to VDOT's high standards in delivering the I-81 improvements on time and on budget. In our continuing dialogues with I-81 community leaders, we have developed a vast body of knowledge of what the various communities need and expect in terms of linking their local transportation networks with I-81 and are taking those issues into consideration in our plans and designs. The result is that all affected communities will benefit in ways that are most effective for them wherever feasible.

*One of VDOT's core values is to provide safe and efficient movement of people and products throughout the state's transportation system. Our concept to separate heavy trucks and passengers along the I-81 corridor supports VDOT in achieving this important goal.*

STAR Solutions' I-81 Project offers numerous benefits, with enhanced safety being the most significant aspect. Expanding I-81 from two to four lanes in each direction is a plan for the future. Greater capacity addresses the anticipated growth in traffic volumes. Separating trucks from cars reduces the potential for accidents. Tackling the construction in several large phases, instead of multiple incremental steps, helps to reduce work zone accidents. Finally, by relieving congestion, travel time savings occur. This makes the road more efficient and attractive to residents, tourists and business owners. The following paragraphs detail some of the major public benefits of STAR Solutions' proposal.

## 5.a Public Benefits

*Describe the significant benefits to the community, region or state. Identify any state benefits resulting from the project, including the achievement of state transportation policies or other state goals.*

### **Maintenance of the Integrity of the Interstate Highway System**

As one of the oldest interstates in the country, and one built primarily to connect small rural cities, I-81 was not designed to address the traffic it now carries. Traffic jams are frequent around Roanoke and other cities along the route. Truck traffic at certain interchanges causes huge backups. Ramps not designed to handle large truck volumes are the site of numerous truck accidents. Accidents along the narrow and rolling route are frequent, and delays of four to five hours are common. Because of these accidents, traffic is diverted onto Route 11 or other local roads, conflicting with pedestrians, school buses, emergency vehicles and other local traffic.

The STAR Solutions' I-81 Project addresses all these problems. By adding much needed capacity to I-81 and separating trucks from cars, the most pressing safety and congestion problems are resolved. Creating truck-only interchanges will also produce safety improvements and reduce congestion. Our plan for tolling heavy trucks by "boothless" electronic means will avoid problems associated with tollbooths. All of this results in maintaining the integrity of the interstate highway system – a top priority for both the federal and state transportation agencies.

### **Reduction of Accidents and Congestion**

Safety problems abound on all of I-81 in Virginia, but some stretches have a particularly tragic accident rate. The five-mile section near the Arcadia exit in Botetourt County has been the scene of 14 fatalities in the past four years. The stretch of I-81 from Rockbridge to Wytheville saw 10 deaths in 2001.

*"Wreck on I-81 claims the life of W&L senior. The death marked the 11<sup>th</sup> this year on the stretch of Interstate 81 between Wythe County and Rockbridge County."  
December 3, 2002, Roanoke Times.*

The STAR Solutions' I-81 Project will help resolve many of the problems that now cause

accidents on I-81. No road can be made accident-free, but by separating heavy trucks and passenger vehicles and implementing intelligent transportation systems technology and other safety improvements, lives can be saved.

### **Consistent With VDOT Improvement Plan**

As previously outlined in Tab 4, this project is consistent with the recommendations for improving I-81 made in the VDOT studies completed in 1998. In fact, this plan goes one step further. Not only is additional capacity created, but safety is greatly enhanced.

Further, this plan helps to fulfill the vision for improvements to I-81 that was a part of the Virginia Transportation Act of 2000. That statute provides \$75 million for immediate safety improvements along the corridor, a down payment on the eventual upgrade of the entire road.

VDOT's decision in August 2002 to issue a solicitation for PPTA proposals for the I-81 project signals the agency's interest in immediately resolving the problems associated with I-81. Unfortunately, declining state and federal revenues mean that a traditional solution is unlikely. That is why STAR Solutions has developed an innovative finance and construction plan to deliver the needed improvements now.

## 5.a Public Benefits

*Describe the significant benefits to the community, region or state. Identify any state benefits resulting from the project, including the achievement of state transportation policies or other state goals.*

### **Consistent With Local Jurisdiction Improvement Needs**

During the STAR Solutions' meetings with city and county officials, significant discussions were held concerning the respective access needs of the communities and how construction on I-81 may impact them, particularly along the major cities, existing interchanges and any planned future local construction. STAR Solutions has taken those local transportation needs into consideration to not only minimize impacts to local traffic flow but to complement the future plans of adjacent transportation facilities, such as the configurations of collector-distributor roads, overpasses and number of sound walls.

### **Funding Plan Addresses Long-Term Needs**

By relying on the existing sources of transportation funding in Virginia, the residents along I-81 would have to wait a long time before seeing the kind of transportation improvements needed to make this highway safe again. The need for transportation funds in the Commonwealth is great, and other pressing projects, such as the Woodrow Wilson Bridge, widening of I-64 on the Peninsula, the completion of the Mixing Bowl and the Third Crossing, are placing significant strains on the existing funding streams. Further, the failure of the recent transportation referenda will place further pressure on existing revenue sources to support transportation projects. Without a dedicated source of funding, I-81, despite the great need, will only receive spot improvements. In fact, the recent revisions to the Six-Year Improvement Plan further reduced the amount of funding available for those limited projects.

*The STAR Solutions' innovative funding plan represents an opportunity to provide immediate safety enhancements along I-81 without stretching VDOT's ability to simultaneously fund other regional transportation priorities.*

Our finance program solves this dilemma and allows for safety enhancements to be made almost immediately along the entire route. After reaching a comprehensive agreement with STAR Solutions, construction of improvements such as truck climbing lanes, longer on- and off-ramps and other enhancements could begin.

Further, our funding plan, along with the 20-year pavement reconstruction and rehabilitation agreement, provides a way to continue to maintain this asset as it is built. This not only helps to preserve the road, but may also improve safety.

## 5.b Economic Benefits

*Describe significant benefits to the state's economic condition. Discuss whether this project is critical to attracting or maintaining competitive industries and businesses to the state or region.*

A project of this magnitude will have a significant and dramatic impact on the economy of the region and the entire Commonwealth. While much of the region has enjoyed the economic prosperity of the past decade, pockets of unemployment still exist. Not only will the construction of the road itself create tens of thousands of new jobs, but it will open up new tourism and

## 5.b Economic Benefits

*Describe significant benefits to the state's economic condition. Discuss whether this project is critical to attracting or maintaining competitive industries and businesses to the state or region.*

economic development opportunities along the entire corridor. As previously outlined in Tab 4, reducing congestion and improving safety also has direct economic benefits to commuters and truckers along the route.

### **Economic Impact of I-81 Widening**

An American Road & Transportation Builders Association report released in 1999 shows that every \$1 billion invested in highway construction results in \$2.05 billion of economic activity and supports 34,400 new jobs. The STAR Solutions' I-81 Project is expected to create many thousands of construction jobs and spin-off jobs in the corridor and across the state.

While unemployment is not a problem in some jurisdictions along I-81, there are pockets of joblessness where such an economic boost will be welcome.

Localities such as Bristol, Pulaski County, Radford, Smyth County, Washington County and Wythe County all have unemployment rates far higher than the state average. Other jurisdictions near the highway, such as Dickenson County, Henry County and the City of Martinsville have some of the highest unemployment rates in the nation. The new jobs that will be created will provide opportunities to thousands in Virginia.

*Completion of the I-81 project would result in more reliable cargo shipment that will enhance economic development already underway in the region and attract new businesses and jobs.*

### **Economic Development**

During the past eight years, economic development activities have flourished in the I-81 corridor, bringing thousands of new job opportunities and millions of dollars of new investments. Over the past two years, companies such as Bristol Compressors, V&S Bristol Galvanizing, Bristol Brass, Northwood Manufacturing, Maple Leaf Bakery, Hershey Foods, Echostar, McKee Foods, SYSCO Foods, Pepsi Bottling, U.S. Foodservice, Wal-Mart, Universal Companies, AFG, Klockner-Pentaplast, Marvin Windows and Doors, Home Depot, and Heat Transfer Specialties have all announced significant new facilities or expansions. In fact, a number of these expansions have occurred during the time that plans for placing tolls on I-81 have been publicly discussed. I-81 is also the home of Virginia's burgeoning automobile parts manufacturing sector.

Yet despite this economic growth, many of the industries along the corridor are facing tough times. Companies such as R.R. Donnelly, Norfolk Southern, Haleos, Kollmorgen, Optical Cable, Acterna and Internet have announced significant layoffs, driving unemployment rates higher in their host communities. The recent avian influenza epidemic cost farmers in the region more than \$100 million. The construction of I-81, and the employment opportunities it creates, will have a stabilizing effect on the economy of the entire region. By putting thousands of people to work over the entire construction period, residents will not only be able to weather the current economic downturn, but they will also have safe and reliable job opportunities for many years to come.

## 5.b Economic Benefits

*Describe significant benefits to the state's economic condition. Discuss whether this project is critical to attracting or maintaining competitive industries and businesses to the state or region.*

The STAR Solutions' I-81 Project also facilitates the generation of new economic development product along the corridor. The success of the New River Commerce Park in Pulaski County will be enhanced by this project. Further, the separation of I-81 and I-77 in Wytheville is expected to facilitate the construction of a new industrial park there. STAR Solutions will work closely with economic development and chamber of commerce officials throughout the region to ensure that they are fully informed about our project's activities so they can use this in developing new products and to enhance their marketing efforts. Much of the I-81 corridor is also part of Virginia's Technology Corridor as designated by the General Assembly. If VDOT selects the option to install fiber optic cable along I-81, affected localities may attract new industries that rely heavily on information technology.

Further, it is our belief that improvements to I-81 — by improving safety and reducing congestion — will make the corridor even more attractive to additional economic development in the future. There is no documented evidence that tolls chase away business. In fact, just the opposite is true. Tolls often facilitate better roads, which lead to increased growth. Dana Kingsley, a dispatcher for Pepsi's Orlando distribution center told *Plants, Sites and Parks* magazine, "It's just as easy to have a truck running 65 mph down a toll road than go on [a surface road], going slower and spending more on gas and chance a congested accident."

During the past years, members of the STAR Solutions team have met with many of the local and regional economic development officials in the I-81 corridor, as well as briefed the staff of the Virginia Economic Development Partnership, regarding the proposal's many benefits. We plan to continue this inclusive process to keep people informed about the team's plans and to solicit ideas for additional ways to enhance economic development activities.

### **Tourism**

Tourism is an economic force along the I-81 corridor. In 1999, the latest year for which complete statistics are available, traveler spending in the counties along I-81 exceeded \$1.24 billion. That spending has been growing at nearly five percent each year. Tourism activities employ 17,422 people along I-81, thus many families have a direct connection to the industry. Making I-81 safer, more efficient and more accessible will only further boost tourism opportunities along the corridor.

The decision by the American Automobile Association (AAA) Mid-Atlantic to endorse the separation of cars and trucks along I-81 in February 2002 shows how important the STAR Solutions proposal is for tourism. Since millions of motorists rely on AAA for travel advice, their recommendations on routes have a significant impact on what attractions people visit. Many tourist officials in the I-81 corridor have been concerned that unless improvements are made soon, AAA would recommend that motorists avoid the route altogether. Such a recommendation would have a devastating impact on the tourism industry throughout western Virginia.

## 5.b Economic Benefits

*Describe significant benefits to the state's economic condition. Discuss whether this project is critical to attracting or maintaining competitive industries and businesses to the state or region.*

---

### **Accountability to VDOT and the Communities**

For the maximum economic development benefit to be achieved, the I-81 corridor communities must be kept abreast of project progress. Businesses wishing to locate or expand in the area need to have both current and projected project status to establish the potential impact to their business plans. Commuters, tourists and motorists passing through will also want the most current information as well in planning their drives. The STAR Solutions project management team will hold itself accountable to both VDOT and the I-81 communities by providing quarterly progress reports and continuous updates for VDOT and business and community leaders as appropriate. While VDOT is our customer in any comprehensive agreement, our ultimate customers are the people who use I-81, and we will continue our efforts to be responsive to their needs and accountable to their desire to see a safer and less congested road.

# Detailed Proposal Improvements to the I-81 Corridor

September 5, 2003

Submitted by STAR Solutions, a consortium of:

- APAC, Inc.
- Adams Construction Company
- English Construction Company, Inc.
- KBR, Inc.
- Koch Performance Roads, Inc.
- W-L Construction & Paving, Inc.
- Wilbur Smith Associates

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## Why STAR Solutions?

### TEAM WORK

- engineering, finance, project management and construction resources to get the job done and develop a model public-private partnership with VDOT

### INNOVATIVE FINANCING

- balanced and complete plan that includes user fees and federal and state funding, and does not burden taxpayers nor displace other transportation priorities

### KNOWLEDGE

- insight to Virginia roads experience as well as geographical and climatic conditions, and local contractors

### CAPABILITY

- successful past performance on complex interstate and highway projects throughout the Commonwealth

### LOCAL FOCUS

- significant local small business and subcontractor involvement

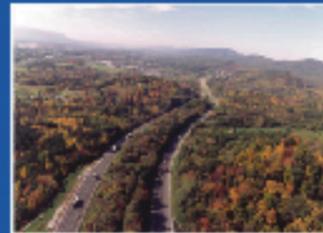
### RESPONSIVE DESIGN

- total solution for entire I-81 corridor that features an intermodal approach and a long-term pavement warranty

#### For more information, please contact:

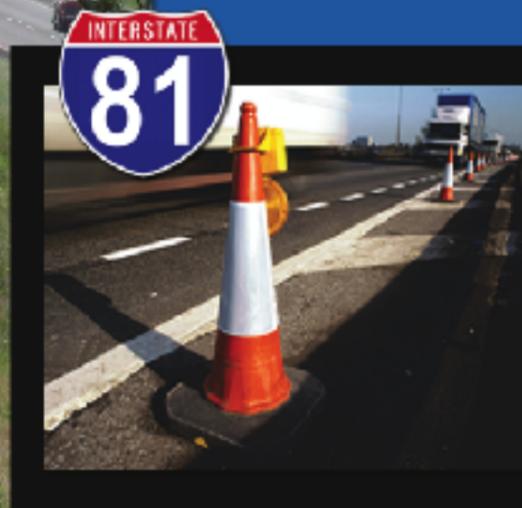
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## Executive Summary

*Safety first – no exceptions.*



*September 2003*



Baker, Transport, and Railways

*Working with VDOT to Make I-81 Safer for Everyone*



Baker, Transport, and Railways

KB R0003

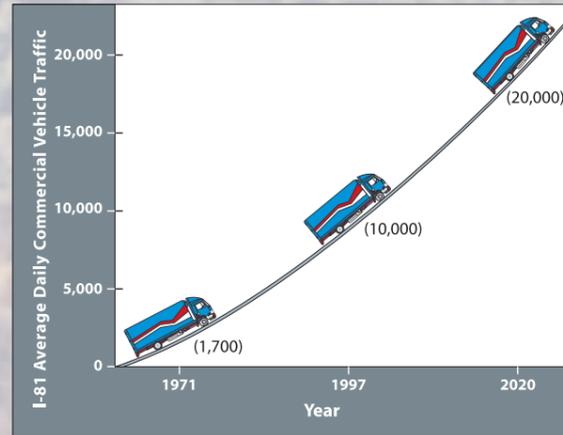
# SAFETY

# PARTNERING

# FINANCING

For the past two years, STAR Solutions has diligently worked on developing a sound design for improving the I-81 corridor that is centered on safety. Our design features:

-  At least four lanes in each direction, including dedicated commercial vehicle lanes and general purpose lanes
-  Significant reduction of trucks mixing with cars throughout the corridor
-  A plan for new rail and intermodal facilities
-  A high quality pavement that will reduce the number of future delays and lane closures for repairs
-  A 20-year pavement warranty for all mainline, collector-distributor lanes, ramps and shoulders
-  Roadway shoulders that meet FHWA requirements
-  Eliminating design exceptions on the existing highway
-  Six fully directional dual interchanges and eight truck-only flyovers
-  Minimizing environmental impact by reducing right-of-way needs, compared to previous proposal
-  Completion within 15 years.



STAR Solutions' innovative proposal seeks to address the long-term needs to increase capacity and improve safety throughout the I-81 corridor. It is not a short-term improvement, but instead a plan that is a true solution.

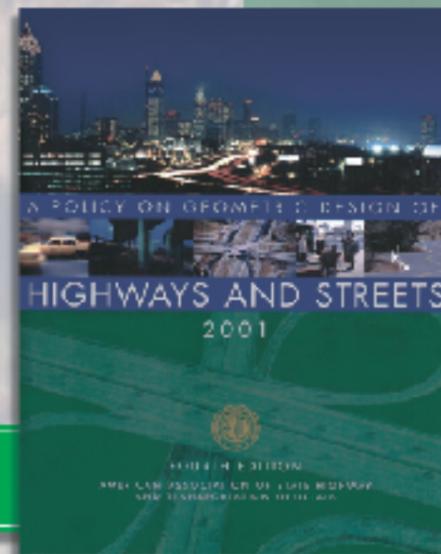
Improving 325 miles of interstate is an enormous undertaking. Our plan is expected to cost in the range of \$5.7 billion to \$6.3 billion in constant dollars, depending upon various options. The savings that will result from its implementation — improved safety, reduced congestion and economic benefits — make this a worthwhile investment.

Our plan is financed using a combination of federal and state funds, along with a toll on commercial trucks as currently permitted by Virginia law. The toll rate will be comparable to what trucks now pay to use other toll-funded highways in the U.S. Additional state funding or tolls on cars would allow for a reduced truck toll or additional optional improvements.

We have also put forth a creative plan to help move cargo to rail that is now moving by truck on I-81. Our rail finance plan calls for spending hundreds of millions of dollars to alleviate bottlenecks in the rail network that has the potential to remove between 560,000-1.4 million trucks each year from I-81, helping ensure the long-term sufficiency of our eight-lane plan for this highway corridor. These improvements will also help make additional passenger rail a reality. We support further study and analysis, along with coordinated efforts with neighboring states, to successfully implement this plan.

In addition, our road design facilitates other rail-related improvements in the future and has the ability to convert one of the truck lanes to railroad-type movements.

**Our goal is to give the people of western Virginia and all users of I-81, a safe and efficient corridor that is essential to address the anticipated increase in truck traffic.**



## Level of Service

## Meets Long-Term Needs



## Tab A Project Configuration

***A topographical map depicting the location of the proposed facilities in relation to the existing features, clearly identifying areas where widening will be in the median, areas requiring widening to the outside, the location and limits of any proposed toll facilities, the location of any proposed truck climbing lanes, and the configuration of any proposed interchange improvements. Also include a drawing indicating the typical section(s) of any proposed improvements.***

---

I-81 is the main transportation corridor and economic lifeline serving western Virginia, traversing from Bristol at the Tennessee border in the south, to the West Virginia border near Winchester in the north, a total of 325 miles. It is one of the eight most-traveled routes in the U.S. for commercial vehicle traffic. The artery has volume and weight loads that well surpass the highway's original design capacity for a maximum of 15 percent truck traffic, with truck volume varying between 30 and 40 percent in 2003.

Because the traffic has surpassed the original design, because it is a highly traveled route for commercial vehicle traffic and because of its importance as an economic transportation corridor, VDOT contracted a study of I-81 in the late 90s. The results of the study showed a need to widen the interstate and reconfigure the interchanges to address traffic projections for 2018. This study is the basis for STAR Solutions interchange configurations and sets the minimum right-of-way requirements for our proposal.

Figures A-1 through A-4, on the following pages, are maps depicting the areas of detail for the I-81 improvement project. Figure A-1 shows the statewide concept while figures A-2 through A-4 show the individual districts for Staunton, Salem and Bristol, respectively.

The following narrative and accompanying figures complement the topographic maps. This information summarizes STAR Solutions' conceptual design, highlights the assumptions made during the preparation of the scope of work and construction cost estimate, and outlines the methodology used by the team to arrive at the most cost-effective solution to reconstruct the corridor.

### **Three tables are included in this section:**

Figure A-5 lists all the existing and proposed bridge structures within the project and the action proposed by STAR Solutions for each structure. This proposed action includes demolition and replacement of the existing structure, construction of new structures, or retrofitting and replacing the existing structures. Figure A-5 does not include any existing or proposed culverts.

Figure A-6 lists all the existing and proposed interchanges along I-81. The table also shows the improvements proposed by STAR Solutions for each existing interchange as well as the location and the type of proposed new interchange. A pictorial legend demonstrating each of the proposed interchange designs is included with this figure.

Figure A-7 shows the number of lanes proposed by STAR Solutions along I-81 based on a conceptual Level of Service Study (LOS) completed by the team based on FHWA LOS requirements. Figure A-7 also shows the areas where widening needs to take place to provide the number of lanes indicated. These areas of widening could change as additional traffic studies and other additional information becomes available during a preliminary design to be completed after the Comprehensive Agreement is signed.

***A topographical map depicting the location of the proposed facilities in relation to the existing features, clearly identifying areas where widening will be in the median, areas requiring widening to the outside, the location and limits of any proposed toll facilities, the location of any proposed truck climbing lanes, and the configuration of any proposed interchange improvements. Also include a drawing indicating the typical section(s) of any proposed improvements.***

---

Below is a more detailed discussion of the information shown on each of the above-mentioned figures and a brief discussion of the assumptions made by STAR Solutions during the preparation of the construction cost estimate.

#### **Figure A-5: Existing and Proposed Bridge Structures**

The STAR Solutions' proposal includes demolition and replacement of 246 bridges, retrofitting and/or widening of 105 existing bridges, and construction of 38 new bridges. This list of proposed structures does not include the new bridges necessary to reconstruct the six full-service (separate ramps for commercial vehicles and cars) interchanges or construct the eight truck-only flyovers as shown in Figure A-6.

All new bridges will be designed in accordance with the current American Association of State Highway and Transportation Officials (AASHTO) guidelines and specifications as modified by VDOT. The typical section for these new bridges will be the same typical section of the highway carried by the structure. When applicable, the typical section will consider the need for pedestrian and non-vehicular traffic. The span arrangements and the length of the new structures will accommodate the number of lanes shown in Figure A-7 (LOS for 2025).

In addition to determining the geometric design of the new bridges and within the constraints of producing an economic bridge design, STAR Solutions will attempt to obtain early input from landscape architects as well as members of the community and civic clubs to determine the overall appearance of the bridges. Consistent with the aesthetic considerations and to minimize time and cost of construction, the team will use standard typical designs for similar bridges throughout the corridor.

Existing geotechnical information, supplemented with new investigations as needed, will be used to design the foundation of the new bridges and verify the foundation for bridges to be retrofitted or widened.

For bridges that are considered for retrofitting and/or widening, STAR Solutions will follow AASHTO and VDOT guidelines to perform a condition survey and a full inspection to investigate areas of distress or deterioration as well as chemical testing to assess concentration of chloride in the concrete deck (and beams in the case of concrete girder bridges). After completing this effort, the team will make an assessment of the economic feasibility of rehabilitation or replacement and propose a course of action to VDOT. The estimated cost of engineering and construction submitted at this time by STAR Solutions includes only widening of these 105 bridges.

#### **Figure A-6: Existing and Proposed Interchanges**

The STAR Solutions' proposal includes reconstruction and upgrading of 74 existing interchanges, construction of 4 new interchanges, reconstruction of 6 existing interchanges to allow for dual interchanges with full directional movements of trucks separated from general use vehicles, and construction of 8 truck-only flyovers along I-81 route. Location and interchange type as well as the proposed design for each interchange is shown in Figure A-6.

***A topographical map depicting the location of the proposed facilities in relation to the existing features, clearly identifying areas where widening will be in the median, areas requiring widening to the outside, the location and limits of any proposed toll facilities, the location of any proposed truck climbing lanes, and the configuration of any proposed interchange improvements. Also include a drawing indicating the typical section(s) of any proposed improvements.***

---

Reconstruction of the existing interchanges will include substantial geometric modification, additions of collector-distributor lanes, construction of new bridges (included in Figure A-5), and the addition of new traffic signals and installation of new illumination at appropriate interchanges.

At this time, STAR Solutions has not completed a final LOS for the proposed interchanges; therefore, our proposal is based on the configuration and number of ramp lanes shown in the I-81 study completed by VDOT in 1998. Once the LOS for all interchanges is completed and the final geometric design is finalized, the team and VDOT will adjust the estimates as necessary. When needed, the design of the interchanges will include efficient accommodation for pedestrians and non-vehicular traffic. The cost of these facilities has not been included in our estimate.

The six major multi-directional interchanges proposed by STAR Solutions will provide separate connectors and ramps for trucks and cars. In addition, the interchanges will be fully illuminated.

**Figure A-7: Proposed Number of Lanes and Location of Widening**

STAR Solutions has completed a preliminary study to assess the LOS of the main lanes in the I-81 corridor. This study was completed for the years 2025 and 2035. The STAR Solutions' proposal is based on the LOS for 2025. As previously mentioned in Figure A-5, the new over-crossings have been designed to accommodate the LOS Study for 2025.

Figure A-7 shows the number of lanes that have been used as the basis of estimate for the year 2025. The number of lanes is shown for each location along I-81. Also shown on the table are the locations where widening or reconstruction will be in the existing median or on the outside. These locations are based on our conceptual design and may change after the environmental documents is completed and additional topographic information is collected.

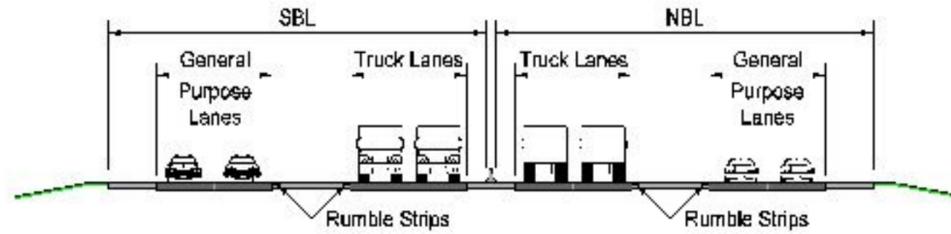
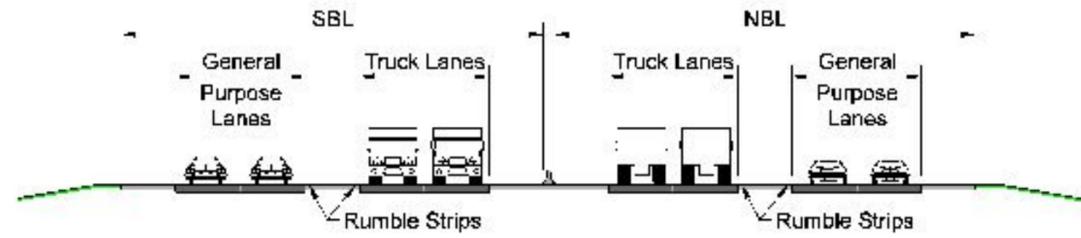


**Area of Detail**

**Key to Features**

- F Flyover
- Interchange to be Improved
- Dual Interchange (Separate Ramps for Cars and Trucks)
- New or Replacement Interchange
- Interchange to be Combined or Replaced
- Interchange - No Work Anticipated

\* Denotes Half-Flyover at Beginning and End of Project



Median Truck Rest Area and Toll Registration Plaza

End Project State Line

**Staunton District**

Median Truck Rest Area

Median Truck Rest Area

**Salem District**

Median Truck Rest Area

See Bristol District Map

Median Truck Rest Area and Toll Registration Plaza

Begin Project Approx. Mile 8.5

**Bristol District**

**Design Concept Statewide**



*Working with VDOT to Make I-81 Safer for Everyone*

**Figure A - 1**

Map Not to Scale

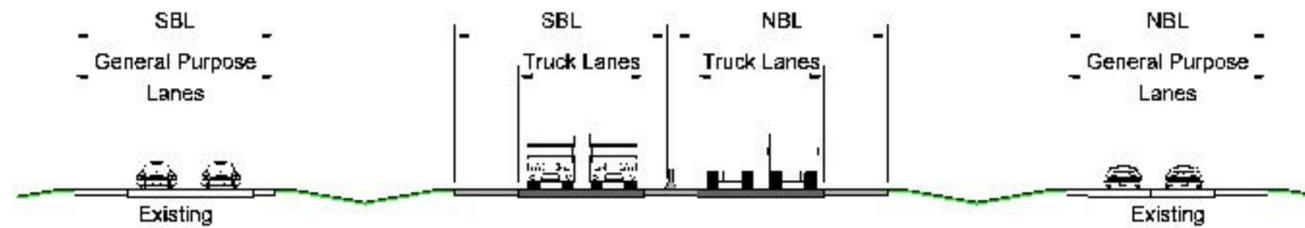


**Area of Detail**

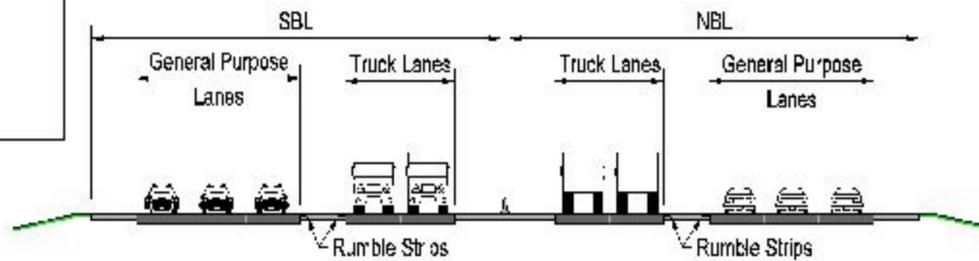
**Key to Features**

- Flyover
- Interchange to be Improved
- Dual Interchange (Separate Ramps for Cars and Trucks)
- New or Replacement Interchange
- Interchange to be Combined or Replaced
- Interchange - No Work Anticipated

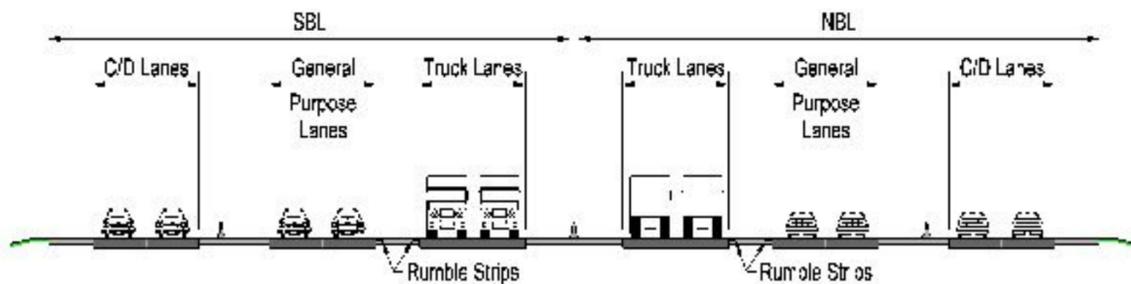
\* Denotes Half-Flyover at Beginning and End of Project



**Typical Section Existing Wide Medians**  
(i.e., Mount Jackson Area)



**Typical Section With 3 General Purpose Lanes**  
Winchester and Harrisonburg Areas



**Typical Section With Collector/Distributor (C/D) Lanes**  
Staunton Area

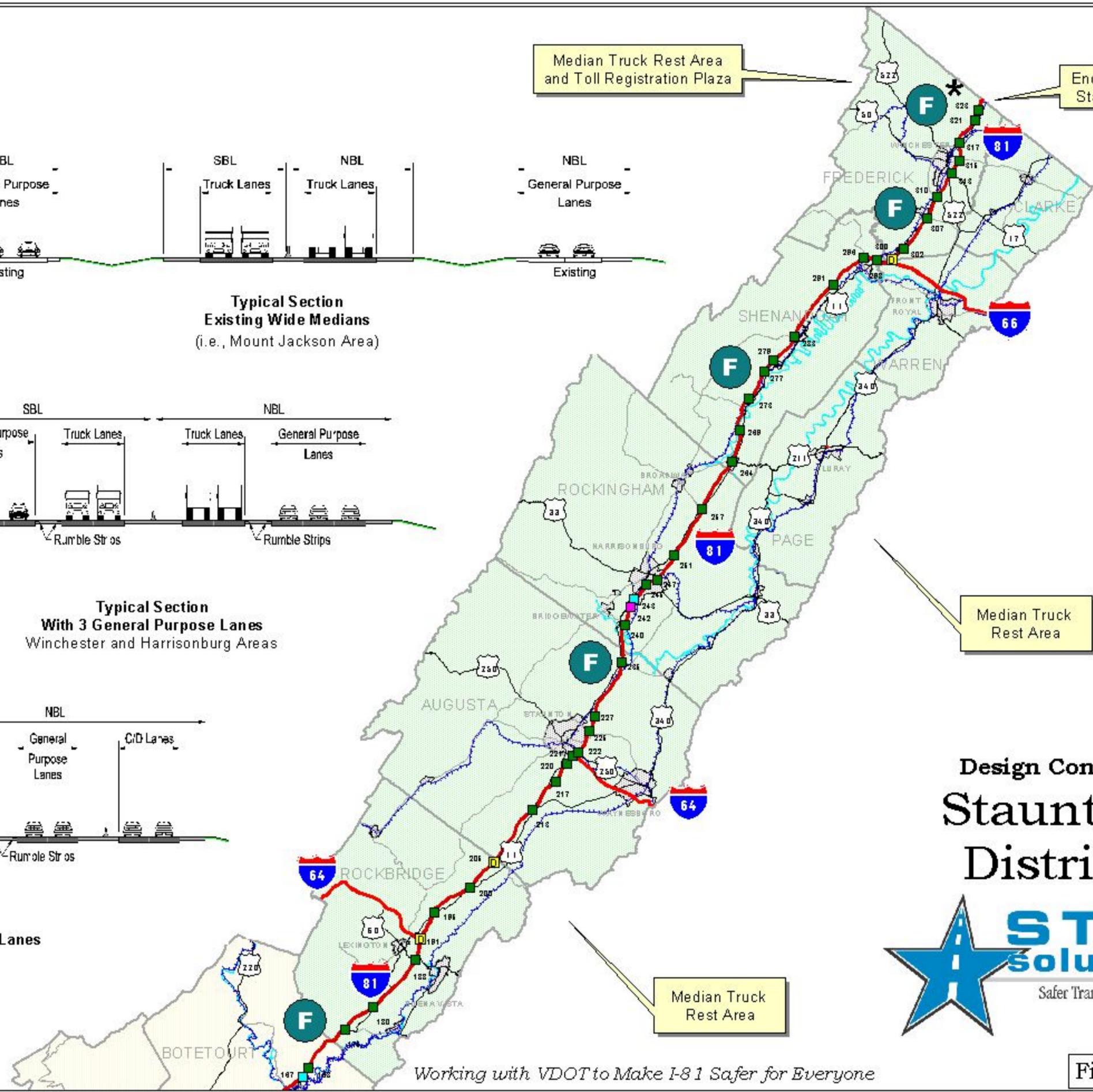
Salem District

Median Truck Rest Area and Toll Registration Plaza

End Project State Line

Median Truck Rest Area

Median Truck Rest Area



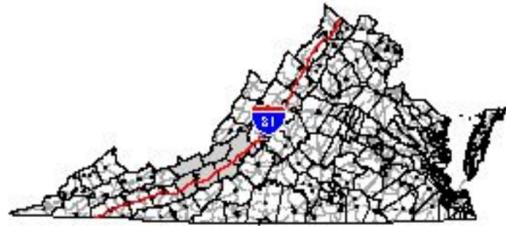
**Design Concept  
Staunton  
District**



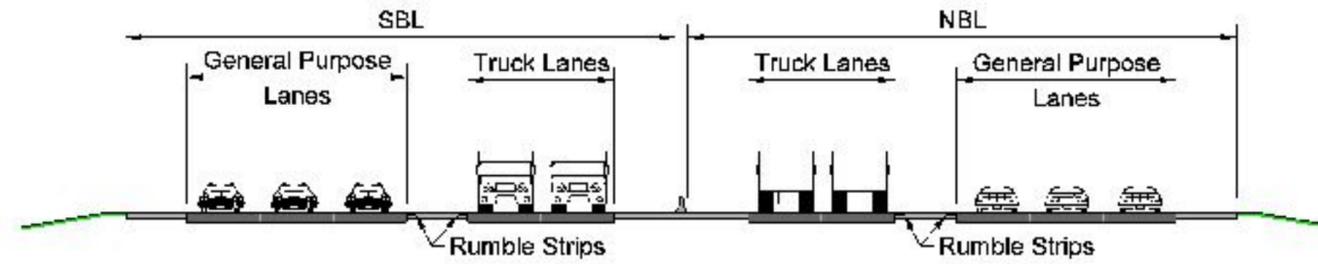
Working with VDOT to Make I-81 Safer for Everyone

Figure A - 2

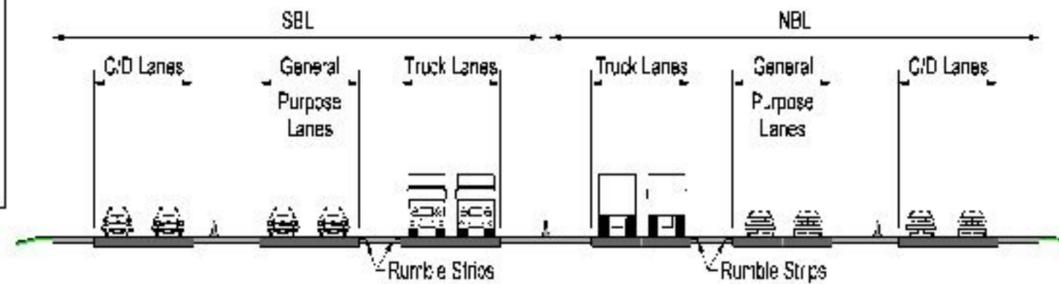
Map Not to Scale



**Area of Detail**



**Typical Section  
With 3 General Purpose Lanes**  
North Roanoke/South Botetourt Area



**Typical Section  
With Collector/Distributor (C/D) Lanes**  
Christiansburg and Salem Areas

- Key to Features
- Flyover
  - Interchange to be Improved
  - Dual Interchange (Separate Ramps for Cars and Trucks)
  - New or Replacement Interchange
  - Interchange to be Combined or Replaced
  - Interchange - No Work Anticipated

\* Denotes Half-Flyover at Beginning and End of Project



Median Truck Rest Area

Median Truck Rest Area

**Design Concept  
Salem  
District**



*Working with VDOT to Make I-81 Safer for Everyone*

**Figure A - 3**

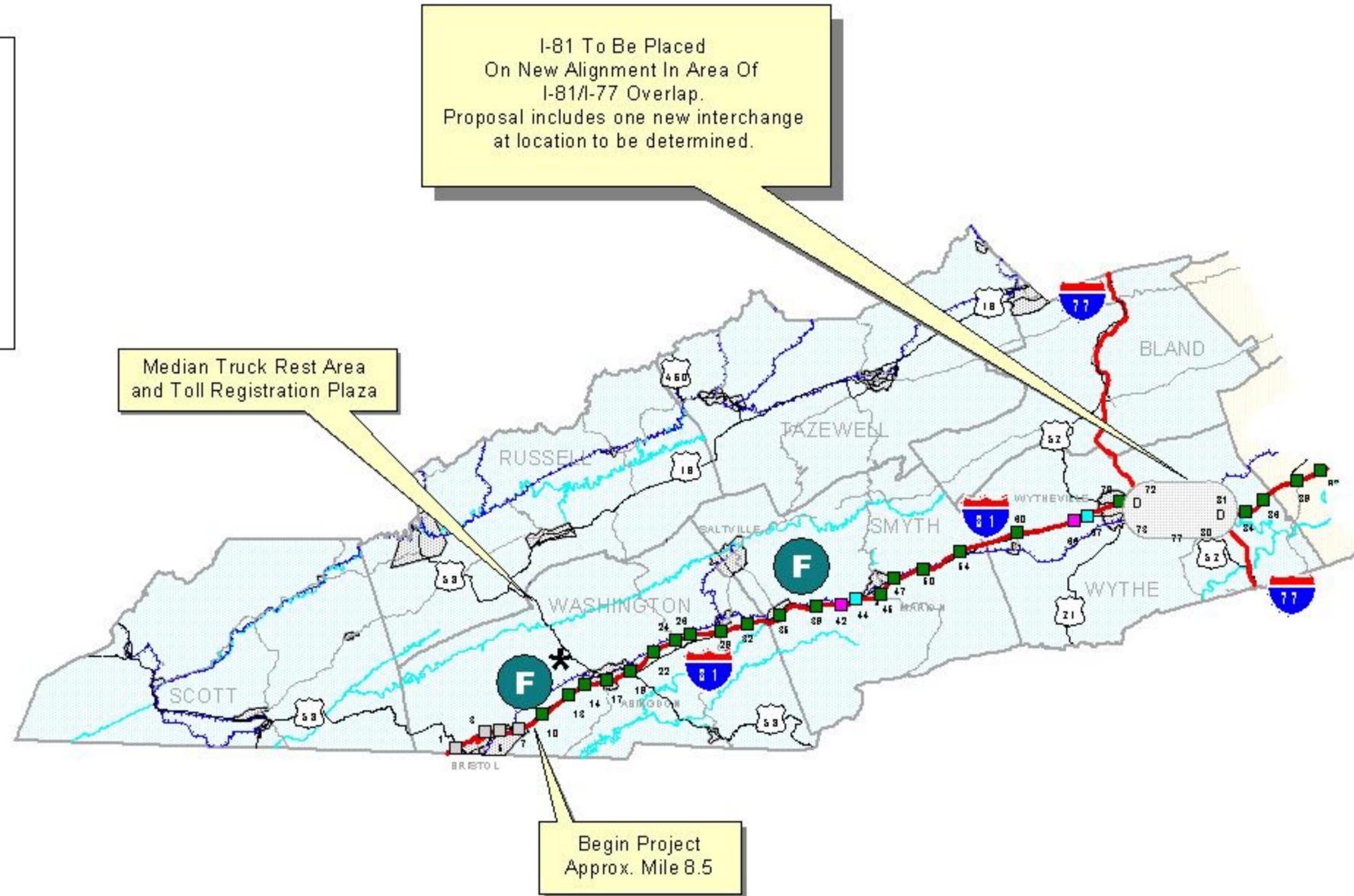


**Area of Detail**

**Key to Features**

- F Flyover
- Interchange to be Improved
- D Dual Interchange (Separate Ramps for Cars and Trucks)
- New or Replacement Interchange
- Interchange to be Combined or Replaced
- Interchange - No Work Anticipated

★ Denotes Half-Flyover at Beginning and End of Project



Salem District

**Design Concept  
Bristol  
District**



Virginia Department of Transportation  
Interstate 81 Improvements

Figure A-5: Existing and Proposed  
Bridge Structures

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	2043	NBL ROUTE I-81	OLD DOMINION ROAD	9.1	1963	35	44.0	141.0	85.3	Replace	
81	2042	SBL ROUTE I-81	OLD DOMINION ROAD	9.1	1963	35	44.0	141.0	85.3	Replace	
F310	1136	ROUTE 0F310	RTES 58 & 81	10.0	1963	266	33.0	363.0	34.0	Replace	
81	2041	NBL ROUTE 81	RT 808 & SINKING CREEK	11.1	1963	219	37.0	401.0	85.3	Replace	
81	2040	SBL ROUTE I-81	RTE 808 & SINKING CREEK	11.1	1963	219	33.4	401.0	85.3	Replace	
81	2001	NBL ROUTE 0081	RT 611 & SPRING CREEK	13.1	1961	172	44.0	141.0	85.3	Replace	
81	2000	SBL ROUTE 0081	RT 611 & SPRING CREEK	13.1	1961	172	44.0	141.0	85.3	Replace	
81	2003	NBL ROUTE 0081	RT 647	15.0	1961	191	45.0	192.3	85.3	Replace	
81	2002	SBL ROUTE 0081	RT 647	15.0	1961	191	44.0	192.3	85.3	Replace	
81	2005	NBL ROUTE 0081	RT 794	16.2	1961	105	44.0	183.7	85.3	Replace	
81	2004	SBL ROUTE 0081	RT 794	16.2	1961	105	44.0	183.7	85.3	Replace	
81	2007	NBL ROUTE 0081	RT 75	17.2	1961	137	44.0	718.5	73.8	Replace	SPUI
81	2006	SBL ROUTE 0081	RT 75	17.2	1961	137	44.0	718.5	73.8	Replace	SPUI
81	2009	NBL ROUTE 0081	VA CREEPER HIKING TRAIL	18.0	1961	215	44.0			Demo	replace w/ pedestrian culvert
81	2008	SBL ROUTE 0081	VA CREEPER HIKING TRAIL	18.0	1961	209	44.0			Demo	replace w/ pedestrian culvert
81	2045	NBL ROUTE I-81	RTE 793	18.6	1961	23	44.0	140.7	85.3	Replace	
81	2044	SBL ROUTE I-81	RTE 793	18.6	1961	23	44.0	140.7	85.3	Replace	
81	2012	NBL ROUTE 0081	RTS 11 & 58	19.7	1961	239	49.0	380.1	85.3	Replace	
81	2011	SBL ROUTE 0081	RTS 11 & 58	19.7	1961	236	49.0	380.1	85.3	Replace	
704	6367	ROUTE 0704	RTE 81	22.4	1994	204	85.3	260.0	85.3	Replace	
81	2027	NBL ROUTE 0081	RT 694 & HOG THIEF CREEK	23.3	1962	166	44.0	126.2	85.3	Replace	
81	2026	SBL ROUTE 0081	RT 694 & HOG THIEF CREEK	23.3	1962	166	44.0	126.2	85.3	Replace	
81	2025	NBL ROUTE 0081	RT 80	25.0	1962	138	44.0	236.2	85.3	Replace	
81	2024	SBL ROUTE 0081	RT 80	25.0	1962	138	44.0	236.2	85.3	Replace	
737	6394	ROUTE 0737	RTE 81	26.4	1962	248	29.0	260.0	34.0	Replace	
81	2031	NBL ROUTE 0081	RT 767	28.8	1962	129	5.0	129.0	46.3	Widen	
81	2030	SBL ROUTE 0081	RT 767	28.8	1962	133	5.0	133.0	46.3	Widen	
81	2029	NBL ROUTE 0081	RT 91	29.4	1962	155	44.0	157.5	44.0	Replace	
81	2028	SBL ROUTE 0081	RT 91	29.4	1962	149	44.0	157.5	44.0	Replace	
11	1135	ROUTE 0011	& RT 751 O RT 81	32.0	1963	220	33.8	280.0	34.0	Replace	
81	2003	INTERSTATE 81 NBL	M FORK HOLSTON RIVER	34.9	1962	237	5.0	237.0	53.3	Widen	
81	2002	SBL ROUTE 0081	M FORK HOLSTON RIVER	34.9	1962	238	5.0	238.0	58.3	Widen	
81	2005	NBL ROUTE 0081	ROUTE 107	35.3	1963	137	44.0	187.0	85.3	Replace	
81	2004	SBL ROUTE 81	RT 107	35.3	1963	137	44.0	187.0	85.3	Replace	
81	2001	NBL ROUTE 81	RT 638	36.7	1962	107	5.0	107.0	46.3	Widen	
81	2000	INTERSTATE 81 SBL	ROUTE 638	36.7	1962	118	5.0	118.0	46.3	Widen	
11	1074	ROUTE 11	ROUTE I-81	39.2	1963	212	33.0	246.1	45.9	Replace	
	new	ROUTE 11	ROUTE I-81	39.3				328	98.4	New	relocated north per study
11	1073	LEE HIGHWAY	RT 81	41.9	1962	212	33.0	260.0	34.0	Replace	
707	6308	LAUREL SPRINGS RD.	RTE 81	42.5	1962	223	29.0	260.0	34.0	Replace	
81	2006	INTERSTATE 81 NBL	RAMP A & F007	43.4	1962	182	45.3			Demo	Exit 44 eliminated
81	2007	INTERSTATE 81 SBL	RAMP A & F007	43.4	1962	190	45.3			Demo	Exit 44 eliminated

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\* Width of bridge demolition for widening or replacement.

Virginia Department of Transportation  
Interstate 81 Improvements

Figure A-5: Existing and Proposed  
Bridge Structures

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
730	6309	WASHINGTON AVENUE	RTE 81	44.0	1962	217	33.0			Demo	part of Exit 44 elimination
81	2008	INTERSTATE 81 NBL	RT658(SCRATCH GRAVEL)&CK	45.1	1962	243	37.0	243.0	85.3	Replace	
81	2009	INTERSTATE 81 SBL	R658 SCRATCH GRAVEL RD.	45.1	1962	222	37.0	222.0	85.3	Replace	
81	2805	INTERSTATE 81 SBL	MATSON DR & HOOKS BRANCH	45.5	1963	210	5.0	210.0	41.3	Widen	
81	2804	INTERSTATE 81 NBL	MATSON DR & HOOKS BRANCH	45.5	1963	219	5.0	219.0	53.3	Widen	
81	2800	SBL ROUTE 0081	RTE 16 (COMMERCE ST)	45.9	1963	179	44.0	179.0	85.3	Replace	
81	2801	NBL ROUTE 0081	RTE 16 (COMMERCE ST)	45.9	1963	179	44.0	179.0	85.3	Replace	
81	2017	NBL ROUTE 81	RTE. 691 (JOHNSTON ROAD)	47.2	1963	112	44.0	112.0	85.3	Replace	
81	2016	SBL ROUTE 81	RTE. 691 (JOHNSTON ROAD)	47.2	1963	112	44.0	112.0	85.3	Replace	
	new	New Bridge	I-81 NBL & SBL	47.7				280.0	34.0	New	new 2 lane bridge per study
	new	New Bridge	NS RAILWAY	47.7				620.0	68.0	New	new 4 lane bridge per study
81	2015	NBL ROUTE 0081	RTE F010 FROM RTE 11	47.9	1963	126	5.0	126.0	45.0	Widen	
81	2014	SBL ROUTE 0081	RTE F010 FROM RTE 11	47.9	1963	126	5.0	126.0	44.9	Widen	
81	2013	NBL ROUTE 0081	RT 689	48.9	1963	148	5.0	148.0	46.3	Widen	
81	2012	SBL ROUTE 0081	RT 689	48.9	1963	164	5.0	164.0	46.3	Widen	
81	2011	NBL INTERSTATE 81	ROUTE 690	49.6	1963	153	5.0	153.0	46.3	Widen	
81	2010	SBL INTERSTATE 81	ROUTE 690	49.6	1963	153	5.0	153.0	46.3	Widen	
81	2020	NBL INTERSTATE 81	RT 622 AND NICKS CREEK	50.9	1963	204	44.0	204.0	85.3	Replace	
81	2021	SBL ROUTE 0081	RT 622 & NICKS CREEK	50.9	1963	204	44.0	204.0	85.3	Replace	
81	2018	ROUTE 81	SBL RAMP C OV NICKS CR	50.9	1990	32	5.0	32.0	82.8	Replace	bridge at bottom of SBL ramp
81	2019	ROUTE 81	NBL RAMP D OV NICKS CR	50.9	1990	32	37.0	32.0	20.5	Replace	bridge at bottom of NBL ramp
81	2031	NBL ROUTE 81	ROUTE 686	51.5	1963	179	44.0	179.0	85.3	Replace	
81	2030	SBL ROUTE 81	RTE 686	51.5	1963	179	44.0	179.0	85.3	Replace	
81	2022	NBL ROUTE 81	RTE 615 (KIAWANA ROAD)	52.3	1963	111	44.0	111.0	85.3	Replace	
81	2023	SBL ROUTE 81	RTE. 615 (KIAWANA ROAD)	52.3	1963	111	44.0	111.0	85.3	Replace	
81	2034	NBL ROUTE 81	"RT11,NS RR,M.F.HOLSTON R"	53.0	1964	484	35.0	484.0	85.3	Replace	
81	2035	SBL ROUTE 81	"RT11,NS RR,M.F.HOLSTON R"	53.0	1964	501	35.0	501.0	85.3	Replace	
81	2032	NBL ROUTE 0081	RT 683	54.9	1964	119	44.0	119.0	85.3	Replace	
81	2033	SBL ROUTE 0081	RT 683	54.9	1964	119	44.0	119.0	85.3	Replace	
681	6312	HARRIS LANE	INTERSTATE 81	56.8	1964	203	29.0	260.0	34.0	Replace	
81	2003	NBL ROUTE 0081	RT 682	58.5	1963	116	5.0	116.0	46.3	Widen	
81	2002	SBL ROUTE 0081	RT 682	58.5	1963	116	5.0	116.0	46.3	Widen	
81	2005	ROUTE 0081 N.B.L.	ROUTE 90	60.7	1963	118	44.0	160.8	85.3	Replace	
81	2004	ROUTE 0081 S.B.L.	ROUTE 90	60.7	1963	118	44.0	160.8	85.3	Replace	
81	2007	ROUTE 0081 N.B.L.	ROUTE 625	63.2	1963	124	44.0	144.4	85.3	Replace	
81	2006	ROUTE 0081 S.B.L.	ROUTE 625	63.2	1963	124	44.0	144.4	85.3	Replace	
81	2009	NBL ROUTE 0081	RT 666_HOGBACK ROAD	64.8	1963	125	5.0	125.0	46.3	Widen	
81	2008	SBL ROUTE 0081	RT 666_HOGBACK ROAD	64.8	1963	125	5.0	125.0	46.3	Widen	
	new	F-039 to Rt 11 Conn	I-81 NBL & SBL	66.2				260.0	46.0	New	
663	6195	BISHOP THOMAS RD	RTE 81	66.7	1963	266	25.0			Demo	
81	2018	NBL ROUTE 0081	REED CREEK	68.0	1964	560	35.0	567.6	85.3	Replace	
81	2019	SBL ROUTE 0081	REED CREEK	68.0	1964	550	35.0	567.6	85.3	Replace	

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\* Width of bridge demolition for widening or replacement.

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	2015	SBL ROUTE 0081	TOWN ROUTE(WEST RIDGERD)	69.0	1964	120	5.0	120.0	46.3	Widen	
81	2014	NBL ROUTE 0081	RT 656 (WEST RIDGE RD.)	69.0	1964	120	5.0	120.0	46.3	Widen	
81	2803	SBL ROUTE 0081	RTE 52	70.9	1964	265	35.0	298.6	85.3	Replace	
81	2802	NBL ROUTE 0081	RTE 52	70.9	1964	265	34.0	298.6	85.3	Replace	
603	8000	COVEROAD	COVE RD O RTES 52 & I 81	72.0	1964	285	36.4	360.0	43.0	Replace	
81	2800	NBL ROUTE 0081	PEPPERS FERRY ROAD	72.3	1964	128	44.0	128.0	85.3	Replace	
81	2801	SBL ROUTE 0081	PEPPERS FERRY ROAD	72.3	1964	128	44.0	128.0	85.3	Replace	
81	2805	SBL ROUTE 0081	RTE I-77	73.0	1964	284	35.0	284.0	85.3	Replace	
81	2804	NBL ROUTE 0081	RTE I 77	73.0	1964	284	35.0	284.0	85.3	Replace	
0	2819	LITHA ROAD	ROUTE 81	69.9	1986	234	37.8			No Impact	Not included in Proposal
81	2816	RAMP A OVER 81	ROUTES I77 & I81	74.0	1986	235	31.8			No Impact	Not included in Proposal
81	2817	LOOP A OVER I-81	ROUTES I-77 & I-81	74.0	1986	235	33.8			No Impact	Not included in Proposal
81	2010	RAMP A OVER RTE.81	ROUTE 81	74.2	1963	365	25.0			No Impact	Not included in Proposal
0	2065	LOVERSLANE	ROUTE 81 & 77	74.3	1985	235	38.0			No Impact	Not included in Proposal
81	2814	NBL ROUTE 0081	NS RAILWAY	74.5	1986	153	55.8			No Impact	Not included in Proposal
81	2815	SBL ROUTE 0081	NS RAILWAY	74.5	1986	225	55.8			No Impact	Not included in Proposal
81	2808	NBL ROUTE 0081	REED CREEK	75.2	1985	167	55.8			No Impact	Not included in Proposal
81	2820	SBL ROUTE 0081	REED CREEK	75.2	1986	167	55.8			No Impact	Not included in Proposal
0	2064	RTE. 0000 FR CONN	ROUTE 81 & 77	77.7	1985	234	37.8			No Impact	Not included in Proposal
52	1114	SBL ROUTE 0052	RTES 11 & 81 @ FT-CHISWL	80.1	1969	284	35.0			No Impact	Not included in Proposal
52	1115	NBL ROUTE 0052	RTES 11 & 81 @ FTCHIS	80.1	1969	284	35.0			No Impact	Not included in Proposal
77	2053	NBL ROUTE 0077	RMP FA O ROUTE 81	81.8	1978	260	44.0			New	New dual interchange
77	2054	ROUTE 77_SBL	ROUTE 0081	81.8	1978	257	44.0			New	New dual interchange
81	2000	NBL ROUTE 0081	REED CREEK	83.0	1960	298	35.1	298.0	85.3	Replace	
81	2001	SBL ROUTE 0081	REED CREEK	83.0	1960	298	35.1	298.0	85.3	Replace	
619	6186	ROUTE 0619	RT 81 & 11	84.1	1960	226	29.0	260.0	34.0	Replace	
618	6188	ROUTE 0618	RTES 81 & 11	86.2	1961	227	29.0	260.0	46.0	Replace	
654	6140	OLDBALTIMORE RD654	RTES 81 & 11	87.8	1961	223	29.5	260.0	34.0	Replace	
81	2000	NBL ROUTE 0081	RTES 100 & 11	90.0	1959	195	45.0	229.7	85.3	Replace	
81	2001	SBL ROUTE 0081	RTES 100 & 11	90.0	1959	195	45.0	229.7	85.3	Replace	
F327	6136	ROUTE F327	RTES I 81 & 100	92.4	1959	238	29.0	260.0	34.0	Replace	
81	2002	NBL ROUTE 0081	RT99/COUNT PULASKI DR.	94.3	1960	247	46.0	247.0	85.3	Replace	
81	2003	SBL ROUTE 0081	RT99/COUNT PULASKI DR.	94.3	1960	226	44.0	229.7	85.3	Replace	
81	2006	NBL ROUTE 0081	NEW RIVER TRAIL ST. PARK	94.5	1960	176	5.0	176.0	46.3	Widen	
81	2007	SBL ROUTE 0081	NEW RIVER TRAIL S. P.	94.5	1960	176	5.0	176.0	46.3	Widen	
81	2004	NBL ROUTE 0081	PEAK CREEK	96.0	1960	372	5.0	372.0	47.8	Widen	
81	2005	SBL ROUTE 0081	PEAK CREEK	96.0	1960	372	5.0	372.0	47.8	Widen	
81	2024	NBL ROUTE 0081	RTE 644_MILLER LANE	97.0	1965	124	5.0	124.0	46.3	Widen	
81	2025	SBL ROUTE 0081	RTE 644_(MILLER LANE)	97.0	1965	124	5.0	124.0	46.3	Widen	
81	2026	NBL ROUTE 0081	RTE 611_NEWBERN RD.	97.6	1965	130	44.0	203.4	85.3	Replace	
81	2027	SBL ROUTE 0081	RTE 611_NEWBERN RD.	97.6	1965	126	44.0	203.4	85.3	Replace	
81	2028	NBL ROUTE 0081	RTE 100	98.9	1965	254	42.4	254.0	85.3	Replace	

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	2029	SBL ROUTE 0081	RTE 100	98.9	1965	248	42.4	248.0	85.3	Replace	
611	6166	NEWBERN ROAD	RTE I 81	99.2	1965	248	36.5	260.0	34.0	Replace	
660	6165	STATE PARK ROAD	RTE I 81	101.0	1965	257	35.0	260.0	46.0	Replace	
81	2030	NBL ROUTE 81	RTE 799	104.1	1965	136	10.0	136.0	51.3	Widen	
81	2031	SBL ROUTE 0081	RTE 799	104.1	1965	131	44.0	131.0	85.3	Widen	
81	2901	NBL ROUTE 0081	"NEW RIVER, NS RWY, RT605"	105.0	1965	1,600	5.0	1600.0	48.4	Widen	
81	2900	SBL ROUTE 0081	"NEW RIVER, NS RWY, RT605"	105.0	1965	1,658	5.0	1600.0	48.4	Widen	
232	1044	"RTE 232, RAMPS A&B"	RTE. I-81	105.5	1965	294	47.0	294.0	47.0	Replace	
787	6283	DRY VALLEY RD.	RTE I 81	108.0	1965	255	29.0	260.0	34.0	Replace	
177	1062	WBL ROUTE 0177	RTE I 81	109.5	1965	306	35.0	306.0	34.0	Replace	
177	1065	EBL ROUTE 0177	RTE I 81	109.5	1965	306	35.0	306.0	34.0	Replace	
81	2000	NBL ROUTE 0081	RTE 8	114.2	1964	200	35.0	200.0	55.3	Replace	
81	2001	ROUTE 81 SBL	RTE 8	114.2	1964	200	35.0	200.0	55.3	Replace	
0	8001	SOUTH FRANKLIN ST	RTE I-81	115.7	1964	295	40.0	295.0	40.0	Replace	
81	1816	I81 NBL	RTE. 460	117.7	2001	184	62.3			No Impact	Not included in Proposal
81	1813	NBL COLLECTOR	RTE. 460_BYPASS	117.7	1999	184	54.5			No Impact	Not included in Proposal
81	1815	I81 SBL	RTE. 460	118.1	2001	184	62.3			No Impact	Not included in Proposal
81	1810	SB COLLECTOR RD.	RTE. 460_BYPASS	118.1	1999	184	54.5			No Impact	Not included in Proposal
81	1817	NBL COLLECTOR	RTE. 11 (460)	118.6	1999	236	54.5			No Impact	Not included in Proposal
81	1814	SB COLLECTOR	RTE. 11/460	118.6	1999	222	54.5			No Impact	Not included in Proposal
81	1812	I81 NBL	RTE. 11/460 BUSINESS	118.7	2001	229	67.5			No Impact	Not included in Proposal
81	1811	I81 SBL	RTE. 11/460	119.1	2001	227	79.2			No Impact	Not included in Proposal
81	2004	NBL ROUTE 0081	NS RAILWAY & RTE 641	120.8	1970	174	10.0	174.0	53.3	Widen	Smart Road Interchange not included
81	2005	SBL ROUTE 0081	NS RAILWAY & RTE 641	120.8	1970	166	10.0	166.0	53.3	Widen	
636	6001	ROUTE 0636	RTE I 81	122.6	1970	269	29.0	269.0	34.0	Replace	
636	6002	ROUTE 0636	RTE I 81	125.0	1970	281	29.0	281.0	34.0	Replace	
603	6316	NORTH FORK RD.	RTE I 81	128.3	1970	287	33.0	295.3	34.0	Replace	
81	2006	NBL ROUTE 0081	NS RAILWAY & ROANOKE RV	128.5	1970	345	56.0	345.0	85.3	Replace	
81	2007	SBL ROUTE 0081	NS RAILWAY & ROANOKE RV	128.5	1970	326	44.0	326.0	85.3	Replace	
81	2051	NBL ROUTE 0081	RTE 647_DOW HOLLOW RD.	132.1	1970	194	5.0	194.0	48.3	Widen	
81	2052	SBL ROUTE 0081	RTE 647_DOW HOLLOW RD.	132.1	1970	194	5.0	194.0	48.3	Widen	
81	2020	NBL ROUTE 0081	RT927/GLENVAR HGHTS BLVD	133.5	1964	130	5.0	130.0	46.3	Widen	
81	2021	SBL ROUTE 0081	RT927-GLENVAR HEIGHTS BL	133.5	1964	136	5.0	136.0	46.3	Widen	
81	2022	NBL ROUTE 0081	777 FORT LEWIS CHURCH RD	134.7	1964	153	5.0	153.0	46.3	Widen	
81	2023	SBL ROUTE 0081	777 FORT LEWIS CHURCH RD	134.7	1964	153	5.0	153.0	46.3	Widen	
643	6260	DAUGHRETY ROAD	RTE 81	135.2	1962	244	29.0	260.0	34.0	Replace	
81	2006	NBL ROUTE 0081	"RT642, ALLEGHANY DR."	135.5	1962	107	5.0	107.0	46.3	Widen	
81	2007	SBL ROUTE 0081	ALLEGHANY DRIVE_(RT642)	135.5	1962	107	5.0	107.0	46.3	Widen	
81	2000	NBL ROUTE 0081	RTE 640/BUTT HOLLOW RD.	136.0	1962	112	5.0	112.0	46.3	Widen	
81	2001	SBL ROUTE 0081	"RTE 640,BUTT HOLLOW ROAD"	136.0	1962	112	5.0	112.0	46.3	Widen	
81	2002	81 NBL	RTE 641_TEXAS HOLLOW RD	136.6	1962	109	5.0	109.0	46.3	Widen	
81	2003	SBL ROUTE 0081	RTE 641_TEXAS HOLLOW RD	136.6	1962	109	5.0	109.0	46.3	Widen	

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	2004	NBL ROUTE 0081	RTE 112_WILDWOOD RD.	137.2	1962	202	44.0	202.0	85.3	Replace	
81	new	NB CD LANE ROUTE 0081	RTE 112_WILDWOOD RD.					202.0	45.3	New	
81	2005	SBL ROUTE 0081	RTE 112_WILDWOOD RD.	137.2	1962	202	44.0	202.0	45.3	Replace	
81	new	SB CD LANE ROUTE 0081	RTE 112_WILDWOOD RD.					202.0	85.3	New	
81	2010	NBL ROUTE 0081	RTE 635-GOODWIN AVENUE	138.5	1962	126	5.0	126.0	46.3	Widen	
81	new	NB CD LANE ROUTE 0081	RTE 635-GOODWIN AVENUE	138.5				126.0	45.3	New	
81	2011	SBL ROUTE 0081	RTE 635-GOODWIN AVENUE	138.5	1962	126	5.0	126.0	46.3	Widen	
81	new	SB CD LANE ROUTE 0081	RTE 635-GOODWIN AVENUE	138.5				126.0	45.3	New	
81	2008	NBL ROUTE 0081	RT619/E. WILDWOOD ROAD	139.0	1962	161	5.0	161.0	46.3	Widen	
81	new	NB CD LANE ROUTE 0081	RT619/E. WILDWOOD ROAD	139.0				161.0	45.3	New	
81	2009	SBL ROUTE 0081	RT619/E. WILDWOOD ROAD	139.0	1962	161	5.0	161.0	46.3	Widen	
81	new	SB CD LANE ROUTE 0081	RT619/E. WILDWOOD ROAD	139.0				161.0	45.3	New	
705	6263	RTE 705 RED LANE	RTE I 81	139.3	1963	268	29.2	365.0	34.0	Replace	
81	2014	SBL ROUTE 0081	RTE 311	140.0	1986	144	10.0	144.0	39.5	Widen	
81	new	SB CD LANE ROUTE 0081	RTE 311	140.0				144.0	45.3	New	
81	2015	NBL ROUTE 0081	RTE 311	140.0	1986	144	10.0	144.0	51.5	Widen	
81	new	NB CD LANE ROUTE 0081	RTE 311	140.0				144.0	45.3	New	
81	2016	"SBL, I81"	RTE 630 & MASON CREEK	141.1	1997	346	75.3	346.0	45.3	No Impact	
81	2017	"NBL, I81"	"RTE 630, & MASON'S CREEK"	141.1	1997	346	75.3	346.0	45.3	No Impact	
419	1088	ELECTRIC ROAD	RTE I 81	141.5	1963	258	73.0	365.0	73.0	Replace	
81	2018	NBL ROUTE 0081	SW & NW RAMPS RT 581	143.8	1963	356	37.2	780.8	85.3	Replace	
81	new	NB CD LANE ROUTE 0081	SW & NW RAMPS RT 581	143.8				780.8	45.3	New	
81	2019	RT 81_SBL RAMP	RT581 NW RAMP & RT81 NBL	143.8	1963	160	44.0	252.6	45.3	Replace	
81	2012	SBL ROUTE 0081	RTE 1836_BELLE HAVEN RD.	145.1	1963	110	10.0	110.0	51.3	Widen	
81	2013	NBL ROUTE 0081	RTE 1836_BELLE HAVEN RD.	145.1	1963	110	10.0	110.0	51.3	Widen	
115	6261	PlantationRd/Rt115	RTES I 81 & 220	146.7	1963	234	33.2	280.0	34.0	Replace	
81	2024	NBL ROUTE 0081	RTE 648	147.5	1963	106	5.0	106.0	46.3	Widen	
81	2025	SBL ROUTE 0081	RTE 648	147.5	1963	106	5.0	106.0	46.3	Widen	
81	2026	81 NBL	Tinker Creek & NS Rwy	149.6	1963	332	5.0	332.0	53.3	Widen	
81	2027	81 SBL	Tinker Creek & NS Rwy	149.6	1963	332	5.0	332.0	53.3	Widen	
81	2032	NBL ROUTE 0081	RTE 220 ALT	150.3	1964	174	44.0			New	New dual interchange
81	2033	SBL ROUTE 0081	RTE 220 ALT	150.3	1964	186	55.1			New	New dual interchange
81	2064	NBL ROUTE 0081	RAMP F O RAMP D	150.9	1987	81	31.8			New	New dual interchange
81	2034	NBL ROUTE 0081	VALLEY ROAD (RTE 779)	151.6	1964	126	5.0	126.0	46.3	Widen	
81	2035	SBL ROUTE 0081	VALLEY ROAD (RTE 779)	151.6	1964	120	5.0	126.0	46.3	Widen	
651	6417	SUNSET AVE. 651	RTE I 81	152.8	1964	233	29.0	260.0	34.0	Replace	
81	2040	NBL ROUTE 0081	RTE 670	154.0	1964	113	5.0	113.0	46.3	Widen	
81	2041	SBL ROUTE 0081	RTE 670	154.0	1964	113	5.0	113.0	46.3	Widen	
81	2036	NBL ROUTE 0081	RTE 676	155.2	1964	142	5.0	142.0	46.3	Widen	
81	2037	SBL ROUTE 0081	RTE 676	155.2	1964	131	5.0	131.0	46.3	Widen	
81	2038	NBL ROUTE 0081	RTE 640	156.4	1964	134	44.0	134.0	85.3	Replace	
81	2039	SBL ROUTE 0081	RTE 640	156.4	1964	137	44.0	137.0	85.3	Replace	

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	2022	81 SBL	RTE 606	158.9	1963	157	5.0	157.0	46.3	Widen	
81	2023	81 NBL	RTE 606	158.9	1963	139	5.0	139.0	46.3	Widen	
11	1113	ROUTE 0011	RTE I 81	159.7	1963	257	53.0	260.0	53.0	Replace	
636	6384	Hardbarger Rd 636	81	161.7	1963	207	29.0	260.0	34.0	Replace	
81	2030	81 SBL	Looney Mill Creek	162.0	1963	258	5.0	258.0	42.3	Widen	
81	2031	81 NBL	Looney Mill Creek	162.0	1963	253	5.0	253.0	53.3	Widen	
81	2028	SBL ROUTE 0081	RTE 11	162.2	1963	159	44.0	159.0	85.3	Replace	
81	2029	NBL ROUTE 0081	RTE 11	162.2	1963	159	44.0	159.0	85.3	Replace	
81	2000	81 SBL	Prease Rd 628	163.3	1962	107	44.0	107.0	85.3	Replace	
81	2001	NBL ROUTE 0081	RTE 628	163.3	1962	107	44.0	107.0	85.3	Replace	
81	2002	NBL ROUTE 0081	RTE 625	164.9	1962	120	44.0	120.0	85.3	Replace	
81	2003	SBL ROUTE 0081	RTE 625	164.9	1962	120	44.0	120.0	85.3	Replace	
81	2004	SBL ROUTE 0081	JAMES RIVER	165.1	1962	543	36.0	543.0	85.3	Replace	
81	2005	NBL ROUTE 0081	JAMES RIVER	165.1	1962	543	36.0	543.0	85.3	Replace	
81	2006	SBL ROUTE 0081	RTE 43 & CSX RAILWAY	165.2	1962	329	36.0	329.0	85.3	Replace	
81	2007	NBL ROUTE 0081	RTE 43 & CSX RAILWAY	165.2	1962	349	36.0	349.0	85.3	Replace	
81	2008	81 SBL	11 SBL	167.9	1962	143	44.0	143.0	85.3	Replace	
81	2009	81 NBL	11 SBL	167.9	1962	141	44.0	141.0	85.3	Replace	
81	2020	NBL ROUTE 0081	PURGATORY CREEK	168.0	1960	59	44.0	354.0	85.3	Replace	
81	2021	SBL ROUTE 0081	PURGATORY CREEK	168.1	1960	58	44.0	58.0	85.3	Replace	
614	6379	ARCADIA ROAD	RTES 11 & I 81	168.6	1959	227	29.7	260.0	34.0	Replace	
608	6378	Indian Rock Rd 608	81 & 11	170.2	1960	205	26.4	260.0	34.0	Replace	
623	6380	Buffalo Rd. 623	81 & 11	171.8	1959	235	29.5			Demo	
610	6385	Plank Road 610	Rtes. 11 & 81	173.4	1963	312	28.0	312.0	34.0	Replace	
693	6534	ROUTE 0693	RTE I 81	175.3	1963	272	29.2	280.0	34.0	Replace	
11	1132	ROUTE 0011	RTE I 81	176.0	1963	252	33.0	260.0	34.0	Replace	
81	2000	NBL ROUTE 0081	CEDAR CREEK & RTE 692	176.9	1963	273	5.0	273.0	53.1	Widen	
81	2001	SBL ROUTE 0081	CEDAR CREEK & RTE 692	176.9	1963	227	5.0	227.0	53.1	Widen	
690	6535	ROUTE 0690	RTE I 81	179.2	1963	221	27.1	260.0	34.0	Replace	
81	2002	NBL ROUTE 0081	RTE 11 & RAMP B	180.7	1963	252	37.2	121.4	62.3	Replace	
81	2015	SBL ROUTE 0081	RELOC RTE 11	180.7	1966	193	56.0	124.7	62.3	Replace	
680	6574	ROUTE 0680	RTE I 81 SBL	182.3	1966	165	29.0	124.7	33.5	Replace	
680	6573	ROUTE 0680	RTE I 81 NBL	182.3	1966	160	29.0	114.8	33.5	Replace	
679	6575	ROUTE 0679	RTE I 81 SBL	183.4	1966	162	29.0			Demo	
81	2016	NBL ROUTE 0081	RTE 679	183.9	1966	159	42.0			Demo	
81	2017	NBL ROUTE 0081	BUFFALO CREEK	184.1	1966	550	35.0			No Impact	
81	2018	SBL ROUTE 0081	BUFFALO CREEK	184.1	1966	464	35.0			No Impact	
699	6572	ROUTE 0699	RTE I 81	187.5	1966	370	29.0	347.8	33.5	Replace	
60	1147	EBL ROUTE 0060	RTE I 81	188.8	1966	277	47.0			Replace	
60	1148	WBL ROUTE 0060	RTE I 81	188.8	1966	277	52.0			Demo	Replace with one bridge
81	2013	NBL ROUTE 0081	MAURY RIVER	190.4	1966	705	34.0			No Impact	
81	2014	SBL ROUTE 0081	MAURY RIVER	190.4	1966	705	34.0			No Impact	

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Figure A-5: Existing and Proposed  
Bridge Structures

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	2011	NBL ROUTE 0081	RTE 631	191.0	1966	138	54.0			No Impact	
81	2012	SBL ROUTE 0081	RTE 631	191.0	1966	138	54.0	95.1	74.1	Replace	
81	new	NBL ROUTE 0081	RTE 631	191.0				111.5	62.3	New	
64	2105	EBL ROUTE 0064	RAMP A & RTE I81 SBL	191.3	1975	520	44.0			Demo	
81	2106	ROUTE 0064	"RM A O 81S,WRM RUN U2105"	191.4	1976	331	44.0			Demo	
81	2007	NBL ROUTE 0081	RTE 11	195.0	1965	245	5.0	246.1	55.3	Widen	
81	2008	SBL ROUTE 0081	RTE 11	195.0	1965	277	5.0	275.6	55.3	Widen	
81	2009	NBL ROUTE 0081	RTE 716 & MILL CREEK	196.0	1965	310	5.0	312.2	55.3	Widen	
81	2010	SBL ROUTE 0081	RTE 716 & MILL CREEK	196.0	1965	210	5.0	210.0	55.3	Widen	
712	6561	ROUTE 0712	RTE I 81	198.8	1965	267	29.0	147.6	33.5	Replace	
81	2003	NBL ROUTE 0081	RTE 710	200.7	1966	121	42.0	134.5	85.3	Replace	
81	2004	SBL ROUTE 0081	RTE 710	200.7	1966	123	42.0	134.5	85.3	Replace	
81	2005	NBL ROUTE 0081	RTE 606	205.1	1965	144	44.0	170.6	85.3	Replace	
81	2006	SBL ROUTE 0081	RTE 606	205.1	1964	144	44.0	170.6	85.3	Replace	
620	6686	ROUTE 0620	RTE 81	207.0	1965	251	29.0	252.6	33.5	Replace	
671	6688	ROUTE 0671	RTE 81	209.1	1966	339	29.0	315.0	33.5	Replace	
81	2000	NBL ROUTE 0081	RTE 675	210.1	1966	121	42.0	88.6	85.3	Replace	
81	2001	SBL ROUTE 0081	RTE 675	210.1	1966	115	42.0	88.6	85.3	Replace	
81	2002	NBL ROUTE 0081	RTE 662	211.8	1966	124	42.0	131.2	85.3	Replace	
81	2003	SBL ROUTE 0081	RTE 662	211.8	1966	230	5.0	229.7	48.3	Widen	
81	2004	NBL ROUTE 0081	RT 11	213.3	1966	249	5.0	249.3	48.3	Widen	
81	2005	SBL ROUTE 0081	RT 11	213.3	1966	250	5.0	249.3	38.3	Widen	
81	2017	NBL ROUTE 0081	RT 694	214.9	1968	116	42.0	114.8	68.9	Replace	
81	2018	SBL ROUTE 0081	RT 694	214.9	1968	121	42.0	91.9	62.3	Replace	
655	6732	ROUTE 0655	SBL RTE 81	216.1	1968	165	29.0	114.8	33.5	Replace	
655	6730	ROUTE 0655	NBL RTE 81	216.1	1968	153	29.0	114.8	33.5	Replace	
654	6731	ROUTE 0654	RTE I 81	218.0	1968	284	36.0	259.2	78.1	Replace	
81	2036	NBL ROUTE 0081	FOLLY MILLS CREEK	219.1	1969	202	5.0	200.1	48.3	Widen	
81	2037	SBL ROUTE 0081	FOLLY MILLS CREEK	219.1	1969	185	5.0	187.0	48.3	Widen	
647	6749	ROUTE 0647	SBL RTE 81	219.9	1969	131	32.0	337.9	42.7	Replace	
647	6748	ROUTE 0647	NBL RTE 81	219.9	1969	157	32.0			Demo	
262	1244	ROUTE 0262	ROUTE 81 N&SBL	220.8	1981	282	73.0			No Impact	
	new	ROUTE 0262	ROUTE 81 N&SBL	220.8				75.5	71.7	New	
635	6750	ROUTE 0635	RTE 81	221.0	1969	342	30.0	400.3	33.5	Replace	
64	2029	WBL ROUTE 0064	RTE 81	221.9	1969	367	36.0	643.0	50.5	Replace	
81	2019	NBL ROUTE 0081	RAMP 1 - INT 64	221.9	1969	182	5.0	183.7	48.3	Widen	
81	2028	SBL ROUTE 0081	RAMP 1	221.9	1969	207	5.0	206.7	48.3	Widen	
81	2044	NBL ROUTE 0081	C&O RAILWAY & ACC ROAD	222.4	1967	173	54.0	173.9	85.3	Replace	
81	2045	SBL ROUTE 0081	C&O RAILWAY & ACC ROAD	222.4	1969	173	54.0	173.9	85.3	Replace	
	new	SBL ROUTE 0081	C&O RAILWAY & ACC ROAD	222.4				154.2	45.3	New	
81	2046	NBL ROUTE 0081	RT 250	222.5	1969	224	54.0	200.1	85.3	Replace	
81	2047	SBL ROUTE 0081	RT 250	222.5	1969	222	42.0	196.9	85.3	Replace	

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\* Width of bridge demolition for widening or replacement.

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Figure A-5: Existing and Proposed  
Bridge Structures

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	new	CD ROUTE 0081	RT 250	222.5				200.0	45.3	New	
254	1238	ROUTE 0254	RTE 81	224.2	1968	296	36.5	308.4	42.7	Replace	
81	2107	NBL ROUTE 0081	LEWIS CREEK	225.0	1968	210	5.0	210.0	48.3	Widen	
81	2106	SBL ROUTE 0081	LEWIS CREEK	225.0	1968	225	5.0	226.4	48.3	Widen	
81	2104	NBL ROUTE 0081	RT 275	225.7	1968	151	5.0	150.9	48.3	Widen	
81	2105	SBL ROUTE 0081	RTE 275	225.7	1968	151	5.0	150.9	48.3	Widen	
612	6699	EBL ROUTE 0612	RTE 81	227.6	1968	304	35.0	285.4	42.7	Replace	
612	6700	WBL ROUTE 0612	RTE 81	227.6	1968	304	38.5	285.4	42.7	Replace	
81	2022	NBL ROUTE 0081	CHW RAILWAY SPUR	228.0	1967	179	42.0			Demo	
81	2023	SBL ROUTE 0081	CHW RAILWAY SPUR	228.0	1967	179	42.0			Demo	
81	2020	NBL ROUTE 0081	MIDDLE RIVER	228.2	1967	516	5.0	518.4	55.3	Widen	
81	2021	SBL ROUTE 0081	MIDDLE RIVER	228.2	1967	516	5.0	515.1	55.3	Widen	
781	6692	ROUTE 0781	RTE 81	228.4	1966	314	29.0	295.3	33.5	Replace	
742	6693	ROUTE 0742	RTE 81	230.3	1966	308	29.0	332.0	42.7	Replace	
616	6694	ROUTE 0616	RTE 81	231.1	1966	304	29.0	323.5	33.5	Replace	
775	6695	ROUTE 0775	RTE 81	232.6	1966	305	29.0	325.5	33.5	Replace	
750	6689	ROUTE 0750	RTE 81	233.9	1966	293	33.0	312.3	42.7	Replace	
81	2006	NBL ROUTE 0081	CHW RAILWAY	234.7	1966	192	5.0	194.6	48.3	Widen	
81	2007	SBL ROUTE 0081	CHW RAILWAY	235.0	1966	192	5.0	194.2	48.3	Widen	
256	1228	ROUTE 0256	RTE 81	235.2	1966	262	33.0	301.8	54.5	Replace	
994	6690	ROUTE 0994	RTE 81	236.7	1966	280	29.0	321.5	33.5	Replace	
81	2008	NBL ROUTE 0081	NAKED CREEK	237.1	1966	168	5.0	170.3	48.3	Widen	
81	2009	SBL ROUTE 0081	NAKED CREEK	237.4	1966	168	5.0	170.3	48.3	Widen	
990	6564	ROUTE 0990	RTE 81	238.3	1966	276	29.0	304.1	33.5	Replace	
867	6565	ROUTE 867	I-81	239.5	1966	243	29.0	299.2	33.5	Replace	
81	2024	I-81 NBL	NORTH RIVER	239.7	1966	440	5.0	440.0	55.3	Widen	
81	2025	I-81 SBL	NORTH RIVER	240.0	1966	440	5.0	440.0	55.3	Widen	
257	1176	ROUTE 257	I-81	240.0	1993	323	85.3			No Impact	
704	6566	ROUTE 704	I-81	241.6	1966	310	29.0	308.4	33.5	Replace	
81	2020	I-81 NBL	BLACKS RUN	242.4	1966	138	5.0	140.4	48.3	Widen	
81	2021	I-81 SBL	BLACKS RUN	242.4	1966	138	5.0	140.4	48.3	Widen	
81	2022	RTE 81 RAMPS 1 & 2	ROUTE 81	243.4	1966	306	61.0			Demo	
	new	RTE 11 CONN - RTE 42 EBL	I-81	243.4				292.7	47.6	New	
	new	RTE 11 CONN - RTE 42 WBL	I-81	243.4				294.3	47.6	New	
	new	RTE 11 CONN - RTE 42 EBL	RTE 11	243.4				116.1	59.4	New	
	new	RTE 11 CONN - RTE 42 WBL	RTE 11	243.4				116.8	59.4	New	
679	6514	PLEASANT VALLEY RD	I-81	243.6	1959	223	32.5	266.7	42.7	Replace	
81	2003	NBL ROUTE 0081	CHW RAILWAY	244.4	1959	202	5.0	202.0	35.1	Widen	
81	2002	SBL ROUTE 0081	CHW RAILWAY	244.4	1959	202	5.0	202.0	35.1	Widen	
81	2001	ROUTE 81 NBL	BLACKS RUN	244.5	1959	132	5.0	129.3	46.3	Widen	
81	2000	ROUTE 81 SBL	BLACKS RUN	244.5	1959	132	5.0	129.3	46.3	Widen	
726	6515	STONE SPRING ROAD	I-81	245.0	1959	253	32.5	295.3	42.7	Replace	

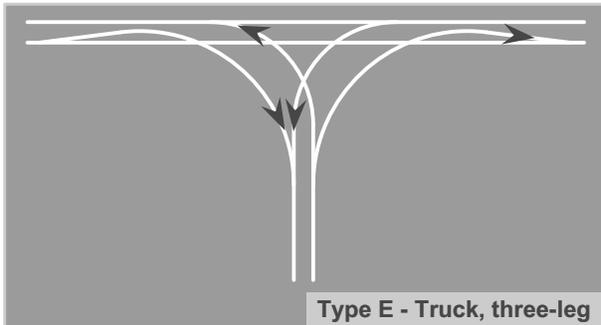
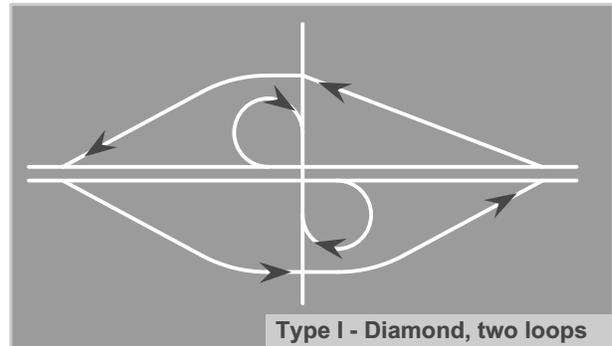
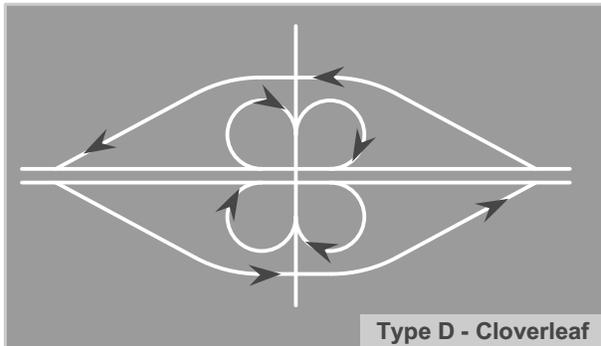
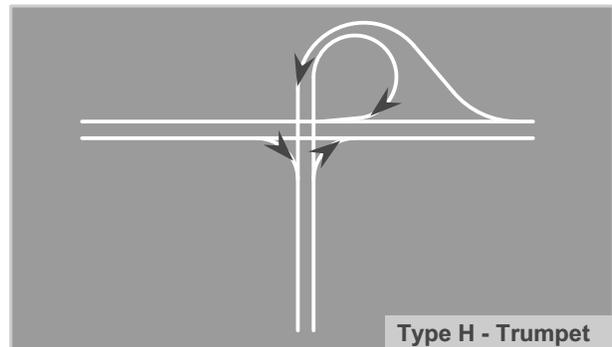
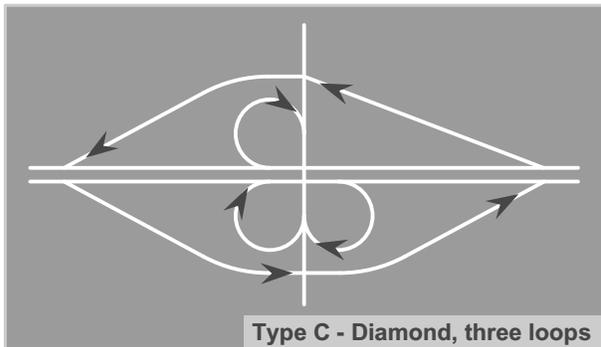
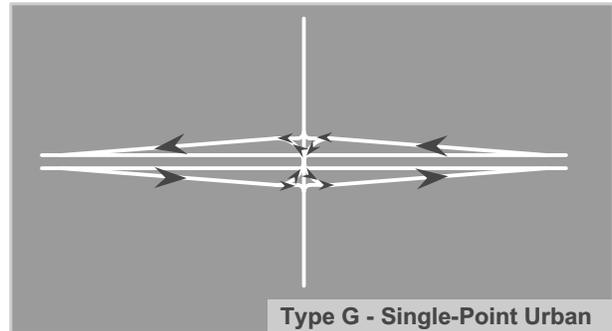
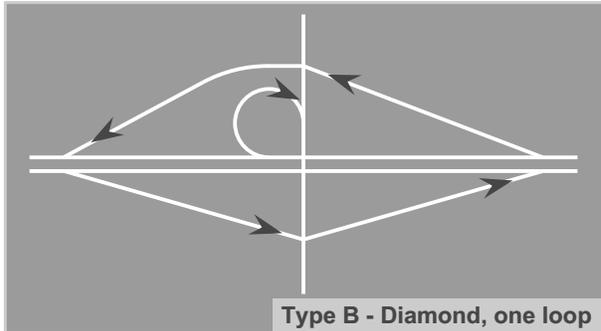
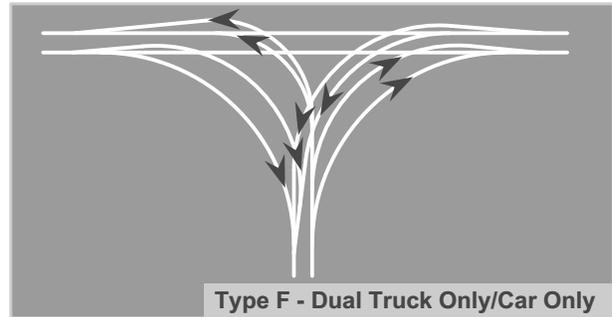
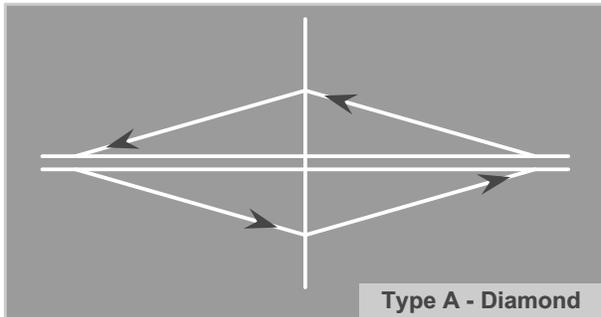
Detailed Proposal  
September 5, 2003

\* Width of bridge demolition for widening or replacement.

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
659	6517	PORT REPUBLIC ROAD	I-81	246.0	1960	275	73.0	333.7	107.3	Replace	
	new	JMU CONNECTOR	I-81	246.1				281.8	73.5	New	
331	1808	JMU-CARRIER DRIVE	I-81	246.7	1995	323	56.7			No Impact	
710	8001	RESERVOIR STREET	I-81	247.2	1999	395	61.0			No Impact	
33	1083	EBL ROUTE 0033	RTE 81	247.5	1960	245	46.0	803.8	77.1	Replace	SPUI
33	1082	WBL ROUTE 0033	RTE 81	247.5	1960	245	46.0	803.8	77.1	Replace	SPUI
	n/a	RTE 33 EBL \ WBL	I-81	247.5				229.7	109.9	New	
81	2901	I-81 NBL	CHW RAILWAY & CTY CB RD	247.8	1960	213	54.4	192.9	85.3	Replace	
81	2900	I-81 SBL	CHW RAILWAY & CTY CB RD	247.8	1960	213	54.4	192.9	85.3	Replace	
720	6519	SMITHLAND ROAD	I-81	248.9	1960	307	29.0	332.0	33.5	Replace	
81	2019	RAMP D 81 NBL OFF	ROUTE 81	252.1	1965	258	25.0	274.9	84.0	Replace	
81	2018	RAMP A NBL 81 ON	ROUTE 81	252.2	1965	257	25.0			Demo	
724	6554	ROUTE 724	I-81	252.3	1965	243	29.0	273.0	33.5	Replace	
721	6555	ROUTE 721	I-81	253.9	1965	302	29.0	328.7	33.5	Replace	
806	6556	ROUTE 806	I-81	255.7	1965	264	29.0	294.0	42.7	Replace	
11	1172	ROUTE 11	I-81	258.0	1965	375	35.0	328.7	42.7	Replace	
798	6557	ROUTE 798	I-81	259.1	1965	277	29.0	318.9	33.5	Replace	
796	6552	ROUTE 796	I-81	260.3	1965	346	29.0	345.1	33.5	Replace	
793	6553	ROUTE 793	I-81	261.9	1965	358	27.0	332.0	33.5	Replace	
81	2801	SBL ROUTE 0081	ROUTE 840	263.4	1965	128	44.0			No Impact	
81	2000	NBL ROUTE 0081	RTE 211	265.6	1965	202	44.0	196.9	85.3	Replace	
81	2001	SBL ROUTE 0081	RTE 211	265.9	1965	196	44.0	190.3	85.3	Replace	
767	6315	ROUTE 0767	RT 81	267.7	1965	327	29.0	354.3	46.6	Replace	
730	6326	ROUTE 0730	RTE I 81	269.0	1966	329	35.0	303.1	56.4	Replace	
81	2010	NBL ROUTE 0081	N FORK SHENANDOAH RIVER	269.3	1966	690	34.0	690.9	85.3	Replace	
81	2011	SBL ROUTE 0081	N FORK SHENANDOAH RIVER	269.6	1966	668	34.0	667.0	85.3	Replace	
720	6327	ROUTE 0720	RTE I 81	270.6	1966	316	29.0	319.9	33.5	Replace	
42	1068	ROUTE 0042	RTE I 81	271.0	1966	275	56.0	325.5	95.1	Replace	
81	2012	NBL ROUTE 0081	SOU RAILWAY	272.2	1966	250	35.0	240.5	85.3	Replace	
81	2013	SBL ROUTE 0081	SOU RAILWAY	272.4	1966	243	35.0	238.5	85.3	Replace	
81	2014	NBL ROUTE 0081	"MILL CK, RT 263 & RT 698"	272.9	1966	325	35.0	333.3	85.3	Replace	
81	2015	SBL ROUTE 0081	"MILL CK, RT 263 & RT 698"	273.1	1966	361	35.0	351.7	85.3	Replace	
292	6324	ROUTE 0292	RTE I 81	273.8	1966	386	35.0	381.2	80.1	Replace	
796	6325	ROUTE 0796	RT 81	274.6	1966	326	29.0	340.9	30.8	Replace	
707	6323	ROUTE 0707	RTE I 81	275.6	1966	354	29.0	351.0	30.8	Replace	
81	2020	NBL ROUTE 0081	RTE 614	278.2	1966	152	44.0	170.9	85.3	Replace	
81	2021	SBL ROUTE 0081	RTE 614	278.4	1966	174	44.0	176.5	85.3	Replace	
81	2026	ROUTE 0081	RAMP A O STONY CREEK	279.8	1966	231	32.0	232.0	85.3	Replace	
81	2022	NBL ROUTE 0081	RTE 185 & STONY CREEK	279.9	1966	436	35.0	455.7	85.3	Replace	
81	2027	ROUTE 0081	RAMP C O STONY CREEK	280.1	1966	209	32.0	223.1	85.3	Replace	
81	2023	SBL ROUTE 0081	RTE 185 & STONY CREEK	280.2	1966	443	35.0	456.4	85.3	Replace	
81	2024	NBL ROUTE 0081	NARROW PASSAGE CREEK	282.1	1966	348	35.0	335.0	85.3	Replace	

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
81	2025	SBL ROUTE 0081	NARROW PASSAGE CREEK	282.4	1966	343	35.0	337.3	85.3	Replace	
605	6330	ROUTE 0605	RTE I 81	282.5	1966	287	29.0	337.3	47.2	Replace	
816	6329	ROUTE 0816	RT 81	284.1	1966	289	32.7	352.7	33.5	Replace	
604	6328	ROUTE 0604	RTE I 81	284.9	1966	269	33.0	313.3	42.7	Replace	
81	2018	NBL ROUTE 0081	PUGHS RUN	287.2	1966	135	44.0	164.0	85.3	Replace	
81	2016	NBL ROUTE 0081	RTE 642 & DRY RUN	287.4	1966	148	44.0	180.4	85.3	Replace	
81	2019	SBL ROUTE 0081	PUGHS RUN	287.5	1966	135	44.0	164.0	85.3	Replace	
81	2017	SBL ROUTE 0081	RTE 642 & DRY RUN	287.6	1966	148	44.0	168.0	85.3	Replace	
81	2002	NBL ROUTE 0081	RTE 600	288.4	1965	112	44.0	128.3	85.3	Replace	
81	2003	SBL ROUTE 0081	RTE 600	288.7	1965	112	44.0	128.6	85.3	Replace	
81	2004	NBL ROUTE 0081	RTE 625	288.9	1965	110	44.0	124.3	85.3	Replace	
657	6316	ROUTE 0657	RTE I 81	289.0	1965	274	29.0	288.7	33.5	Replace	
81	2005	SBL ROUTE 0081	RTE 625	289.1	1965	110	44.0	138.8	85.3	Replace	
655	6317	ROUTE 0655	RTE I 81	289.9	1965	260	29.0	275.6	33.5	Replace	
653	6318	ROUTE 0653	RTE I 81	290.2	1965	259	29.0	280.8	30.8	Replace	
651	6319	ROUTE 0651	RTE I 81	291.3	1965	242	35.0	285.4	95.8	Replace	
646	6320	ROUTE 0646	RTE I 81	292.0	1965	289	29.0	304.8	33.5	Replace	
81	2006	NBL ROUTE 0081	RTE 601	294.2	1965	106	44.0	135.5	85.3	Replace	
81	2007	SBL ROUTE 0081	RTE 601	294.5	1965	106	44.0	131.9	85.3	Replace	
638	6321	ROUTE 0638	RTE I 81	295.5	1965	238	29.0	299.5	33.5	Replace	
55	1067	ROUTE 0055	RTE I 81	296.6	1965	393	35.0	453.4	106.6	Replace	
81	2008	NBL ROUTE 0081	B&O RAILROAD	298.2	1965	216	44.0	221.1	85.3	Replace	
81	2009	SBL ROUTE 0081	B&O RAILROAD	298.5	1965	216	44.0	219.2	85.3	Replace	
81	2900	NBL ROUTE 0081	CEDAR CREEK	299.7	1965	385	36.2	386.8	85.3	Replace	
81	2901	SBL ROUTE 0081	CEDAR CREEK	300.0	1965	385	36.2	386.8	85.3	Replace	
66	2028	WBL ROUTE 0066	RM 3 O EB RM 2 & NBL 81	300.5	1964	315	36.0	558.7	50.5	Replace	
81	2800	NBL ROUTE 0081	ROUTE 840	300.6	1965	128	44.0	141.1	85.3	Replace	
66	2029	EBL ROUTE 0066	RMP 2 O NBL RTE I 81	301.4	1964	170	42.0	413.4	50.5	Replace	
627	6167	ROUTE 0627	RTE I 81	302.4	1965	257	35.0	260.8	56.4	Replace	
735	6168	ROUTE 0735	RTE I 81	305.1	1965	257	29.0			No Impact	
277	1075	ROUTE 0277	RTE I 81	307.0	1963	220	48.2	269.0	98.4	Replace	
	new	ROUTE 0642	RTE I 81	308.0				393.7	42.7	New	
81	2000	NBL ROUTE 0081	OPEQUON CREEK	309.8	1963	139	5.0	138.8	46.3	Widen	
37	1115	SBL ROUTE 0037	RTE I 81	310.0	1977	250	42.0	354.3	42.7	Replace	
	new	SBL CD LANES	RTE I 81	310.0				354.3	42.7	New	
37	1040	NBL ROUTE 0037	RTE I 81	310.0	1964	249	35.0	354.3	42.7	Replace	
	new	NBL CD LANES	RTE I 81	310.0				354.3	42.7	New	
81	2001	SBL ROUTE 0081	OPEQUON CREEK	310.0	1963	139	5.0	138.8	46.3	Widen	
	new	RTE 0037	RTE 11	310.0				180.4	3.7	New	
	new	RTE 0037	RTE 11	310.0				180.4	3.7	New	
644	6160	ROUTE 0644	RTE I 81	312.0	1964	288	33.0	315.0	42.7	Replace	
11	1064	SBL ROUTE 0011	RTE I 81	313.5	1965	292	35.0			No Impact	Not included in study

Route	StrNo	Carrying	Over	MP	Bridge Built	Existing		Proposed		Action	Comments
						Length	Width *	Length	Width		
11	1065	NBL ROUTE 0011	RTE I 81	313.5	1965	292	35.0			No Impact	Not included in study
	new	AIRPORT ROAD	RTE I 81	313.5				246.1	42.7	New	
17	1078	ROUTE 0017	RTE I 81	313.7	1964	279	107.7	210.0	200.1	Replace	
81	2004	NBL ROUTE 0081	ABRAMS CREEK	314.0	1964	265	10.0	264.8	58.1	Widen	
81	2005	SBL ROUTE 0081	ABRAMS CREEK	314.0	1964	265	10.0	264.8	58.1	Widen	
657	6163	ROUTE 0657	RTE I 81	314.8	1964	249	33.0	275.6	39.4	Replace	
744	6162	ROUTE 0744	RTE I 81	315.0	1964	327	29.0	354.3	39.4	Replace	
7	1080	ROUTE 0007	RTE I 81	315.5	1964	307	94.2	213.3	170.6	Replace	
81	2006	NBL ROUTE 0081	RTE 11	317.8	1964	213	37.0	212.6	85.3	Replace	
	new	NBL CD LANES RTE 0081	RTE 11	317.8				212.6	29.5	New	
81	2007	SBL ROUTE 0081	RTE 11	317.8	1964	213	37.0	212.6	85.3	Replace	
	new	SBL CD LANES RTE 0081	RTE 11	317.8				212.6	29.5	New	
81	2008	NBL ROUTE 0081	CONRAIL	318.0	1964	191	5.0	191.0	38.3	Widen	
	new	NBL CD LANES RTE 0081	CONRAIL	318.0				191.0	46.6	New	
81	2009	SBL ROUTE 0081	CONRAIL	318.0	1964	191	5.0	191.0	38.3	Widen	
	new	SBL CD LANES RTE 0081	CONRAIL	318.0				191.0	32.8	New	
81	2002	NBL ROUTE 0081	B&O RAILROAD	318.1	1964	133	5.0	132.9	46.3	Widen	
81	2003	SBL ROUTE 0081	B&O RAILROAD	318.2	1964	133	5.0	132.9	46.3	Widen	
672	6164	ROUTE 0672	RTE I 81	321.5	1964	239	33.0	269.0	54.1	Replace	
671	6166	ROUTE 0671	RTE I 81	322.0	1964	258	29.0	298.6	42.7	Replace	
669	6165	ROUTE 0669	RTE I 81	323.8	1964	263	29.0	285.4	66.3	Replace	



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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
1		2	2		4			
		2	2		4			
3		2	2		4			
		2	2		4			
5		2	2		4			
		2	2		4			
7		2	2		4			Under Construction
		2	2		4			
		2	2		4			
		2	2		4			
10		2	2		4	A	A	Reconstruct Interchange and Rte. F-310 Bridge Replacement
11	Rte. 1717	2	2		4	N/A	N/A	Not included in proposal
		2	2		4			
13	Rte. 611	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement
14	Rte. 647/140	2	2		4	I	A	New Diamond Interchange & I-81 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
17	Rte. 75	2	2		4	A	G	Proposed SPUI & I-81 Bridge Replacement
		2	2		4			
19	Rte. 58	2	2		4	I	A	New Diamond Interchange, I-81 Bridge Replacement, Prop. 1/2 Truck Flyover Location
		2	2		4			
		2	2		4			
		2	2		4			
22	Rte. 704	2	2		4	I	I	Proposed Diamond -2 Loops & Rte. 704 Bridge Widening
		2	2		4			
24	Rte. 80	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement
		2	2		4			
26	Rte. 737	2	2		4	A	A	Reconstruct Interchange and Rte. 737 Bridge Replacement

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
		2	2		4			
		2	2		4			
29	Rte. 91	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement
		2	2		4			
		2	2		4			
32	Rte. 11	2	2		4	A	A	Reconstruct Interchange and Rte. 11 Bridge Replacement, Re-locate Rte. 11,
		2	2		4			F-033, and F-034
		2	2		4			
35	Rte. 11	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement, Re-locate Rte. 608, Rte. 762,
		2	2		4			and Rte. 107, Proposed Truck Flyover Location
		2	2		4			
		2	2		4			
39	Rte. 11	2	2		4	D	D	Reconstruct Interchange and Rte. 11 Bridge Replacement
		2	2		4			
		2	2		4			
42	Rte. 11	2	2		4	N/A	A	New Diamond Interchange & New Bridge
		2	2		4			
44	Rte. 11	2	2		4	A	N/A	Eliminate interchange and proposed Rte. 730 Bridge Replacement
45	Rte. 16	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement
		2	2		4			
47	Rte. 11	2	2		4	A	A	Re-locate Diamond Interchange and New 2-lane Bridge Over I-81
		2	2		4			and New 4-lane Bridge over Railroad
		2	2		4			
50	Rte. 622	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement, Re-locate F-011
		2	2		4			
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
		2	2		4			
54	Rte. 683	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement, Improve Ramp Geometrics
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
60	Rte. 90	2	2		4	A	A	Reconstruct Interchange and I-81 Bridge Replacement, Widen Rte. 90
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
66	Rte. 11	2	2		4	N/A	A	New Diamond Interchange & New Bridge over I-81 (per VDOT Study 2)
67	Rte. 11	2	2		4	D	N/A	Eliminate interchange and demolish existing ramps & underpass
		2	2		4			
		2	2		4			
70	Rte. 52/21	2	2		4	A	A	Reconstruct portions of Interchange and I-81 Bridge Replacement
		2	2		4			
72	I-77N	2	2		4			New Dual Truck Only/Car Only Interchange
73		2	2		4			Not in proposal
		2	2		4			
New	Wythe Co.	2	2		4			Allowance for interchange on new alignment (not shown on map)
		2	2		4			
77		2	2		4			Not in proposal
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
		2	2		4			
80		2	2		4			Not in proposal
81	I-77S	2	2		4			New Dual Truck Only/Car Only Interchange
		2	2		4			
		2	2		4			
84	Rte. 619	2	2		4	A	A	Reconstruct Interchange and Rte. 619 Bridge Replacement
		2	2		4			
86	Rte. 618	2	2		4	A	A	Reconstruct Interchange and New Rte. 618 Bridge
		2	2		4			
		2	2		4			
89	Rte 11/100	2	2		4	D	A	Eliminate Cloverleaf and reconstruct diamond interchange, I-81 Bridge Replacement
		2	2		4			
		2	2		4			
92	Rte 658	2	2		4	A	A	Reconstruct Interchange and F-047 Bridge Replacement
		2	2		4			
94	Rte 99	2	2		4	I	B	Eliminate loop in NE quad, I-81 Bridge Replacement
		2	2		4			
		2	2		4			
98	Rte. 100	2	2		4	A	I	Reconstruct Diamond Interchange, 2 new loops, I-81 Bridge Replacement
		2	2		4			
		2	2		4			
101	Rte. 660	2	2		4	A	A	Reconstruct Interchange and Rte. 660 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
105		2	2		4	D	D	Reconstruct partial cloverleaf, Rte. 232 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
109	Rte. 177	2	2		4	A	A	Reconstruct Interchange and Rte. 177 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
114	Rte. 8	2	2		4	A	B	Reconstruct interchange, 1 new loop, I-81 Bridge Replacement Proposed Truck Flyover Location
		2	2		4			
		2	2		4			
		2	2	2	6			
118	Rte. 460	2	2	2	6	C/D	C/D	Recently constructed
		2	2	2	6			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
128	Rte. 603	2	2		4	A	A	Reconstruct Diamond Interchange, I-81 Bridge Replacement over railroad and new Rte. 603 bridge
		2	2		4			
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
		2	2		4			
132	Rte. 647	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement, Proposed Truck Flyover location
		2	2		4			
		2	2		4			
		2	2		4			
137	Rte. 112	2	2	2	6	B	B	Reconstruct Interchange, I-81 Bridge Replacement, Proposed 2-lane CD roads
		2	2	2	6			
		2	2	2	6			
140	Rte. 311	2	2	2	6	B	B	Reconstruct Interchange, I-81 Bridge Replacement, Proposed 2-lane CD roads
141	Rte. 419	2	2	2	6	I	C	Reconstruct Diamond, Add one loop, Rte. 419 Bridge Replacement
		2	2	2	6			
143	I-581	2	2	2	6	D		Reconstruct Interchange, I-81 Bridge Replacement, Proposed 2-lane CD roads
		2	3		5			
		2	3		5			
146	Rte. 115	2	3		5	A	A	Reconstruct Interchange, New Rte. 115 Bridge
		2	3		5			
		2	3		5			
150	Rte. 220	2	3		5	D		New Dual Truck Only/Car Only Interchange (No cost for relocation of Rte. 11, only
		2	2		4			81/220 costs, No Truckstop relocation cost, Expensive R/W, and unique design)
		2	2		4			
		2	2		4			
		2	2		4			
156	Rte. 640	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement

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Figure A-6: Existing and Proposed Interchanges

		I-81 Mainlane NB & SB				Interchange Type		
		LOS C&D / YEAR 2025						
MP	Connection	Truck	Car	C/D	Total	Existing	Proposed	Comments
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
162	Rte. 11	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement, New Ramp Bridges
		2	2		4			over Mill Creek
		2	2		4			
		2	2		4			
		2	2		4			
167	Rte. 11	2	2		4	A	N/A	Eliminate interchange, Demo existing ramps
168	Rte. 614	2	2		4	A	A	Reconstruct Interchange, Rte. 614 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
175	Rte. 11	2	2		4	A	A	Reconstruct Interchange, Rte. 11 Bridge Replacement, Proposed Truck Flyover location
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
180	Rte. 11	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement
		2	2		4			
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
188	Rte. 60	2	2		4	D	A	Reconstruct Interchange, Rte. 60 Bridge Replacement
		2	2		4			
		2	2		4			
191	I-64W	2	2		4	E	E	New Dual Truck Only/Car Only Interchange
		2	2		4			
		2	2		4			
		2	2		4			
195	Rte. 11	2	2		4	A	A	Reconstruct Interchange, I-81 Widened Bridges over Rte. 11
		2	2		4			
		2	2		4			
		2	2		4			
200	Rte. 710	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
205	Rte. 606	2	2		4	A	F	New Dual Truck Only/Car Only Interchange
		2	2		4			
		2	2		4			
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
213	Rte. 11	2	2		4	B	B	Reconstruct Interchange, I-81 Bridge Widening
		2	2		4			
		2	2		4			
		2	2		4			
217	Rte. 654	2	2		4	A	A	Reconstruct Interchange, Rte. 654 Bridge Replacement
		2	2		4			
		2	2		4			
220		2	2	2	6			
221	I-64E	2	2	2	6			I-81 Bridge Widening, New Rte. 635 Bridge, New Rte. 64 Ramp Bridges over I-81
222		2	2	2	6			Replace I-81 Bridge over Railroad, Proposed 2-lane CD roads
		2	2		4			
		2	2		4			
225	Rte. 275	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Widening
		2	2		4			
227	Rte. 612	2	2		4	A	A	Reconstruct Interchange, Rte. 612 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

MP	Connection	I-81 Mainlane NB & SB				Interchange Type		Comments
		Truck	Car	C/D	Total	Existing	Proposed	
235	Rte. 256	2	2		4	A	A	Reconstruct Interchange, Rte. 256 Bridge Replacement, Proposed Truck
		2	2		4			Flyover location
		2	2		4			
		2	2		4			
240	Rte. 257	2	3		5	A	A	Reconstruct Interchange, No Rte. 257 Bridge Replacement
		2	3		5			
242	Rte. 11	2	3		5	N/A	A	New Diamond Interchange, New Ramp Bridges, New Rte. 42 Connector Bridge
								Rte. 988 Bridge, I-81 Bridge Widening
243	Rte. 11	2	3		5	PC	N/A	Eliminate cloverleaf interchange
		2	3		5			
245	Rte. 659	2	3		5	A	B	Reconstruct Interchange, Add 1 loop, Rte. 659 Bridge Replacement,
		2	3		5			
247	Rte. 33	2	3		5	D	G	New SPU Interchange, Rte. 33 Bridge Replacement
		2	3		5			
		2	3		5			
		2	3		5			
251		2	3		5	B	A	Reconstruct Interchange, Rte. 11 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
257	Rte. 11	2	2		4	A	A	Reconstruct Interchange, Rte. 11 Bridge Replacement
		2	2		4			
		2	2		4			

		I-81 Mainlane NB & SB				Interchange Type		
		LOS C&D / YEAR 2025						
MP	Connection	Truck	Car	C/D	Total	Existing	Proposed	Comments
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
264	Rte. 211	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
269	Rte. 730	2	2		4	A	A	Reconstruct Interchange, Rte. 730 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
273	Rte. 292/703	2	2		4	A	A	Reconstruct Interchange, Rte. 292 Bridge Replacement, Proposed Truck Flyover location
		2	2		4			Realign Rte. 318
		2	2		4			
		2	2		4			
277	Rte. 614	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement, Re-align Rte. 686
		2	2		4			
279	Rte. 185/675	2	2		4	A	A	Reconstruct Interchange, I-81 Bridge Replacement, Rte. 185 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
283	Rte. 42	2	2		4	A	A	Reconstruct Interchange, Rte. 42 Bridge Replacement
		2	2		4			
		2	2		4			

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Figure A-6: Existing and Proposed Interchanges

		I-81 Mainlane NB & SB				Interchange Type		
		LOS C&D / YEAR 2025						
MP	Connection	Truck	Car	C/D	Total	Existing	Proposed	Comments
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
291	Rte. 651	2	2		4	A	A	Reconstruct Interchange, Rte. 651 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			
		2	2		4			
296	Rte. 55	2	2		4	A	A	Reconstruct Interchange, Rte. 55 Bridge Replacement
		2	2		4			
298	Rte. 11	2	2		4	A	A	Reconstruct Interchange, Rte. 11 Bridge Replacement
		2	2		4			
300	I-66E	2	2		4	F	F	New Dual Truck Only/Car Only Interchange
		2	2		4			
302	Rte. 627	2	2		4	A	A	Reconstruct Interchange, Rte. 627 Bridge Replacement
		2	2		4			
		2	2		4			
		2	2		4			Northbound Flyover (Milepost 305)
		2	2		4			
307	Rte. 277	2	2		4	A	G	SPUI (Proposed as per VDOT design), Rte. 277 Bridge Replacement
		2	2		4			
		2	2		4			
310	Rte. 37S	2	3		5	A	D	Replace Diamond w/ New Cloverleaf Interchange, New Rte. 37 Bridge over I-81,
								Rte. 37 Bridge over CSX, Rte. 37 Bridge over Rte. 11

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Figure A-6: Existing and Proposed Interchanges

		I-81 Mainlane NB & SB				Interchange Type		
		LOS C&D / YEAR 2025						
MP	Connection	Truck	Car	C/D	Total	Existing	Proposed	Comments
		2	3		5			
		2	3		5			
313	Rte. 50/37	2	3		5	A	G	SPUI (Proposed as per VDOT design), Rte. 50 Bridge Replacement
	Winchester	2	3		5			
315	Rte. 7	2	3		5	D	G	Replace partial cloverleaf w/ SPUI (Proposed as per VDOT design),
		2	3		5			Rte. 7 Bridge Replacement
317	Rte. 11/37N	2	3		5	A	A	Reconstruct Interchange, I-81 Bridge Widening
		2	2		4			
		2	2		4			
		2	2		4			
321	Rte. 672	2	2		4	A	A	Reconstruct Interchange, Rte. 672 Bridge Replacement
		2	2		4			
323	Rte. 669	2	2		4	A	A	Reconstruct Interchange, Rte. 669 Bridge Replacement
		2	2		4			
	WV	2	2		4			

- Notation Legend:
- A - Diamond
  - B - Diamond, One Loop
  - C - Diamond, Three Loops
  - D - Cloverleaf
  - E - Truck, Three Leg
  - F - Dual Truck Only/Car Only
  - G - Single Point Urban
  - H - Trumpet
  - I - Diamond, 2 Loops

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Figure A-7: Proposed Number of Lanes  
and Location of Widening

AREA	BEGIN MP	END MP	LENGTH	PROPOSED NUMBER OF LANES	PROPOSED			SPLIT NB & SB
					INSIDE WIDENING	OUTSIDE WIDENING	INSIDE & OUTSIDE WIDENING	
1	8.3	8.64	0.34	8 lanes		X		
1	8.64	9.18	0.54	8 lanes		X		
1	9.18	9.72	0.54	8 lanes		X		X
1	9.72	10.27	0.55	8 lanes		X		
1	10.27	11.31	1.04	8 lanes		X		
1	11.31	11.83	0.52	8 lanes		X		
1	11.83	12.84	1.01	8 lanes		X		
1	12.84	13.3	0.46	8 lanes		X		
1	13.3	13.59	0.29	8 lanes		X		X
1	13.59	14.7	1.11	8 lanes		X		
1	14.7	15.26	0.56	8 lanes		X		X
1	15.26	16.35	1.09	8 lanes		X		
1	16.35	16.88	0.53	8 lanes		X		X
1	16.88	17.4	0.52	8 lanes		X		
1	17.4	17.88	0.48	8 lanes		X		
1	17.88	18.9	1.02	8 lanes		X		
1	18.9	19.44	0.54	8 lanes		X		
1	19.44	19.97	0.53	8 lanes		X		
1	19.97	21.05	1.08	8 lanes		X		
1	21.05	21.59	0.54	8 lanes		X		
1	22.59	22.65	0.06	8 lanes		X		
1	22.65	23.4	0.75	8 lanes		X		
<b>TOTAL MILEAGE FOR AREA #1</b>			<b>11.09</b>					
2	23.4	35	11.6	8 lanes	X			
2	35	40	5	8 lanes	X			
2	40	42	2	8 lanes	X			
2	42	45.8	3.8	8 lanes	X			
2	45.8	46.2	0.4	8 lanes	X			
2	46.2	48.9	2.7	8 lanes	X			
2	48.9	49.2	0.3	8 lanes	X			
2	49.2	50.1	0.9	8 lanes	X			
2	50.1	50.5	0.4	8 lanes	X			
2	50.5	52.6	2.1	8 lanes	X			
2	52.6	53.6	1	8 lanes	X			
2	53.6	59	5.4	8 lanes	X			
2	59	60.5	1.5	8 lanes	X			
2	60.5	61.1	0.6	8 lanes	X			
2	61.1	63	1.9	8 lanes	X			
2	63	69	6	8 lanes	X			
2	69	71.8	2.8	8 lanes	X			
<b>TOTAL MILEAGE FOR AREA #2</b>			<b>48.4</b>					
3	71.8	73.1	1.3	8 lanes	X			
3	73.1	73.5	0.4	8 lanes	X			
3	73.5	74.7	1.2	8 lanes	X			
3	74.7	79	4.3	8 lanes	X			
3	79	79.5	0.5	8 lanes	X			
3	79.5	80.8	1.3	8 lanes	X			
3	80.8	81.4	0.6	8 lanes	X			
3	81.4	83	1.6	8 lanes	X			
<b>TOTAL MILEAGE FOR AREA #3</b>			<b>11.2</b>					

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Figure A-7: Proposed Number of Lanes  
and Location of Widening

AREA	BEGIN MP	END MP	LENGTH	PROPOSED NUMBER OF LANES	PROPOSED			SPLIT NB & SB
					INSIDE WIDENING	OUTSIDE WIDENING	INSIDE & OUTSIDE WIDENING	
4	83	84.9	1.9	8 lanes	X			
4	84.9	85.1	0.2	8 lanes	X			
4	85.1	85.5	0.4	8 lanes	X			
4	85.5	85.8	0.3	8 lanes	X			
4	85.8	88.2	2.4	8 lanes	X			
4	88.2	88.5	0.3	8 lanes	X			
4	88.5	90.4	1.9	8 lanes	X			
4	90.4	90.7	0.3	8 lanes	X			
4	90.7	92.6	1.9	8 lanes	X			
4	92.6	92.9	0.3	8 lanes	X			
4	92.9	93.4	0.5	8 lanes	X			
4	93.4	93.7	0.3	8 lanes	X			
4	93.7	94.1	0.4	8 lanes	X			
4	94.1	94.5	0.4	8 lanes	X			
4	94.5	95.4	0.9	8 lanes	X			
4	95.4	95.7	0.3	8 lanes	X			
4	95.7	96.1	0.4	8 lanes	X			
4	96.1	96.5	0.4	8 lanes	X			
4	96.5	97.1	0.6	8 lanes	X			
4	97.1	97.5	0.4	8 lanes	X			
4	97.5	97.8	0.3	8 lanes	X			
4	97.8	98	0.2	8 lanes	X			
4	98	98.6	0.6	8 lanes	X			
4	98.6	98.9	0.3	8 lanes	X			
4	98.9	101.5	2.6	8 lanes	X			
4	101.5	102.6	1.1	8 lanes	X			
4	102.6	103.4	0.8	8 lanes	X			
4	103.4	103.7	0.3	8 lanes	X			
4	103.7	104.1	0.4	8 lanes	X			
4	104.1	104.5	0.4	8 lanes	X			
4	104.5	105.8	1.3	8 lanes	X			
4	105.8	106	0.2	8 lanes	X			
4	106	106.5	0.5	8 lanes	X			
4	106.5	106.7	0.2	8 lanes	X			
4	106.7	107.3	0.6	8 lanes	X			
4	107.3	107.6	0.3	8 lanes	X			
4	107.6	108	0.4	8 lanes	X			
4	108	108.4	0.4	8 lanes	X			
4	108.4	108.8	0.4	8 lanes	X			
4	108.8	109.1	0.3	8 lanes	X			
4	109.1	109.7	0.6	8 lanes	X			
4	109.7	113.6	3.9	8 lanes	X			
4	113.6	114.8	1.2	8 lanes	X			
4	114.8	116	1.2	8 lanes	X			
4	116	116.2	0.2	8 lanes	X			
<b>TOTAL MILEAGE FOR AREA #4</b>			<b>33.2</b>					
5	118.8	119.5	0.7	12 lanes		X		
5	119.5	120.6	1.1	8 lanes		X		
5	120.8	121.7	0.9	8 lanes		X		
5	121.7	122	0.3	8 lanes		X		
5	122	122.1	0.1	8 lanes		X		
5	122.1	122.3	0.2	8 lanes		X		

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Figure A-7: Proposed Number of Lanes  
and Location of Widening

AREA	BEGIN MP	END MP	LENGTH	PROPOSED NUMBER OF LANES	PROPOSED			SPLIT NB & SB
					INSIDE WIDENING	OUTSIDE WIDENING	INSIDE & OUTSIDE WIDENING	
5	122.3	122.5	0.2	8 lanes		X		
5	122.5	122.6	0.1	8 lanes		X		
5	122.6	123	0.4	8 lanes			X	X
5	123	123.2	0.2	8 lanes			X	X
5	123.2	124	0.8	8 lanes			X	
5	124	125	1	8 lanes			X	
5	125	125.2	0.2	8 lanes			X	
5	125.2	126.1	0.9	8 lanes		X		
5	126.1	127.8	1.7	8 lanes		X		
5	127.8	128.5	0.7	8 lanes		X		X
5	128.5	129.2	0.7	8 lanes		X		
5	129.2	130.5	1.3	8 lanes		X		
5	130.5	131.6	1.1	8 lanes		X		
5	131.6	134	2.4	8 lanes		X		
5	134	134.3	0.3	8 lanes		X		X
5	134.3	134.7	0.4	8 lanes		X		X
5	134.7	135.3	0.6	8 lanes		X		
5	135.3	136.8	1.5	8 lanes		X		
5	136.8	137.6	0.8	8 lanes		X		X
5	137.6	137.9	0.3	12 lanes		X		X
5	137.9	138.6	0.7	12 lanes		X		
5	138.6	138.9	0.3	12 lanes		X		
5	138.9	142	3.1	12 lanes		X		
5	142	143.4	1.4	12 lanes		X		
5	143.4	143.6	0.2	12 lanes		X		
5	143.6	144	0.4	12 lanes		X		
5	144	144.1	0.1	10 lanes		X		
5	144.1	144.3	0.2	10 lanes		X		
5	144.3	144.4	0.1	10 lanes		X		X
5	144.4	144.7	0.3	10 lanes		X		X
5	144.7	145.5	0.8	10 lanes		X		X
5	145.5	147.3	1.8	10 lanes		X		X
5	147.3	148.8	1.5	10 lanes		X		
5	148.8	149	0.2	10 lanes		X		X
5	149	149.6	0.6	10 lanes		X		X
5	149.6	150.3	0.7	10 lanes			X	
5	150.3	150.8	0.5	10 lanes			X	
5	150.8	152.2	1.4	8 lanes			X	
5	152.2	153	0.8	8 lanes			X	
5	153	154.3	1.3	8 lanes			X	
5	154.3	155.3	1	8 lanes			X	
5	155.3	156.4	1.1	8 lanes			X	
5	156.4	158	1.6	8 lanes			X	
5	158	158.1	0.1	8 lanes			X	X
5	158.1	159.2	1.1	8 lanes			X	
5	159.2	159.4	0.2	8 lanes			X	X
5	159.4	160.3	0.9	8 lanes			X	
5	160.3	161.1	0.8	8 lanes			X	
5	161.1	161.3	0.2	8 lanes			X	
5	161.3	162.8	1.5	8 lanes			X	X
5	162.8	163	0.2	8 lanes			X	
<b>TOTAL MILEAGE FOR AREA #5</b>			<b>44</b>					

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Figure A-7: Proposed Number of Lanes  
and Location of Widening

AREA	BEGIN MP	END MP	LENGTH	PROPOSED NUMBER OF LANES	PROPOSED			SPLIT NB & SB
					INSIDE WIDENING	OUTSIDE WIDENING	INSIDE & OUTSIDE WIDENING	
6	163.25	163.5	0.25	8 lanes			X	X
6	163.5	164.5	1	8 lanes			X	
6	164.5	165.7	1.2	8 lanes			X	
6	165.7	166	0.3	8 lanes			X	
6	166	166.5	0.5	8 lanes			X	X
6	166.5	167.2	0.7	8 lanes			X	
6	167.2	167.5	0.3	8 lanes			X	
6	167.5	168.5	1	8 lanes			X	
6	168.5	169.1	0.6	8 lanes			X	
6	169.1	170.6	1.5	8 lanes			X	
6	170.6	171.2	0.6	8 lanes			X	
6	171.2	171.9	0.7	8 lanes			X	
6	171.9	173.2	1.3	8 lanes			X	
6	173.2	174	0.8	8 lanes			X	X
6	174	175.3	1.3	8 lanes			X	X
6	175.3	175.8	0.5	8 lanes			X	
6	175.8	176.5	0.7	8 lanes			X	
6	176.5	178.7	2.2	8 lanes			X	X
6	178.7	180	1.3	8 lanes			X	
<b>TOTAL MILEAGE FOR AREA #6</b>			<b>16.75</b>					
7	180	182	2	8 lanes	X			
7	182	184	2	8 lanes	X			
7	184	184.2	0.2	8 lanes	X			
7	184.2	186.1	1.9	8 lanes	X			
7	186.1	186.8	0.7	8 lanes	X			
7	186.8	187.6	0.8	8 lanes	X			
7	187.6	188.1	0.5	8 lanes	X			
7	188.1	189	0.9	8 lanes	X			
7	189	189.9	0.9	8 lanes	X			
7	189.9	190.2	0.3	8 lanes	X			
7	190.2	190.7	0.5	8 lanes	X			
7	190.7	192	1.3	8 lanes	X			
7	192	195.2	3.2	8 lanes	X			
7	195.2	200	4.8	8 lanes	X			
7	200	201.1	1.1	8 lanes	X			
7	201.1	202.1	1	8 lanes	X			
7	202.1	202.5	0.4	8 lanes	X			
7	202.5	206.7	4.2	8 lanes	X			
7	206.7	207.2	0.5	8 lanes	X			
7	207.2	219.7	12.5	8 lanes	X			
7	219.7	222.1	2.4	12 lanes	X			
7	222.1	222.4	0.3	12 lanes	X			
7	222.4	223.3	0.9	12 lanes	X			
7	223.3	224.1	0.8	8 lanes	X			
7	224.1	224.4	0.3	8 lanes	X			
7	224.4	225	0.6	8 lanes	X			
7	225	229	4	8 lanes	X			
<b>TOTAL MILEAGE FOR AREA #7</b>			<b>49</b>					
8	228.9	234.6	5.7	8 lanes	X			
8	234.6	236.4	1.8	8 lanes	X			
8	236.4	236.5	0.1	8 lanes	X			

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Figure A-7: Proposed Number of Lanes  
and Location of Widening

AREA	BEGIN MP	END MP	LENGTH	PROPOSED NUMBER OF LANES	PROPOSED			SPLIT NB & SB
					INSIDE WIDENING	OUTSIDE WIDENING	INSIDE & OUTSIDE WIDENING	
8	236.5	237.5	1	8 lanes	X			
8	237.5	240.6	3.1	8 lanes	X			
8	240.6	242.1	1.5	10 lanes	X			
8	242.1	243.5	1.4	10 lanes	X			
8	242.1	242.8	0.7	10 lanes	X			
8	242.8	247.8	5	10 lanes	X			
8	243.5	247.8	4.3	10 lanes	X			
8	247.8	250.8	3	10 lanes	X			
8	250.8	251.7	0.9	10 lanes	X			
8	251.7	261.6	9.9	8 lanes	X			
8	261.6	262.6	1	8 lanes	X			
8	262.6	264	1.4	8 lanes	X			
<b>TOTAL MILEAGE FOR AREA #8</b>			<b>40.8</b>					
9	263.9	268.1	4.2	8 lanes	X			
9	268.1	282.2	14.1	8 lanes	X			
9	282.2	286.1	3.9	8 lanes	X			
9	286.1	290	3.9	8 lanes	X			
9	290	292.4	2.4	8 lanes	X			
9	292.4	292.7	0.3	8 lanes	X			
9	292.7	293	0.3	8 lanes	X			
9	293	298.8	5.8	8 lanes	X			
9	298.8	299.7	0.9	8 lanes	X			
9	299.7	300	0.3	8 lanes	X			
9	300	300.1	0.1	8 lanes	X			
9	301.1	302	0.9	8 lanes	X			
9	302	303	1	8 lanes	X			
9	303	304.5	1.5	8 lanes	X			
9	304.5	305	0.5	8 lanes	X			
<b>TOTAL MILEAGE FOR AREA #9</b>			<b>40.1</b>					
10	305	306.8	1.8	8 lanes	X			
10	306.8	308	1.2	8 lanes	X			
10	308	309.3	1.3	8 lanes	X			
10	309.3	310.9	1.6	8 lanes	X			
10	310.9	311.8	0.9	10 lanes	X			
10	311.8	316	4.2	10 lanes	X			
10	316	317	1	10 lanes	X			
10	317	319.6	2.6	10 lanes	X			
10	319.6	320.5	0.9	8 lanes	X			
10	320.5	324	3.5	8 lanes	X			
10	324	324.2	0.2	8 lanes	X			
<b>TOTAL MILEAGE FOR AREA #10</b>			<b>19.2</b>					
<b>TOTAL MILEAGE FOR AREA'S 1-10</b>			<b>313.74</b>					



## Tab B Positive Separation

***An explanation of how the proposer plans to provide positive separation between opposing directions of traffic in areas where the required minimum separation will not be maintained. Include a description of locations where this situation is anticipated.***

---

Positive separation between opposing directions will be provided on STAR Solutions' proposed design using a median barrier throughout the majority of the roadway. On sections where there is a significant grade differential between opposing lanes, guardrails or barriers will be used to keep opposing traffic within their area. Although the preferred alternative selected through the NEPA process may adjust the typical section, our plan does not have any median width greater than 40 feet.

## Tab C Design Exceptions

***The viability of a proposal without any design exceptions or how the proposing team plans to justify any design exceptions that will be required.***

---

During the conceptual design effort, STAR Solutions reviewed the study prepared by VDOT for the I-81 project and completed a field investigation of the entire length of the project. This effort uncovered numerous instances when the design of the existing highway does not meet the design guidelines of the current AASHTO *Green Book*. Most of the deficiencies relate to shoulder width, bridge width, vertical clearance, structural capacity, horizontal and vertical alignment, grade, stopping sight distance and super elevation.

Although the existing highway does not meet the current design guidelines for geometric design, it is not necessarily unsafe. However, if major reconstruction work such as the highway improvements planned for I-81 by VDOT is going to take place, it will be desirable to complete the work with a minimum of design exceptions.

The STAR Solutions team proposes to complete a comprehensive study of the geometric design and bridge design of the existing highway by reviewing the "as-built plans" and pertinent existing information as well as completing a field inspection. The study will attempt to identify the major design issues requiring corrective work to meet current design guidelines. These design issues will be grouped by type (shoulder width, bridge width, etc.) and will be identified by location and magnitude of deviation from design guidelines. A record and history of accidents that occurred along the project will also be compiled. This historical information will be used to support a request for design exceptions if needed.

Because of the length of the I-81 project, the STAR Solutions team proposes to deal with deviations from current design guidelines in a global way. In the areas where it is determined that the existing pavement is in good condition and the roadway could be widened to meet the proposed typical section, an attempt will be made to accept the existing geometric design and request a design exception for minor deviations.

For areas where a major deviation from current design guidelines exists, STAR Solutions will recommend retrofitting, total reconstruction or, in the case of bridges, replacement. In the areas where the existing pavement requires replacement or total reconstruction, we will evaluate the feasibility of meeting current design guidelines and avoid requesting a design exception. This proposed evaluation will include looking at and estimating the cost of several alternatives that meet the design guidelines and coordinating with VDOT to make the final decision.

## Tab D Existing Pavement

***An explanation of what steps the proposal includes to address the condition of the existing pavement along the corridor.***

---

The STAR Solutions team has anticipated utilizing 30 percent of the existing pavement in the final proposed project scope and cost, based on an initial evaluation of the following:

- Existing or recently completed (within the last five years) roadway enhancements, including widening, reconstruction and/or rehabilitation projects, such as the recently-constructed area around Christiansburg
- Near-future rehabilitation projects (i.e. overlays or mill/inlay type projects) in rural areas with lesser traffic demands as compared to critical urban areas (e.g. Roanoke urban area)
- Areas where the width between the northbound and southbound roadways is adequate to allow for independent grading and construction of truck-only lanes and median barriers
- Initial visual assessment of the corridor with overall identification of pavement condition, including structural and functional distresses
- Published documentation of previous evaluations carried out utilizing non-destructive methods such as ground penetrating radar (GPR) and falling weight deflectometer (FWD)

In the context of this Detailed Proposal, VDOT's responsibility will be to maintain existing I-81 sections during the construction process as well as to provide the required enhancements to the 30 percent not affected by our construction to meet the future engineering demands of the facility.

## Tab E Rail Improvements

***A plan of proposed rail improvements clearly indicating which improvements are included in this proposal, and which are included for discussion only.***

The STAR Solutions team believes that moving cargo from I-81 to rail is an important component of a multimodal approach to solving the problems of safety and congestion in the corridor. For the past year, we have explored various options to address this goal, and we have included certain components in our proposal, which are outlined below.

The issues of upgrading the rail infrastructure in Virginia are complex and potentially costly. We have outlined a two-phase initiative to upgrade the Norfolk Southern (NS) tracks in northern Virginia and the northern Shenandoah Valley, which we believe will increase rail freight and passenger rail opportunities. Additional improvements in this region, along with improvements in Maryland, West Virginia and Pennsylvania, will be needed to facilitate additional cargo diversions to rail. These improvements would be part of a larger plan to provide a viable route from Meridian, Mississippi, to Harrisburg, Pennsylvania. NS sees a need for a double-tracked facility with some locations triple-tracked. The improvements would be implemented over time. Since one of the biggest bottlenecks (and the one segment anticipated to be the most difficult to accomplish) is the line segment between Manassas and Riverton Junction to Harrisonburg, Pennsylvania, we have focused our recommendations on that part of the network.

Included in Tab R is a financing plan to accomplish Phase 1 of our plan, since those improvements are exclusively within Virginia and are under the purview of the PPTA. Phase 2 is included for discussion purposes only and will require coordination with neighboring states to accomplish. Based on our conversations with NS, the railroad would be open to some form of public-private funding approach. An example is the recent agreement that NS entered into with the State of Delaware to rehabilitate the Shellpot Bridge over the Christiana River in Wilmington. The \$13 million project will be funded by Delaware and NS will pay the state a fee on a carload basis over a 20-year period.

### **Phase 1 – Up to 560,000 Trucks Diverted: Capital Cost of \$111 Million**

This phase is composed of two parts. The initial component is expansion of railroad track capacity and signaling upgrades between Manassas and Haymarket and then from Marshall to Front Royal. These improvements will not only add additional capacity to facilitate freight rail movements, but it will also accommodate the Virginia Railway Express (VRE) commuter service between Manassas and Haymarket. The expansion of the VRE service from its current terminus at Manassas to Haymarket will support continued residential growth in western Prince William County, and relieve traffic on I-66 and other state roads in the area.

The estimated cost of the improvements is \$55 million and includes:

- Addition of a secondary line south of Manassas for staging trains entering or leaving the area where the commuter service is in operation
- Grade for a third main line between Manassas and Haymarket to permit future commuter service
- 10 miles of double track and signaling between Manassas and Haymarket
- Additional sidings between Marshall and Front Royal to be used for the movement and staging of freight trains. Also additional signaling in these areas



***A plan of proposed rail improvements clearly indicating which improvements are included in this proposal, and which are included for discussion only.***

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To further be able to accept the new diversion of freight traffic and to ensure that the VRE service is not affected, NS needs additional track capacity north of Riverton Junction (near Front Royal) to feed rail traffic to the main line towards Harrisburg, Pennsylvania.

The estimated cost of the improvements is \$56 million and includes:

- Adding a new double track
- New universal crossovers
- Capacity improvements

Because of current capacity constraints along the NS network from Manassas to north of Riverton Junction, rail is unable to compete with trucks in moving cargo into and out of the Washington, D.C. market. As a result, trucks now carry most of that cargo and utilize I-66 and I-81. We believe these improvements to the NS line could result in making rail more competitive and allow for diverting up to 560,000 truckloads to rail each year.

These improvements would also further enhance the competitive position of the Virginia Inland Port.

If the diversion of trucks from I-81 to rail increases above 560,000, then additional monies would need to be invested in the NS line in the region. This Phase 2 investment, accounting for inflation and engineering, would be approximately \$250 million in addition to the Phase 1 investment of \$111 million.

**Phase 2 – 560,000 to 1.4 Million Trucks Diverted: Capital Cost of \$250 Million**

Phase 2 of the proposal adds capacity necessary to accommodate in excess of 560,000 truckloads. This work would consist principally of extra double tracking, along with appropriate train control measures. The second phase should permit the movement of up to 1.4 million units.

- \$82 million—Riverton to Manassas for additional track, track rehabilitation and signaling
- \$59 million from Riverton to Virginia/West Virginia line, which includes partial double track, line and curve adjustment, bridge improvements and connection track.
- \$109 million for additional improvements from Harrisburg to the Virginia/West Virginia Line, including additional double track, line rehabilitation, bridges, and changes at Hagerstown yard

We have not included a financing plan for this phase since many of the improvements occur outside of Virginia and would require discussions with other states.

**Other Rail Proposals—Discussion**

Most experts agree that for rail to be competitive with trucks, cargo must move in excess of 500 miles. I-81 through Virginia is only 325 miles. Therefore, any serious plan to effectively implement a multimodal solution requires cooperation with neighboring states and an examination of all alternative routes.

Both NS and CSX have rail routes that move cargo from the Southeast to the Northeast. The NS lines—one paralleling I-81 and the other along U.S. 29—have been the focus of most discussions. CSX's lines run parallel to I-95 and also offer the potential to facilitate cargo diversion over longer routes. As outlined above, our discussions with NS have shown that modest improvements made within the Commonwealth could result in diversions of cargo now carried by

***A plan of proposed rail improvements clearly indicating which improvements are included in this proposal, and which are included for discussion only.***

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trucks on I-81 to rail. Our conversations with CSX representatives have shown that similar improvements may be needed in its network, but those improvements would be outside of Virginia.

NS has been promoting for several years the development of the intermodal business along the I-81 corridor. Most of the discussion has been about improvements of the line running parallel to I-81. This route was the former Conrail route from Harrisburg, Pennsylvania, to Hagerstown, Maryland, and former Norfolk and Western route from Hagerstown to Bristol, Tennessee, connecting with a former Southern Railway line to Chattanooga. The costs to develop this route were estimated by NS in 1999 to be \$2.3 billion and includes improved track alignments and needed additional track capacity with double-track sections and reverse signaling.

NS has another north-south main track running parallel to U.S. Route 29 on the former Norfolk and Western route, which is the former Southern Railway main track running from Washington, DC, to Atlanta, Georgia. This line is the rail carrier's existing intermodal route (with double-stack capacity) for traffic moving between the Southeast and Northeast and would likely require less funding to improve.

The Virginia Department of Rail and Public Transportation is currently working on an origination and destination study of cargo in the I-81 and I-95 corridors to more fully assess the opportunity to divert cargo from trucks to rail. This analysis, being conducted by Reebie Associates, should be completed this year, and builds on the work performed by the department three years ago as part of the SJR 55 study. That analysis showed that the potential does exist to shift cargo to rail, but that the potential diversion would be no greater than 10-25 percent of the anticipated growth in cargo. As a result, that study concluded that rail, while an important part of the ultimate solution for improving safety and reducing congestion along I-81, does not replace the need to widen I-81. Although many rail advocates in the I-81 corridor believe that a rail-only solution can solve these problems, the facts do not support that conclusion. Instead, both alternatives should be pursued.

The current Reebie study is expected to show a potential diversion rate of approximately 20 percent with a combination of both traditional long-haul traffic and non-traditional, short-haul traffic using a new intermodal concept, such as the one used in Canadian Pacific's Expressway. The latter technology requires much smaller, simpler and thus easier-to-develop terminals. Most of the diversion (80 percent) is expected to move in trailers rather than containers, another favorable factor for implementation of Expressway technology.

To implement this plan, improvement to the NS route, which contemplates cargo flows from Mexico and Texas through New Orleans and Meridian, Mississippi; and a new route from Memphis through Knoxville and Roanoke to connect with the route from New Orleans at Lynchburg would be necessary. It would also require the construction of intermodal terminals in Roanoke and Knoxville. This new route could also open up additional intermodal opportunities along the route being promoted by developers such as Progress Park at the intersection of I-81 and I-77.

Rail improvements to the NS track running parallel to I-81 could also support the development of additional passenger rail facilities, including the TransDominion Express.

It should be noted, however, that the actual percent of diversion is dependent on commitments by NS and other national carriers to provide the system-wide improvements, which will address the needs of the customers. Improvements to accommodate diversions from I-81 cannot be addressed in Virginia alone. It must be accomplished through cooperation and coordination,



***A plan of proposed rail improvements clearly indicating which improvements are included in this proposal, and which are included for discussion only.***

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including financial support from other states and the Federal Government (i.e. FRA, FHWA, etc.). Therefore, while STAR Solutions supports these efforts, we have not developed a cost estimate or financing plan for them. Upon completion of the Reebie analysis, we would be eager to meet with representatives of VDOT, DRPT, NS and CSX to discuss the next steps.

**Future Rail Improvements—Design Considerations**

In addition to actual improvements to the rail infrastructure, the STAR Solutions team is committed to working with all interested parties to ensure that our road and bridge design is compatible with potential future rail improvements throughout the corridor. For example, I-81 crosses the NS line several times as it passes through Virginia. Any bridge structures should be designed to facilitate the later addition of track along that route.

Our proposed roadway design, which includes at least two dedicated lanes for commercial trucks, also provides for the opportunity to convert one of the lanes to an intermodal facility similar to the future plans contemplated for the Third Crossing in Hampton Roads. That plan calls for the construction of additional lanes for cars, but converting the lanes to mass transit or cargo-dedicated lanes in the future if justified by cargo traffic growth. Clearly, the results of the Reebie analysis and additional study will drive this decision-making process.

## Tab F Sound Barrier

***An estimate of anticipated sound barrier wall needs for the proposed project. Include the methodology and reasoning used to develop the estimate.***

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STAR Solutions anticipates that approximately 53,730 meters (in length) of new sound barriers will be sufficient to protect sensitive areas in the corridor. Our estimate for constructing the noise barriers required by the FHWA and VDOT's *Noise Abatement Policy* criteria in conjunction with the proposed I-81 improvements from Exit 7 to the West Virginia state line is \$84.5 million.

The estimates have been developed based on areas of the state using the ten I-81 Corridor Study Books and are broken down by area in Figure F-1. Areas of high residential development and other noise-sensitive properties such as churches, schools, parks and recreation areas adjacent to I-81 have been identified in the Study Books, and barrier lengths have been estimated for each location.

In calculating the estimate, an average barrier height of 6.1 meters or 20 feet was used and is based on previous VDOT experience with barriers on interstates in Virginia such as I-95 and I-81 that carry high volumes of three or more axle trucks. The estimates include only the costs of barriers likely to be cost effective in accordance with VDOT's *Noise Abatement Policy*. A cost-effective barrier must cost no more than \$30,000 per protected or benefited residential property with each protected (impacted) property and each benefited (non-impacted) property receiving a minimum of five decibels of noise reduction. Barrier cost effectiveness for noise-sensitive properties other than residential are based on a case-by-case basis.

The estimates do not include the cost of existing I-81 barriers that may have to be replaced or relocated as a result of the proposed design. They also do not include the cost of third-party barriers—non cost-effective barriers that can still be constructed if a third party funds the amount above VDOT's ceiling. If the costs of all existing and non cost-effective barriers were included, the estimates would be significantly higher.



*An estimate of anticipated sound barrier wall needs for the proposed project. Include the methodology and reasoning used to develop the estimate.*

Figure F-1: Cost Estimates for Noise Barriers by Area

BOOK	MILEPOST	LENGTH (meters)	HEIGHT (meters)	AREA (sq meters)
1	7 - 22	5,060	6.1	30,866
2	22 - 72	9,540	6.1	58,194
3	72 - 83	960	6.1	5,856
4	83 - 116	9,000	6.1	54,900
5	118 - 163	10,370	6.1	63,257
6	163 - 180	0	0	0
7	180 - 229	1,260	6.1	7,686
8	229 - 264	5,530	6.1	33,733
9	264 - 305	4,860	6.1	29,646
10	305 - 324	7,150	6.1	43,615
<b>TOTAL</b>		<b>53,730</b>		<b>327,753</b>
<b>NOTES:</b>	<p><b>HEIGHT:</b> an average height of 6.1 meters (or 20 feet) was used for all estimates.</p> <p><b>TOTALs</b> represent only barriers likely to be cost-effective in accordance with VDOT's <i>Noise Abatement Policy</i> and do <u>not</u> represent existing I-81 barriers that may have to be replaced or relocated as a result of the proposed design or non cost-effective barriers.</p>			



## Tab G Public Utilities

***An indexed listing of public utility facilities that will be crossed by the transportation facility and a statement of the proposer's plans to accommodate such utility facility.***

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The STAR Solutions team has identified more than 50 utility owners who have approximately 323 facilities located along or crossing the I-81 corridor. Figure G-1 identifies the utility owners known at this time and the general location of these facilities.

Our proposed design and construction will affect many of these utility facilities and will require either protection or relocation. Because of the limited design details available at this time, the proposed action for each is not yet known. As part of the project development engineering, STAR Solutions will closely coordinate the roadway design considering the impacts on utility facilities.

Included in the survey phase will be the identification of all utility facilities within the project corridor. This will include Subsurface Utility Designation for underground facilities. Modification to the roadway design eliminating many potential conflicts will be the priority alternative. When a conflict is unavoidable, a cost-effective utility relocation design will be coordinated with the utility owner. STAR Solutions will have team members available to provide utility relocation design services for those who need assistance due to lack of available staffing or other resources.

Throughout the project development engineering process, STAR Solutions will plan and coordinate any necessary utility relocations so that they are properly identified in the construction schedule. As required by the PPTA statute, disagreements regarding utility relocations will be coordinated through the State Corporation Commission. None of the relocations are expected to be of durations that would affect the overall completion of the construction of a particular segment.

STAR Solutions' team member, Greenhorne & O'Mara, Inc., will be the task leader for the utility coordination, engineering design and utility relocation construction inspection of the project. They will provide project management for the utility tasks performed by the STAR Solutions team.

The estimated cost for utility coordination and relocation is included in our financial plan.













## Tab H Right-of-Way Requirements

***A statement of the right-of-way requirements for all areas where the proposed design is anticipated to exceed the existing right-of-way limits, including all toll plazas, truck climbing lanes, and interchange improvements.***

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The STAR Solutions team has determined that the acquisition of additional right-of-way will be necessary along the corridor. This includes the areas shown on the maps within VDOT's Study Books for I-81 plus additional acreages from those parcels to facilitate interchange expansion for truck movements, storm water management and separate truck rest areas.

At this time, we anticipate that our proposed design will impact and require the acquisition of 3,434 parcels of land and the possible relocation of 414 families and businesses. While many of the parcels to be acquired are strips along the existing right-of-way, some areas are highly developed and will require the relocation of families and businesses. Figure H-1 shows a breakdown of these acquisitions and relocations by milepost.

As part of the project development engineering, STAR Solutions will closely coordinate the roadway design considering the impacts on right-of-way requirements. Alternatives will be considered to minimize the amount of additional right-of-way needed and to avoid displacing families and businesses.

As VDOT's agent, our team is prepared to facilitate the acquisition process to allow VDOT to acquire the necessary right-of-way and provide relocation assistance services to the displaced individuals and businesses in accordance with the Uniform Relocation Assistance and Real Property Acquisition Laws. Adequate time will be established in the project schedule to allow the affected landowners and tenants to consider the acquisition and relocate.

As the project development schedule is established for each segment of the corridor, the parcels to be acquired will be prioritized based on the anticipated construction sequencing and the necessity for utility relocations. Parcel acquisitions groupings will be identified in the segment schedule with begin and end dates conforming to the overall segment schedule. Throughout the project development timeframe, these acquisition grouping line items will be tracked to ensure the schedule is being met.

STAR Solutions is also prepared to utilize and maintain data in VDOT's computerized Right-of-Way and Utilities Management System (RUMS). VDOT would have on-line access to the latest right-of-way acquisition and relocation assistance data. This will not only enhance the logistical coordination of the acquisitions but will also allow VDOT to use RUMS reports to monitor the overall progress.

STAR Solutions' team member Greenhorne & O'Mara, Inc. will be the task leader for the right-of-way and will work with the engineering design consultants to ensure that the most overall cost effective design features are incorporated into the project design.

Milepost	Milepost	County	Description	Parcels to be Acquired	Family or Business Relocations
7	10	Washington	Mainline	12	
10			Route F-310 Interchange	30	2
10	11	Washington	Mainline	19	
11			Industrial Park Interchange	41	10
11	13	Washington	Mainline	21	8
13			Route 611 Interchange	16	
13	15	Washington	Mainline	17	3
15			Route 140 Interchange	15	3
15	17	Washington	Mainline	11	
17			Route 75 Interchange	47	4
17	19	Washington	Mainline	11	3
19			Route 58/11 Interchange	44	1
19	22	Washington	Mainline	42	1
22			Route 704 Interchange	11	
22	25	Washington	Mainline	20	
25			Route 80 Interchange	30	3
25	26	Washington	Mainline	11	
26			Route 737 (Emory) Interchange	6	2
26	29	Washington	Mainline	16	
29			Route 91 (Glade Springs) Interchange	28	4
29	32	Washington	Mainline	34	7
32			Route 11/751 (Chilhowie)	9	3
32	35	Washington/Smyth	Mainline	26	4
35			Route 107 (Chilhowie)	28	9
35	39	Smyth	Mainline	6	
39			Route 11/645 (Seven Mile Road)	27	12
39	42	Smyth	Mainline	6	5
42			Route 11/660 Interchange	44	12
42	44	Smyth	Mainline	15	4
44			Route 11 (Marion)	7	
44	46	Smyth	Mainline	27	3
46			Route 16 (Marion)	6	2
46	47	Smyth	Mainline	4	1
47			Route 11 Interchange	5	3
47	50	Smyth	Mainline	22	
50			Route 11 (Atkins)	14	1
50	54	Smyth	Mainline	16	5
54			Route 683	3	
54	60	Smyth/Wythe	Mainline	41	
60			Route 90 (Rural Retreat)	18	3
60	66	Wythe	Mainline	42	2
66			Route 11/F-039 (Wytheville)	19	3
66	70	Wythe	Mainline	16	
70			Route 52 (Wytheville)	5	2
70	72	Wythe	Mainline		1
72			I-77 South Interchange	40	
72	73	Wythe	Mainline	10	4
73			Route 11 (Wytheville)	48	2
73	77	Wythe	Mainline	86	3
77			Ready Mix Road Interchange	40	4
77	80	Wythe	Mainline	178	12

Milepost	Milepost	County	Description	Parcels to be Acquired	Family or Business Relocations
80			Route 52 (Fort Chiswell)	41	7
80	81	Wythe	Mainline		5
81			Route 77 North Interchange	20	
81	84	Wythe	Mainline	13	
84			Route 619 Interchange	11	2
84	86	Wythe	Mainline	15	4
86			Route 618 Interchange	14	4
86	90	Wythe/Pulaski	Mainline	34	5
90			Route 100 Interchange	8	1
90	92	Pulaski	Mainline	14	1
92			Route 658 Interchange	12	4
92	94	Pulaski	Mainline	18	4
94			Route 94 (Pulaski) Interchange	5	
94	98	Pulaski	Mainline	33	4
98			Route (Dublin) Interchange	11	6
98	101	Pulaski	Mainline	13	3
101			Route 660	8	2
101	105	Pulaski/Montgomery	Mainline	37	1
105			Route 232 (Radford) Interchange	3	2
105	109	Montgomery	Mainline	31	3
109			Route 177 (Radford) Interchange	9	1
109	114	Montgomery	Mainline	39	1
114			Route 8 (Christianburg) Interchange	28	6
114	118	Montgomery	Mainline		
118			Route 11 (Christianburg) Interchange		
118	121	Montgomery	Mainline	9	
121			Smart Hwy Interchange		
121	128	Montgomery	Mainline	32	
128			Route 603 (Salem) Interchange	11	2
128	132	Montgomery/Roanoke	Mainline	26	
132			Route 647 (Dixie Cavern) Interchange	5	
132	137	Roanoke	Mainline	29	
137			Route 112 (Salem) Interchange	16	8
137	140	Salem	Mainline	69	5
140			Route 311 (Salem) Interchange	56	1
140	141	Salem	Mainline	11	1
141			Route 419 (Salem) Interchange	9	3
141	143	Salem/Roanoke	Mainline	56	19
143			Route 581 Interchange	16	2
143	146	Roanoke	Mainline	71	6
146			Route 115 (Hollings) Interchange	14	3
146	150	Botetourt	Mainline	42	4
150			Route 220 (Troutville) Interchange	20	16
150	156	Botetourt	Mainline	31	1
156			Route 640 (Fincastle) Interchange	9	
156	162	Botetourt	Mainline	49	1
162			Route 11 Interchange	11	5
162	167	Botetourt	Mainline	37	
167			Route 11 (Buchanan) Interchange	11	3
167	168	Botetourt	Mainline		9
168			Route 640 (Arcadia) Interchange	5	
168	175	Botetourt/Rockbridge	Mainline	43	

Milepost	Milepost	County	Description	Parcels to be Acquired	Family or Business Relocations
175			Route 11 (Natural Bridge) Interchange		
175	180	Rockbridge	Mainline	13	
180			Route 11 (Fancy Hill) Interchange		
180	188	Rockbridge	Mainline	17	
188			Route 60 (Lexington) Interchange	2	
188	191	Rockbridge	Mainline	3	
191			Route 64 South Interchange	1	
191	195	Rockbridge	Mainline	2	
195			Route 11 (Timber Ridge) Interchange	1	
195	200	Rockbridge	Mainline	18	
200			Route 710 (Fairfield) Interchange	13	3
200	205	Augusta	Mainline	7	
205			Route 606 (Raphine) Interchange	22	2
205	213	Augusta	Mainline	19	
213			Route 11 (Greenville) Interchange		
213	217	Augusta	Mainline	13	
217			Route 654 (Mint Springs) Interchange	11	1
217	220	Augusta	Mainline	6	
220			Route 262 (Stavnton) Interchange	4	
220	221	Augusta	Mainline		
221			Route 64 North Interchange	10	
221	222	Augusta	Mainline		
222			Route 250 (Stavnton) Interchange	8	
222	225	Augusta	Mainline	13	
225			Route 275 (Stavnton) Interchange		
225	227	Augusta	Mainline	2	
227			Route 612 (Verona) Interchange	4	
227	235	Augusta	Mainline	36	1
235			Route 256 (Weyers Cave) Interchange	8	2
235	240	Augusta/Rockingham	Mainline	36	2
240			Route 257 (Mt. Crawford) Interchange		
240	243	Rockingham	Mainline	18	
243			Route 11 (Harrisonburg) Interchange	10	5
243	245	Rockingham	Mainline	27	
245			Route 659 (Port Republic Road) Interchange	49	7
245	247	Rockingham	Mainline	13	
247			Route 33 (Harrisonburg) Interchange	36	1
247	251	Rockingham	Mainline	12	2
251			Route 11 (Harrisonburg) Interchange	10	1
251	257	Rockingham	Mainline	45	2
257			Route 11 (Broadway) Interchange	3	
257	264	Shenandoah	Mainline	45	3
264			Route 211 (New Market) Interchange	7	2
264	269	Shenandoah	Mainline	15	3
269			Route 730 Interchange	18	2
269	273	Shenandoah	Mainline	10	
273			Route 292 (Mt. Jackson) Interchange	5	
273	277	Shenandoah	Mainline	15	
277			Route 614 (Bowmans Cross) Interchange	3	
277	279	Shenandoah	Mainline	6	
279			Route 185 (Edinburg) Interchange	12	5
279	283	Shenandoah	Mainline	14	

Milepost	Milepost	County	Description	Parcels to be Acquired	Family or Business Relocations
283			Route 42 (Woodstock) Interchange	27	2
283	291	Shenandoah	Mainline	63	1
291			Route 651 (Toms Brook) Interchange	8	
291	296	Shenandoah	Mainline	43	3
296			Route 55 (Strasburg) Interchange	9	2
296	298	Shenandoah	Mainline	10	
298			Route 11 (Strasburg) Interchange	3	
298	300	Warren/Frederick	Mainline	10	
300			Route 66 Interchange	5	
300	302	Frederick	Mainline	7	
302			Route 627 (Middleton) Interchange	10	1
302	307	Frederick	Mainline	7	
307			Route 277 (Stephens City) Interchange	6	1
307	310	Frederick	Mainline	10	
310			Route 37 (Winchester) Interchange	22	
310	313	Frederick	Mainline	13	
313			Route 50 (Winchester) Interchange	8	
313	315	Frederick	Mainline	17	3
315			Route 7 (Winchester) Interchange	25	29
315	317	Frederick	Mainline	12	
317			Route 11 Interchange	10	9
318		Frederick	Route 37 (N) Bypass	16	9
317	321	Frederick	Mainline	47	1
321			Route 672 Interchange	3	
321	323	Frederick	Mainline	3	3
323			Route 669 Interchange	3	
323	W. VA.	Frederick	Mainline		
				3434	414



## Tab I Property Acquisition

***A statement setting out a plan for securing and/or contributing all necessary property for the completion of the proposed project, including an estimate of the costs for acquisition of the property and the proposed source of funding for the acquisition.***

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As indicated in Tab H, additional right-of-way and easements will be necessary to construct the proposed improvements. STAR Solutions anticipates that all additional right-of-way will have to be acquired through payment of just compensation. Any right-of-way or easements will be acquired in compliance with the federal and state Uniform Relocation Assistance and Real Property Acquisition laws.

As part of the project development engineering, STAR Solutions will closely coordinate the roadway design with our right-of-way consultants to minimize the amount of additional right-of-way needed and to avoid displacement of families and businesses. Appropriate measures will also be incorporated to minimize damage to properties partially affected by the proposed improvements.

The STAR Solutions team will monitor development activities along the corridor as the roadway plans are being prepared. The team will make every effort to see that the project right-of-way requirements are provided for in new development plans. Where appropriate, advanced acquisitions will be made to prevent costly development from occurring within the anticipated right-of-way limits.

In those instances where it is clearly identified that a right-of-way acquisition will be a total taking, STAR Solutions will proceed with those acquisitions in advance of the remaining partial acquisition requirements. This will ensure that any displaced family or business will have sufficient time to complete their relocation. We are prepared to provide relocation assistance services to the displaced individuals and businesses in accordance with the Uniform Acts.

STAR Solutions' estimated cost for additional right-of-way is \$314,709,570, which is included in our financial plan. The source of funding for the right-of-way is from project finances, including federal, state, bond proceeds or toll revenues.

While the STAR Solutions team will make every reasonable effort to negotiate the voluntary conveyances of the necessary additional right-of-way or easement, it is anticipated that agreements will not be reached on all properties. There will also be some properties where title defects or unknown landowners will require the use of eminent domain statutes. In all of these situations, STAR Solutions will request that VDOT institute eminent domain proceeding by filing a Certificate of Take. We will also request that VDOT and the Attorney General's Office manage the cases through appointed counsel. STAR Solutions would provide any assistance that may be needed.

STAR Solutions' team member, Greenhome & O'Mara, Inc., will be the task leader for right-of-way and will work with the engineering design consultants to ensure that appropriate design features and right-of-way data are incorporated into the project design. They will also be responsible for managing all acquisition and relocation activities performed by their staff or other team member firms. All right-of-way services performed will conform to federal and state laws and VDOT's *Right-of-Way and Utilities Manual of Instructions*.

## Tab J Level of Service Design Criteria

***An explanation of how the proposer intends to satisfy the Level of Service (LOS) design criteria requirements for projects on the National Highway System, which mandates that any proposed design accommodates the projected traffic with a minimum of a 20-year horizon, including all mainline lanes and interchanges.***

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STAR Solutions thoroughly understands the FHWA design year Level of Service (LOS) design criteria for projects on the National Highway System (NHS) based on a minimum 20-year horizon. The FHWA design year LOS requirements for projects on the NHS are based on the LOS standards provided in the AASHTO publication, *A Policy on Geometric Design of Highways and Streets, 2001* (Green Book). NHS projects must provide a 20-year design life for reconstruction and new construction projects.

LOS requirements by the FHWA include:

- Rural NHS Routes (including rural interstates)
  - Mainline lanes–LOS B (go to LOS C on the mainline if LOS B is not reasonable\* or if the terrain is mountainous\*)
  - Auxiliary lanes–LOS C
- Urban NHS Routes (including urban interstates)
  - Mainline and auxiliary lanes–LOS C (LOS D may be used in heavily developed sections of metropolitan areas\*)

**\* FHWA Division Office must concur, in writing, that such conditions exists.**

Based on our preliminary analysis of 2025 traffic conditions using Highway Capacity Software (HCS) as a planning tool, STAR Solutions has developed cross sections for the entire I-81 corridor within this scope of this study. The number of truck-only lanes and multi-purpose lanes proposed by STAR Solutions will meet the FHWA requirements for this study as described above. In most cases, the LOS B threshold in the rural areas created an unreasonable requirement for the proposed number of lanes; therefore, a LOS C threshold was used in the rural areas. In the more urbanized areas, the interchange spacing is typically reduced, which requires collector-distributor (C-D) roads to be constructed. With the C-D road network in the urbanized areas, LOS C and, in extenuating circumstances, LOS D will be achieved.

Each interchange will be closely analyzed to ensure that LOS C can be achieved on all movements within the interchange footprint. The urban interchanges are designated in Figure J-1. Based on information provided to VDOT by FHWA on July 12, 2001, the following interchanges in the I-81 corridor were declared to be within the urban boundary. According to FHWA, "If you [VDOT] are [is] able to provide information which demonstrates that the extent of the urban area or development pattern is likely to change prior to the 2025 design year, we will reconsider these designations accordingly." Since the Winchester area will be within an MPO area, we have included the interchanges identified in bold in the table below in the urban classification.



**An explanation of how the proposer intends to satisfy the Level of Service (LOS) design criteria requirements for projects on the National Highway System, which mandates that any proposed design accommodates the projected traffic with a minimum of a 20-year horizon, including all mainline lanes and interchanges.**

**Figure J-1: Urban Interchanges**

Urban Area	Jurisdiction	Interchanges	Functional Class	Standard
Bristol	Washington Co.	1, 3, 5, 7	UI	Urban
Bristol	City of Bristol	10	UI	Urban
Wytheville	Town of Wytheville	70, 72, 73	UI	Urban
Christiansburg	Town of Christiansburg	114, 118	UI	Urban
Roanoke	City of Salem	137, 140, 141	UI	Urban
Roanoke	Roanoke County	143, 146	UI	Urban
Roanoke	Botetourt County	150	UI	Urban
Harrisonburg	City of Harrisonburg	243, 245, 247	UI	Urban
<b>Winchester</b>	<b>City of Winchester</b>	<b>310, 313, 315, 317</b>	<b>UI</b>	<b>Urban</b>

In addition to the 2025 analysis on which we based our proposal, we also projected the traffic to 2035. This was done to determine if some changes could be made to our proposal that could accommodate the 2035 needs. Our analysis shows that additional lane(s) in each direction may be required as follows:

- Car lane from I-77 south to Bristol
- Truck lane between Route 460 at Christiansburg and Route 33 in Harrisonburg
- Car lane(s) between Roanoke and Harrisonburg.

From an engineering perspective, our typical section will accommodate the additional truck lane. However, the future addition of both truck and car lanes will require additional right-of-way, which is not in our proposal. During the negotiations for the Comprehensive Agreement, VDOT may want to consider addressing this issue.

## Tab K Required Approvals

***An explanation of how the proposer plans to gain all approvals required to proceed with the project, including all financial, environmental, legislative, interstate access modification and design exception approvals.***

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Through an accelerated design and construction schedule, STAR Solutions proposes to complete the improvements to the I-81 corridor in 15 years. The completion of the project is expected to improve traffic flow and public safety, provide dedicated lanes for passenger and commercial vehicles, and enhance intermodal transportation. Our plan is based on existing weights and loads restrictions and we are not proposing or advocating a change in that regard. This section details our plan for acquiring the necessary approvals to keep the project on schedule.

### **Financial**

The following significant approvals are anticipated to be completed prior to the initial financing:

- FHWA approval to collect tolls on I-81
- Receipt of a FHWA Record of Decision
- Confirmation of the availability of anticipated federal and state funds
- Signing a Comprehensive Agreement that includes a Design-Build Contract and an Operating Agreement relating to the project
- Receipt of investment grade ratings and, if economically beneficial, credit enhancement on the Toll Revenue Bonds
- Acceptance of the project for TIFIA credit assistance and finalization of the first tranche of the TIFIA Secured Loan Agreement

### **Environmental**

The STAR Solutions team understands that VDOT will be responsible for the Tier 1 Environmental Impact Statement (EIS) for the I-81 project. National Environmental Policy Act (NEPA) regulations (23 CFR 771.111 (g)) allow for the tiering of EISs for major transportation projects. The first tier EIS would focus on broad issues related to the major alternatives, including a determination of independent and logical termini. The second tier would focus on smaller segments, or projects and would address site-specific impacts. The NEPA regulations allow using an environmental assessment for second tier actions. It is also possible that categorical exclusions could be used where no significant impacts are anticipated.

The STAR Solutions team stands ready to assist immediately after executing of a Comprehensive Agreement. If needed, the STAR Solutions team will work closely with VDOT to coordinate the team's involvement. The team will set up regional environmental investigation groups, supervised by an experienced environmental document manager to provide consistency and a single point of contact. The groups will include staff with the needed areas of expertise, such as planners, wetland and stream scientists, fisheries and endangered species biologists, geologists, geohydrologists, archaeologists, and architectural historians.



***An explanation of how the proposer plans to gain all approvals required to proceed with the project, including all financial, environmental, legislative, interstate access modification and design exception approvals.***

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### **Permits and Approvals**

All permitting and related approvals will be the full responsibility of STAR Solutions. The following environmental permits and approvals can be anticipated:

#### Permits—Federal

- Section 404, Clean Water Act
- Sections 9 and 10, Rivers and Harbors Act
- Tennessee Valley Authority
- Endangered Species Incidental Take

#### Permits—State

- Virginia Water Protection
- Virginia Pollutant Discharge Elimination
- Virginia Air Pollution Control Law (rock crushing, asphalt production)
- Subaqueous Bed

#### Approvals—Federal

- Environmental Protection Agency (Section 404 permit)
- EPA (Safe Drinking Water Act, Underground Injection Control Program)
- US Fish and Wildlife Service (Section 404/10 permit, Endangered Species Act)
- Advisory Council on Historic Preservation

#### Approvals—State

- Department of Game and Inland Fisheries
- Department of Conservation and Recreation
  - Division of Soil and Water Conservation
  - Division of Planning and Recreation
  - Division of Natural Heritage
- Department of Historic Resources
- Department of Health

At project onset, the team will appoint an experienced individual to lead a group of permitting specialists whose sole responsibility will be to identify, manage and complete the permitting process for the project. This Permitting Director will coordinate closely with VDOT to assure compliance with VDOT procedures and environmental goals.

***An explanation of how the proposer plans to gain all approvals required to proceed with the project, including all financial, environmental, legislative, interstate access modification and design exception approvals.***

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### **Policy-Level Approach**

The Permitting Director will also coordinate with federal, state and local officials to develop a high-level policy approach to expediting the permitting process. This approach will provide consistency and quality in the permitting process for the entire project. The following specific measures will be taken:

- The permitting team will request the establishment of an agreement with the agency heads to set out processes and timeframes for permit review and approval
- STAR Solutions will also implement policies that address consistency in impact accounting and regional compensatory mitigation approaches
- STAR Solutions will request that each regulatory or review agency designate one representative who will be “the responsible party” for the agency review and coordination required for the permits
- The team will provide regular permit review meetings at central locations and offer other support, as needed, to the regulatory agencies to make it easier for them to focus on the needed permits
- STAR Solutions will develop permit applications concurrently with the required environmental documents and design activities to keep the project on a “fast-track” development schedule
- The permitting team will work closely with the designers to develop permissible designs, taking care to minimize impacts while maintaining a constructible design

### **Detailed Studies**

The STAR Solutions team will undertake the detailed studies needed to complete the permit application process, such as wetland delineations and functional assessments, stream evaluations, and endangered and threatened species studies. We will establish technical investigation groups specific to each topic area to conduct the studies in each project segment according to the project schedule. This will ensure consistency in methodology, quality of the resulting product and timely information to meet the project schedule. The following teams will be established:

- **Wetland Delineation/Functional Assessment/Mitigation Team:** This group will conduct needed wetland delineations and functional assessments. In addition, they will evaluate further measures to avoid, minimize and compensate for wetland impacts, working in conjunction with the design teams. The group will obtain U.S. Army Corps of Engineers jurisdictional confirmation for the wetland boundaries. They will also conduct detailed evaluations of any previously identified potential wetland compensation sites and, if needed, identify and evaluate additional sites.

***An explanation of how the proposer plans to gain all approvals required to proceed with the project, including all financial, environmental, legislative, interstate access modification and design exception approvals.***

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- **Stream Team:** Due to the importance of streams along the corridor and the recent agency focus on stream impact mitigation, a special stream team will be established to conduct needed stream and fisheries evaluations. They will also evaluate measures to avoid, minimize and compensate for stream and fisheries impacts, working in conjunction with the design teams. The group will conduct detailed evaluations of any previously-identified potential stream compensation sites and, if needed, identify and evaluate additional sites.
- **Wildlife and Endangered Species Team:** This group will consist of specialists on a variety of sensitive species. They will conduct evaluations of potentially-impacted threatened, endangered, and candidate species, and their habitats. Of particular concern are the many populations of mussels in streams in the project area. This group will also evaluate measures to avoid impacts to any identified species. If needed, the group will conduct biological assessments for federally-listed species that would be impacted by the project. In addition, specialists will evaluate potential impacts to sensitive species, such as black bears in the Staunton District, and develop needed impact mitigation measures, such as “bear crossings” under the right-of-way.
- **Cultural Resources Team:** This specialty group will conduct any needed studies on potential cultural resource sites, including archaeological sites, historic structures, battlefields and historic districts. The group will do Phase I and Phase II investigations, as needed. They will determine eligibility of potentially-impacted properties for the National Register of Historic Places and initiate consultation, in coordination with VDOT and the Virginia Department of Historic Resources.
- **Hazardous Materials Team:** The haz mat group will be composed of individuals knowledgeable of federal, state and local laws and regulation regarding hazardous sites and materials. The group will conduct needed investigations regarding project areas that could contain hazardous materials, buried tanks, contamination or pollution. As needed, the group will conduct Phase I Environmental Site Assessments for suspect properties. If further detailed investigations are needed on properties to be impacted, the group will conduct Phase II Environmental Site Assessments.
- **Karst Team:** The Karst group will be unique within the framework of the environmental approval process because it will contain individuals with a variety of expertise, including geology, hydrogeology, hydrology, structural engineering and ecology. This group will identify Karst features within or adjacent to the project footprint and evaluate the potential impacts, both physical and ecological, of the project on the Karst features and of the Karst features on the project integrity. In areas where there is a potential conflict, the group will work with VDOT, the designers and the contractors to develop appropriate mitigation measures. The group will focus on the effects of stormwater management focus for this group.



***An explanation of how the proposer plans to gain all approvals required to proceed with the project, including all financial, environmental, legislative, interstate access modification and design exception approvals.***

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**Mitigation**

As described in our Conceptual Proposal, STAR Solutions proposes to develop one coherent and comprehensive natural and physical resources mitigation plan concurrently with the document and permit application process. Early coordination with the regulatory agencies of this comprehensive plan will allow the team to target the needed mitigation measures to integrate them into the preliminary design. Early coordination will also allow for initiating purchase of potential mitigation sites at the beginning of the right-of-way acquisition process.

The team will develop project mitigation using state-of-the-art environmental assessment and protection techniques and will employ Best Management Practices to meet or exceed all local, state and federal requirements. Any pollution remediation will be carried out according to local, state and federal laws and regulations.

The Permitting Director will establish a mitigation team whose responsibility will be to work with the agencies to develop the mitigation plan. The mitigation team will work concurrently with the contractors and designers to identify constraints and opportunities presented by the mitigation plan. Once the plan concept has been agreed upon, the team will follow up with the individual segment designers and contractors to implement specific measures in each section.

The mitigation team will include individuals with experience in design of wetland and stream mitigation. Moving from the initial mitigation concept, these individuals will conduct detailed evaluations of proposed sites and design the appropriate measures to incorporate into construction plans. These plans will be coordinated with the contractors to assure that constructability issues are taken into consideration.

The Permitting Director will request the establishment of regional stream and wetland compensation sites, where appropriate, to take advantage of the cost savings that larger site economies of scale can produce. Additionally, a few larger compensation sites may be ecologically more beneficial than many small individual sites. For example, we would promote the establishment of a single mitigation bank within the Potomac River Watershed, which would address project impacts between Staunton and the West Virginia state line.

**Monitoring**

The STAR Solutions team will establish the framework of the environmental monitoring program as part of the environmental approvals process. This is needed because the environmental permits to be issued for the project will require that a Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention Control and Countermeasures Plan (SPCCP) be prepared as a condition of the permit.

We will establish a monitoring team to develop these needed plans and implement the monitoring program during construction. The monitoring team will work closely with each segment contractor in developing the SPCCP and SWPPP plans to assure that the specific measures proposed in the plans are constructible and that the individuals named as responsible are the appropriate staff for the role.

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***An explanation of how the proposer plans to gain all approvals required to proceed with the project, including all financial, environmental, legislative, interstate access modification and design exception approvals.***

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Additionally, VDOT may require that an Environmental Monitoring Manual be prepared, as was done on the Route 288 PPTA project. Whether or not VDOT requires such a manual, the team will prepare one to ensure consistency in implementing compliance on this large project. One "master" environmental monitoring manual will be prepared for the project, which will be supplemented by project-specific manuals for each project segment. The monitoring manual will set out the environmental permit conditions that must be complied with and the roles and responsibilities of the parties involved, including the contractors, construction inspectors and environmental monitors. The manual will also define the chain of command to resolve issues and conflicts. Early development of the master and segment plans will ensure a smooth transition from the design to the construction stage of the project.

**Legislative**

The STAR Solutions team is not aware of any state or federal statutory barriers to the development of its base proposal. We do not anticipate the need for any state approvals for the TIFIA loan since it will be secured by the 63 (20) entity created for this project and not the Commonwealth. We intend to continue our efforts to secure federal funding for this project in cooperation with VDOT. Furthermore, should VDOT decide to proceed with an expanded scope or reduce our proposed toll rates, Virginia law may have to be changed to permit tolls on all classes of vehicles. Finally, we may need to work with VDOT to amend various state laws related to toll collection. Such decisions will be driven by the type of system and its management as agreed upon in the comprehensive agreement.

**Interstate Access Modifications**

Members of the STAR Solutions team have successfully worked on interstate access modification reports with VDOT and FHWA staff in the I-81 corridor. More specifically, the Exit 14 Interstate Access Modification Report was reviewed and approved by VDOT and FHWA. Therefore, all steps necessary to gain approval for interstate access modification reports are clearly understood by our team. Approvals are most easily obtained by using the following procedures:

- Involve FHWA Division Office staff early in the process so all assumptions are discussed and agreed upon. Consistent coordination with the Division Office staff will be required to ensure that potential exceptions are discussed early in the process.
- Follow the FHWA procedures for Additional Interchanges to the Interstate System identified in the Federal Register: February 11, 1998 (Volume 63, Number 28), which is supplemented by the VDOT Location and Design Instructional and Informational Memorandum LD-98 (D) 200.1. The FHWA procedures identified in this register also pertain to interchange modifications.
- VDOT requires that CORSIM be used to analyze the LOS impacts for all interchange modifications. This detailed microscopic analysis tool will allow for the computation of delay, speeds and corresponding LOS in both the truck-only lanes and the multi-purpose lanes.



***An explanation of how the proposer plans to gain all approvals required to proceed with the project, including all financial, environmental, legislative, interstate access modification and design exception approvals.***

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Since VDOT has issued an RFP for the I-81 NEPA Study, our team understands that most of the interstate access modifications will be completed during that project.

**Design Exception Approvals**

As previously discussed in Tab C, when requesting a design exception becomes the most viable alternative, STAR Solutions will prepare a fact sheet to support VDOT's request for final approval by FHWA. This fact sheet will include the following information:

- The minimum design values that can not be attained
- Why the minimum design values can not be attained
- The values that can be attained
- The accident history at this location
- Alternatives that have been evaluated to meet design values and reasons for rejecting them
- Total cost of the proposed construction versus the total cost meeting design values
- Project delay and consequences as a result of meeting the design values
- A narrative of why it is felt that the design exception should be approved

## Tab L Project Schedules

*A schedule for the overall project and for each section or segment of the project showing the sequence and interdependence of activities required for completion of the work, the date on which work will commence and the contemplated dates for completing items of work. The initial baseline schedule should include either diagrams or bar charts and tabular schedule reports showing start and finish dates. Intermediate completion milestones shall be included. The diagram shall clearly depict the order, interdependence and duration of each activity. The diagram shall be neatly lettered and legibly drawn. A written narrative of the initial baseline schedule shall be submitted and describe each element shown. For your schedule, assume January 2005 as the date of the Record of Decision for the project.*

*The baseline schedule shall include, but not be limited to:*

- 1. Any required legislative actions or regulatory approvals*
- 2. Preliminary design*
- 3. NEPA compliance activities*
- 4. Finalization of Finance Plan*
- 5. Environmental permitting*
- 6. Design Completion*
- 7. Right-of-way acquisition*
- 8. Utility relocation work by public and private utility companies*
- 9. Construction*
- 10. Paving activities*
- 11. Completion date*

*Ensure that valid assumptions are utilized for all schedule durations (for example, utilize a valid assumption for the duration of the required environmental activities).*

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### **Concept**

The project is planned in four phases spanning approximately 15 years for engineering and construction. We have developed an estimate-based overview schedule presenting the four phases, plus activities that involve multiple phases.

To support the phase work, some amount of advance bridge structure and drainage work will be required to complete the project. Each phase includes elements of all development steps.

### **Plan and Assumptions**

The plan anticipates execution of the Comprehensive Agreement at the beginning of 2004. Work in 2004 will include engineering support to VDOT's NEPA compliance effort and preparations for the project financing plan. The engineering work will focus on the requirements for our plan to be considered as an alternative for the NEPA analysis.



***A schedule for the overall project and for each section or segment of the project showing the sequence and interdependence of activities required for completion of the work, the date on which work will commence and the contemplated dates for completing items of work. The initial baseline schedule should include either diagrams or bar charts and tabular schedule reports showing start and finish dates. Intermediate completion milestones shall be included. The diagram shall clearly depict the order, interdependence and duration of each activity. The diagram shall be neatly lettered and legibly drawn. A written narrative of the initial baseline schedule shall be submitted and describe each element shown. For your schedule, assume January 2005 as the date of the Record of Decision for the project.***

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It is assumed that the NEPA process will conclude with a Record of Decision by the end of 2004 establishing purpose and need, the preferred alternative selection, and any segment definition needed for further environmental documentation. It is assumed that the section of I-81 between Lexington and Staunton (I-64W to I64E) will qualify for Categorical Exclusion or Environmental Assessment status that will allow construction to proceed as soon as engineering is ready. In parallel, the project financing plan will fulfill the regulatory and market requirements for the first financial closing in January 2005.

The project will be busy in all categories of work from 2005-2008. Engineering will include the required survey and geotechnical work to be accomplished along with public hearings and preliminary design (35 percent plans) for all of the phases. Final design will be developed for any "Hot Spot" segments cleared through the environmental process. Final design for each of the remaining phases will be developed in a timely manner to meet construction schedules, while at the same time working with the contractors to provide "value added" plans. Engineering is scheduled to begin as data becomes available from the survey and geotechnical efforts, and, in turn, will provide input to the environmental permit process, right-of-way procurement, and detail design. With detail engineering underway, utility relocations will be planned in coordination with the construction activities.



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***Ensure that valid assumptions are utilized for all schedule durations (for example, utilize a valid assumption for the duration of the required environmental activities).***

The key to timely performance will be the teamwork of STAR Solutions, VDOT, FHWA, the MPOs and the local governments all working together to finalize plan development. This will enable the VDOT/STAR Solutions partnership to streamline resolution comments from the field reviews, final design reviews and any approvals required to proceed with construction.

Phase 1 road and bridge construction will begin January 2007 and take 36 months to complete. During construction, we will maintain two lanes of traffic in both directions. Temporary lane closures will be necessary to set and remove traffic barriers. Some nighttime stoppages of a minimal duration will be required to set structural steel for overhead bridges. The entire section will be under construction during the entire period to ensure completion within 36 months.

For Phases 2, 3 and 4, we will begin construction of select mainline bridges, overpasses and secondary relocations throughout the corridor as necessary to ensure that we can maintain two lanes of traffic for mainline construction. In locations such as Roanoke, Harrisonburg, Winchester and the overlap section of I81/I77 in Wytheville, stages of construction will be initiated as early as is practical to help ease the local congestion in these areas.

Work throughout the life of the project will emphasize the safety of all and meet all environmental requirements.



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***Ensure that valid assumptions are utilized for all schedule durations (for example, utilize a valid assumption for the duration of the required environmental activities).***

#### **Software**

Primavera Project Planner (P3) software has been used to create the attached schedule. STAR Solutions intends to use P3 or P3e/c throughout the life of the project to maintain schedule updates and develop reports. P3 is a program that interfaces with other STAR Solutions software and it accommodates all the activity details needed to provide Critical Path Method (CPM) analysis and reporting. P3 is a proven, industry-preferred standard with broad program/project integration capacity suitable for large-scale projects that require fine levels of task detailing.

#### **Process**

Members of STAR Solutions employ rigorous and dynamic project controls that integrate estimating, cost, scheduling and quantities. This is achieved by early development of the Work Breakdown Structure (WBS). Common coding allows checks and balances of time and money.

#### **Organization**

Development of the schedule will include extensive activity coding to fully incorporate the project WBS. Further, we plan to coordinate project bid items with established VDOT bid item identification. The activity coding allows us to group the various design/procure/construct activities and enables separate filters for review, summarization and reporting.



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***Ensure that valid assumptions are utilized for all schedule durations (for example, utilize a valid assumption for the duration of the required environmental activities).***

The schedule will be able to provide versatile isolations, such as by individual contractor or specific project area, for quick, drill-down analysis. The program will also coordinate with expenditures for more effective cost control and performance management. The detail program of a contractor using P3 can be integrated into the master project database.

#### **Development**

The overview schedule included at the end of this section will be substantially expanded for detail planning and revised as engineering is completed. The schedule is to be reviewed by the Project Director and on-site staff and modified to reflect additional information as it becomes available. The original schedule is to be preserved as a baseline for comparison of performance against future iterations. The revised schedule timeframes for completing tasks are to be used to prepare subcontracts that integrate the efforts of all parties. Each subcontractor will be required to present a detailed plan of action that clearly indicates how the contractor will perform the work and meet the established milestones.



***A schedule for the overall project and for each section or segment of the project showing the sequence and interdependence of activities required for completion of the work, the date on which work will commence and the contemplated dates for completing items of work. The initial baseline schedule should include either diagrams or bar charts and tabular schedule reports showing start and finish dates. Intermediate completion milestones shall be included. The diagram shall clearly depict the order, interdependence and duration of each activity. The diagram shall be neatly lettered and legibly drawn. A written narrative of the initial baseline schedule shall be submitted and describe each element shown. For your schedule, assume January 2005 as the date of the Record of Decision for the project.***

***The baseline schedule shall include, but not be limited to:***

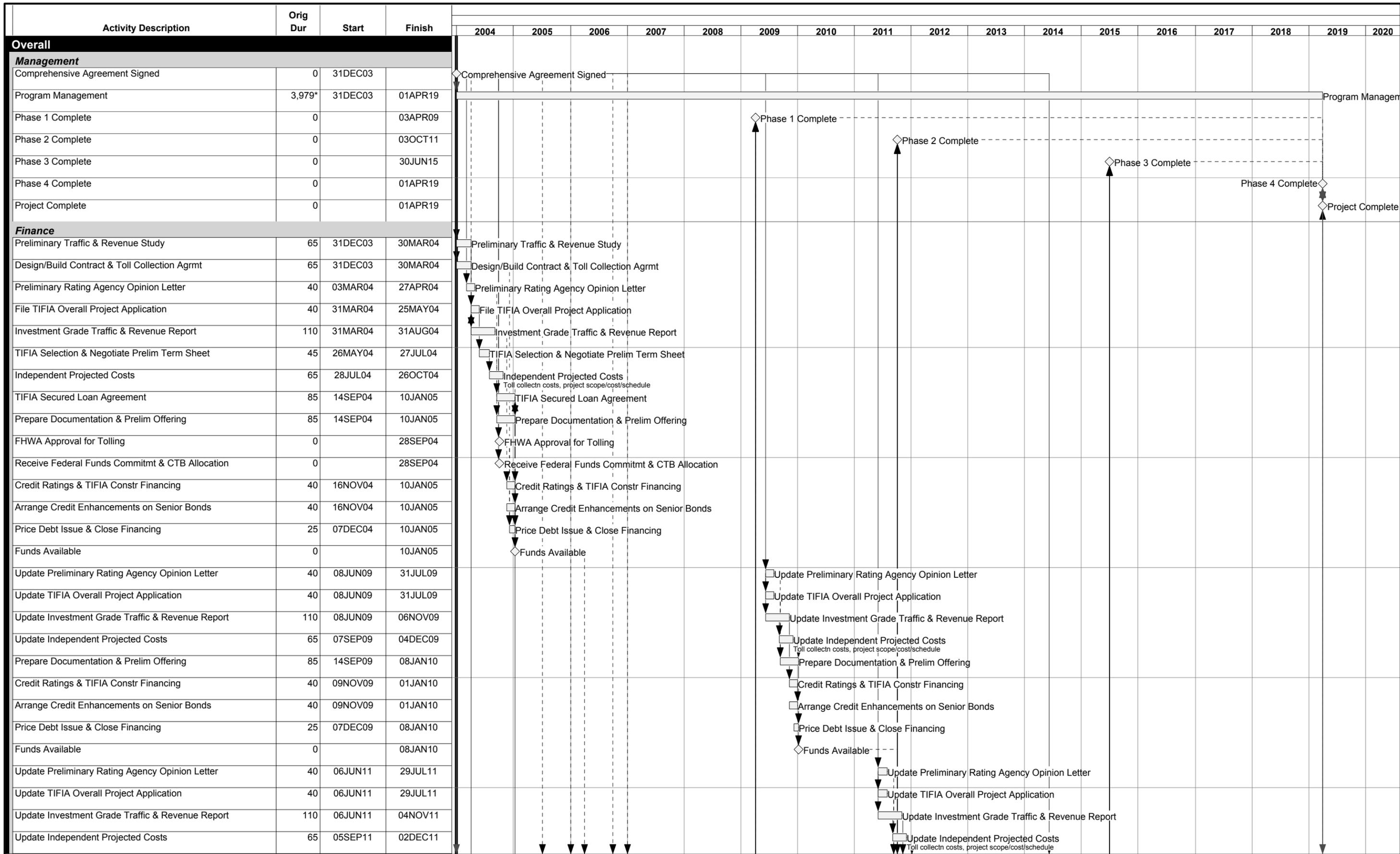
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***Ensure that valid assumptions are utilized for all schedule durations (for example, utilize a valid assumption for the duration of the required environmental activities).***

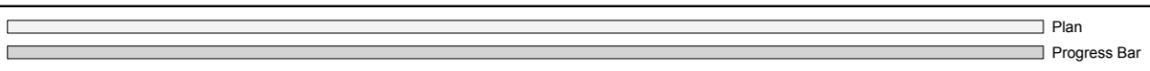
#### **Practice**

The CPM schedule will be updated on a regular basis using look-ahead reports generated from the detailed schedule. Status information is to be developed by subcontractors and reviewed by STAR Solutions' managers prior to being incorporated into the update. With each update, the Project Scheduler will review the schedule to verify that milestone dates are being met. As part of this analysis, the critical path is reviewed to determine if baseline schedule activities are ahead of or behind schedule. The review process also examines the performance of individual subcontractors and identifies progress by areas of the project. In the event that any contractor or area begins to fall behind, a recovery plan is required from all of the contractors involved. That work will receive special focus to verify prompt action.

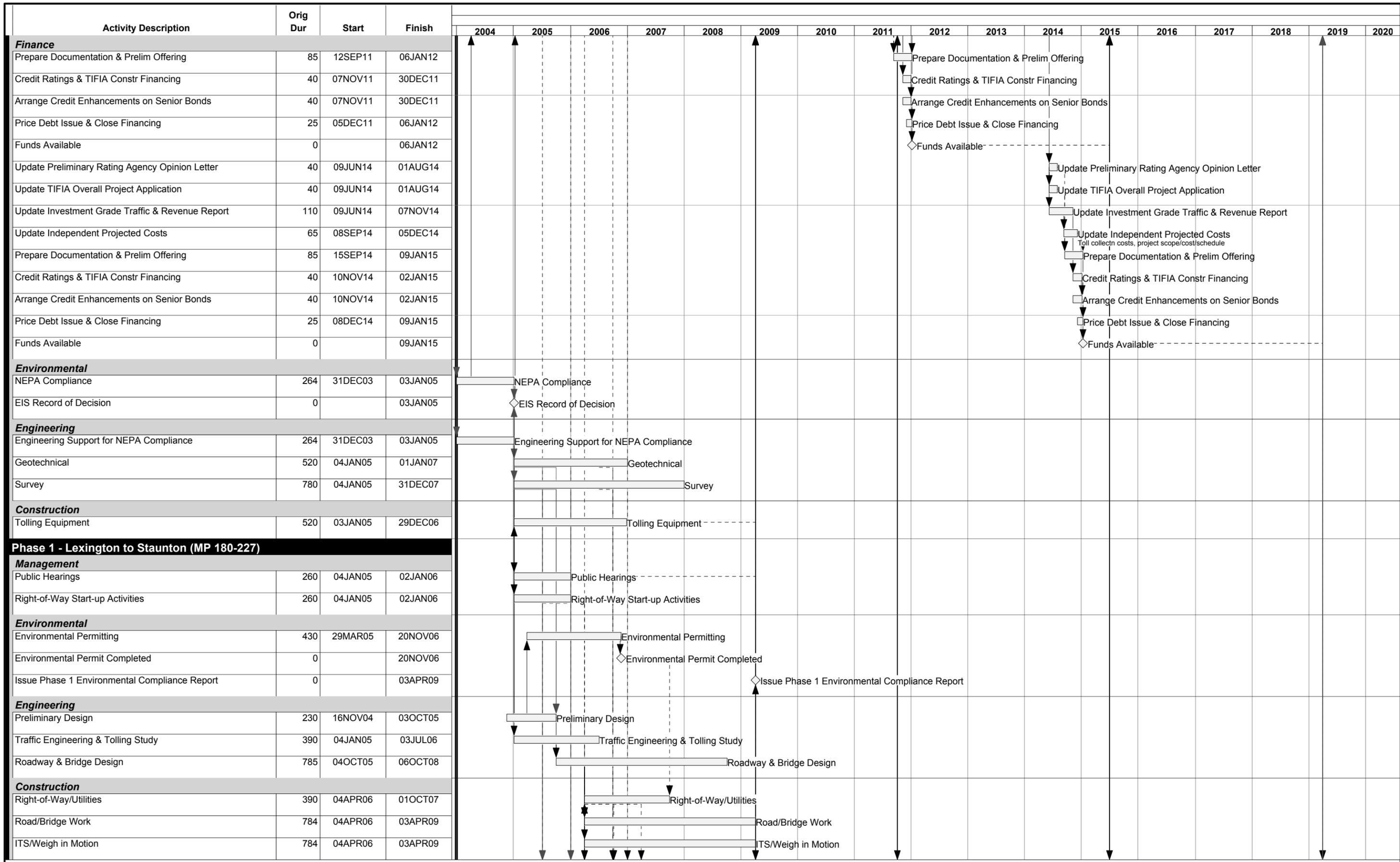
We will regularly review concepts and methods. Monthly reports will identify project progress and major concerns.



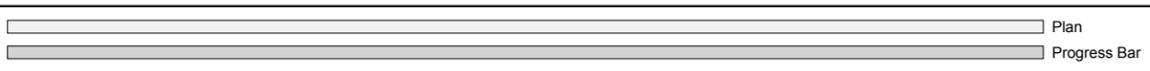
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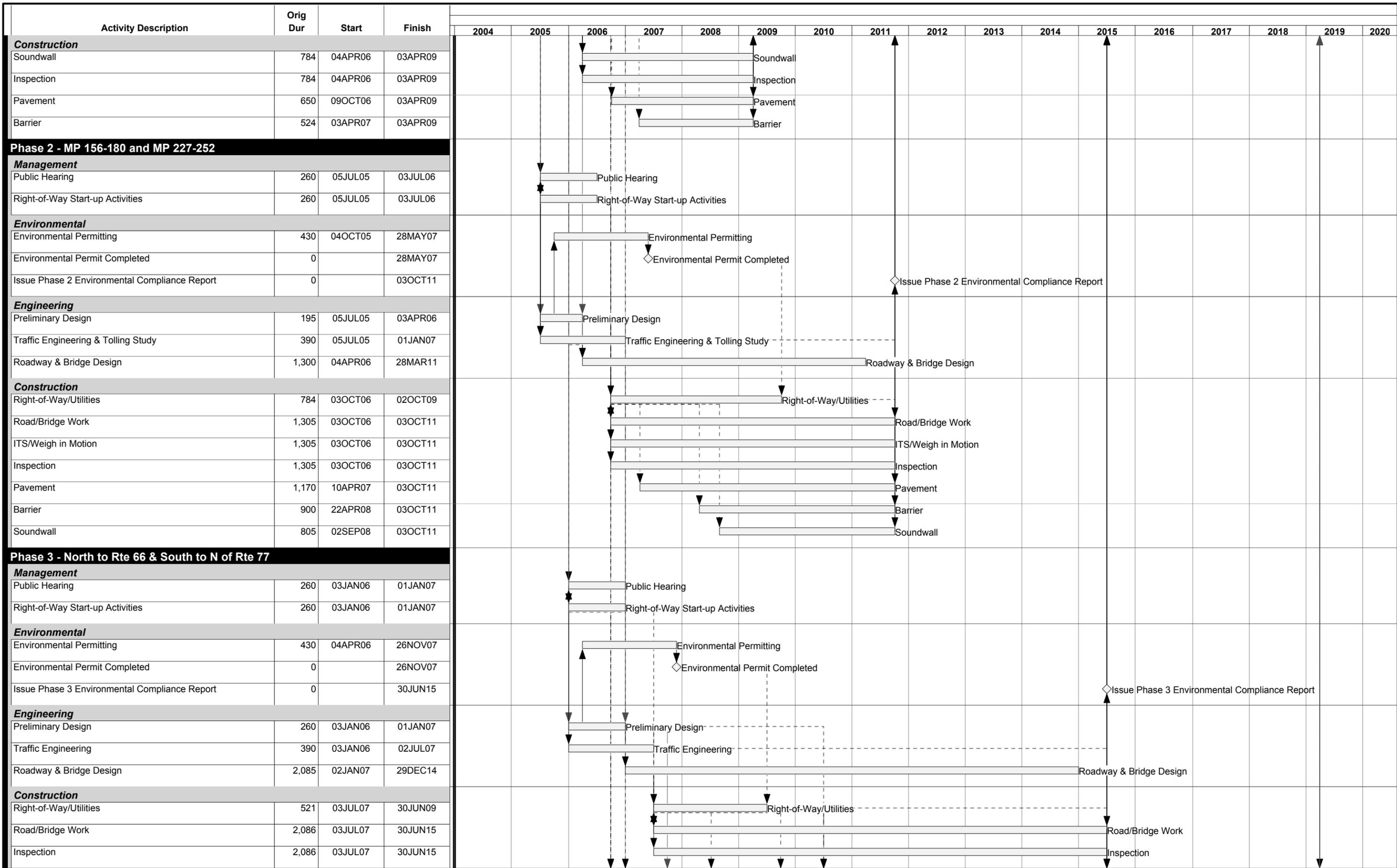
Phase Three - Detailed Proposal  
 Improvements to the I-81 Corridor



Start Date 31DEC03  
 Finish Date 01APR19  
 Data Date 31DEC03  
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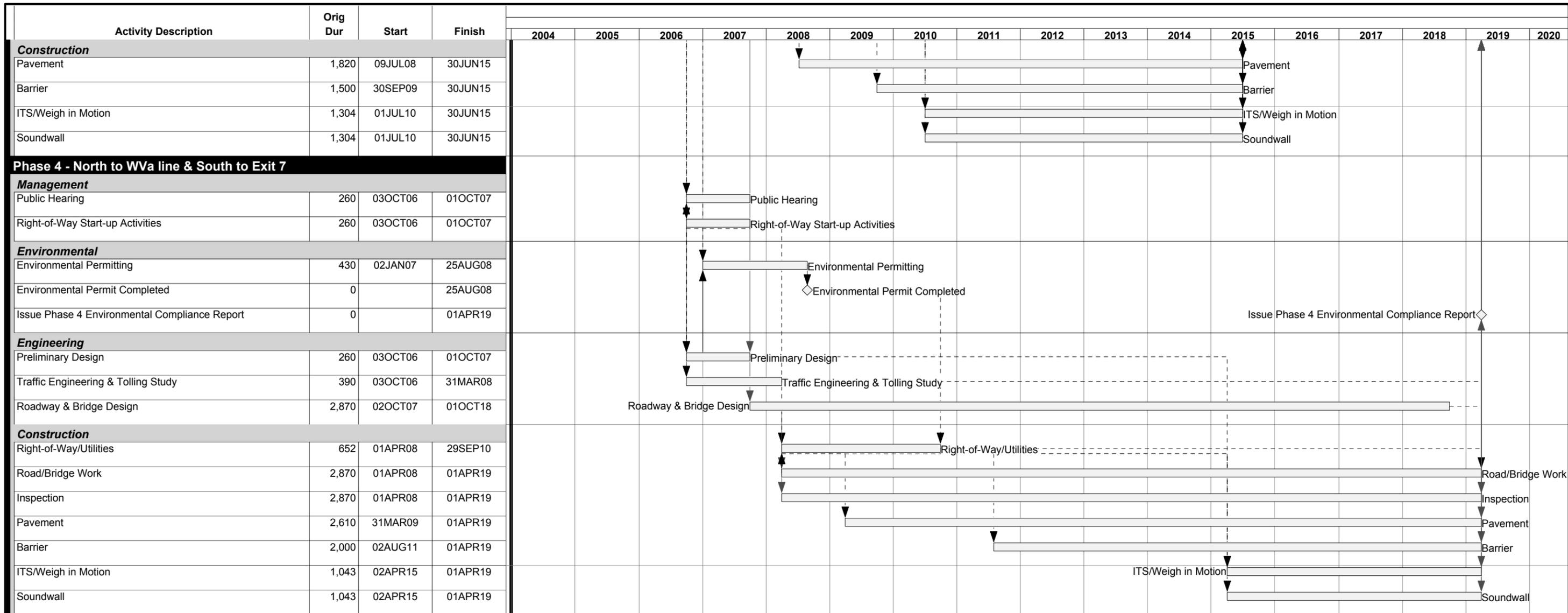
Phase Three - Detailed Proposal Improvements to the I-81 Corridor



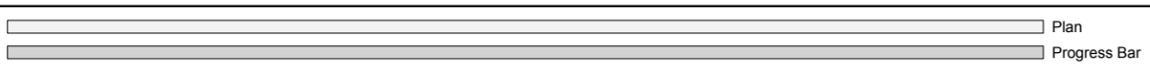
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Phase Three - Detailed Proposal  
 Improvements to the I-81 Corridor



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Phase Three - Detailed Proposal  
 Improvements to the I-81 Corridor

STAR Solutions



## Tab M Construction Process

***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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STAR Solutions will provide the managerial and technical expertise to effectively integrate the design with the construction process and complete the project within the time and cost allowed in the comprehensive agreement.

The primary objectives during the construction process will be to:

- Promote partnering with the designers and the construction contractors and their management groups at a level necessary to maximize team goals (A team building session will be held.)
- Staff the project with qualified personnel and contractors with experience and knowledge of the work and VDOT standards.
- Conduct frequent constructability reviews with the designers to assure best design for construction and eliminate rework and changes.
- Establish and promote efficient channels of communication to effectively integrate the design and construction process.
- Develop accurate, timely progress and reporting guidelines and procedures to closely monitor and track the construction process.
- Provide the resources and procedures to systematically review and inspect the construction methods, practices and products to ensure conformance to the project drawings and specifications, and to minimize costly rework.

As shown on our baseline schedule in Tab L, the construction phase will generally begin upon completion of the environmental phase and significant progress in the right-of-way acquisition and utility relocation phases.

### **Project Management**

The project's execution will be managed from STAR Solution's I-81 office to be secured shortly after award of contract. VDOT will be provided office space to use as needed at this location. All reviews, approvals and interfaces between STAR Solutions and VDOT will be managed from this location using state-of-the-art communications methods.

The project manager will mobilize the organization upon receipt of a Notice to Proceed. The team will finalize the execution strategy, prepare project coordination procedures and plans, initiate a constructability program, and perform value-engineering studies of preliminary designs.

The project manager will oversee the work of the operating centers. The project manager will reside at the main office but travel as necessary to ensure that all the engineering, fabrication and contractor offices are current with their work and reporting efforts. The project manager will use a functional management organization by providing key personnel responsible for the performance of the engineering, administration, contracts, construction, environmental, public relations, quality, safety and project controls. The key management and functional personnel will be selected based on their experience on large, complex projects and road and bridge experience to lead the performance of the major management and support functions of the project's organization.

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***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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A team-building session will be held with VDOT's team to reinforce relationships established during the bidding process and introduce new participants. As part of this teambuilding, STAR Solutions will conduct a formal execution strategy review to document the project objectives, VDOT's priorities, and align VDOT's and STAR Solutions' teams.

The project will develop and use Work Process Interface Diagrams (WPIDs) to define project interfaces between participants and support the interface coordination procedures. WPIDs are a KBR best practice.

The plans envisioned will include a coordination procedure defining the documents to be issued, the distribution of the documents and which documents will be approved by VDOT. Documents will be numbered in accordance with a standard project system, and will be managed using "Expedition" software. STAR Solutions will use existing in-place interface procedures to track, forward, advise, follow-up and archive documentation developed on the project. Weekly status meetings will be held to review engineering, procurement and construction status and issues. A monthly progress report will be issued to VDOT.

**Project Controls**

The project control function will be directed by the project controls manager located at the site-based office. The project plan and schedule will be developed with input and support from all stakeholders. Costs will be monitored and reported in the monthly progress report. Any changes will be managed and estimated under the direction of the project controls manager. The project controls manager will develop a project controls plan that will import standard reporting formats (from STAR Solutions entities) and merge them into a common reporting format.

With input from all stakeholders, the controls manager will develop the Work Breakdown Structure (WBS) to define all work for the purposes of planning, scheduling, budgeting, reporting and performance measurement. The controls manager will use existing in-place management systems to plan, schedule, track, measure performance and report on work progress for all participants by disciplines and by major work areas or major segments. Use of WBS coding will maintain consistency with the work plan, schedule and cost.

**Schedule**

The project scheduler will develop the overall project Critical Path Method (CPM) schedule. The optimum path of construction will be identified and all engineering, procurement and contracting activities will be logically sequenced to support it. All key project stakeholders will be involved in the planning process, and buy into the resulting schedule. This ensures that all are committed to meet the construction needs and key milestone dates.

The schedule will be issued early in the engineering phase and will be updated and reported monthly to reflect status against the plan. Additional detail will be developed as subsequent phases of the work are planned. These phases will incorporate early project experience. The scheduling program to be utilized on this project will be Primavera.

**Design Management**

An engineering manager responsible for that center's scope of work will report to the project engineering manager who, in turn, reports to the project manager. Lead engineers in each organization will direct the work in their respective disciplines, coordinating with their counterparts on a daily basis. They will facilitate the orderly execution of work among the centers.

***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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The three engineering centers will be coordinated in their work processes and procedures through an agreed discipline by the discipline coordination plan developed in the early stages of the work. This plan will identify the procedures to be followed, together with any project specific deviations that may be required. The work scopes of these centers will be monitored and controlled by the project engineering manager on a daily basis.

STAR Solutions considers the VDOT's design staff a valuable resource to be used for a portion of the design, providing this does not overload the Department's existing requirements. Periodic review of VDOT's backlog of design work during the engineering design phase should be undertaken to assess when and if VDOT's design staff can be utilized.

**Key action items include:**

- Contract and mobilize a geotechnical consultant
- Start development of site specific specifications
- Develop early drawing schedule for incorporation into EPC schedule
- Develop project procedures and execution plans
- Review potential bridge types for cost/schedule effectiveness
- Develop standard road profile(s) for approval
- Institute project correspondence and drawing standards
- Mobilize team members in accordance with work progress and schedule
- Review VDOT standards and specifications for inclusion in the work
- Ensure maximum designer and contractor understanding
- Create constructible designs
- Determine the areas of work overlap
- Verify that the scopes are complete, accurate and coordinated
- Allow for early phased construction
- Reduce errors and changes during construction.

**Construction Administration**

The construction manager will be an integral part of the project management staff during the pre-construction phase. Key construction personnel will assist in the preparation of construction contract packages, provide input into engineering, participate in the development of the detailed EPC schedule, and finalize construction execution plans. The construction manager will lead the constructability program in which extensive databases of productivity enhancement and safety in construction ideas are reviewed for possible value and applicability to the I-81 Improvement Project. Constructability ideas will be solicited from all team members. Timely inputs will be provided during the development of plans, specifications, drawings, and where applicable, vendor data. The construction manager will lead the "Opportunity for Continuing Improvements" program to encourage the development of project improvements throughout the life of the project. All parties to the project will have input to facilitate the integration of project improvements and lessons learned from this or prior projects.

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***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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In addition to providing input to the project controls procedures, the construction team will also help identify construction control areas (Work Breakdown Structures) during the early phase of design. All engineering design drawings will reference these control areas. The construction management team will participate in risk assessment of new materials and construction methods.

The mobilization of main construction forces will begin with the first contracts awarded. A thorough and logical mobilization plan is essential for the successful start-up of construction. This plan will detail all preparation, and pre-construction activities necessary to ensure timely arrival on-site of personnel, contractors and temporary facilities as required to properly support the construction efforts.

The following is a preliminary checklist of tasks to be performed during the pre-construction stage:

- Verify requirements for permits, licenses and other governmental authorizations
- Verify site access points
- Finalize Traffic Maintenance Plan for initial area
- Finalize Erosion and Sediment Control for initial area
- Finalize security plans
- Finalize locations for temporary facilities
- Finalize details for daily and weekly progress, personnel, construction plant and equipment reports
- Review material storage requirements
- Finalize details to be included in the loss prevention and safety program
- Finalize the proposed medical facilities
- Review and finalize site correspondence requirements and distribution of site documents
- Finalize arrangements for the provision of drinking and construction water, electrical power, and sewage waste disposal

In addition to the items listed above, there will be numerous other related items which will have to be investigated. The information gathered will be used for the final development of the pre-construction plans. The mobilization plan will be closely coordinated with the construction plan to ensure that mobilization activities properly lead and transition into initial construction activities.

Construction planning will include confirmation of the largest and heaviest pieces to be delivered to verify the requirements for heavy haul and erection. Heavy haul routes will be established. A sequence of heavy lift transport and erection will be developed.

**Quality Assurance/Control**

The project team will advise VDOT regarding any construction problems out of the scope of the comprehensive agreement and recommended courses of action will be developed and implemented as required. STAR Solutions will document and advise VDOT of any and all non-conformances, as well as describe how the team is dealing with each non-conformance.



***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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STAR Solutions has developed quality control and quality assurance plans that will help control design and construction work, materials furnished and materials used on the project. Our objective in detailing this process is to develop quality plans and construction products that meet VDOT standards, procedures and policies.

The QA Manager, assisted by a third-party inspection company, will be responsible for providing quality assurance and control inspection to confirm that improvements conform to the approved drawings, specifications and related documents.

VDOT standards and specifications, including any project supplemental specifications specifically identified in the comprehensive agreement documents between VDOT and STAR Solutions, will at all times govern the construction of this project.

The QA Manager, working in concert with the design team, will be the interpreter of these requirements, unless otherwise directed by VDOT. The QA Manager, working with the Engineer of Record, will certify that all construction has been performed in accordance with the approved plans and specifications.

To protect the interest of VDOT as specified by the design-build contract, a quality assurance and control inspection plan (QA/CIP) will be implemented to address and define inspection and reporting responsibilities. This program is defined in detail in the QA/QC plan located in Tab N of this submittal.

**Inspection and Record Keeping**

The QA Manager will be responsible for monitoring the construction activities for contractor compliance to the QA/CIP and to provide the necessary documentation and coordination of all construction engineering, inspection and testing of construction materials and construction. QA/CIP manpower requirements will be determined by the QA Manager based on the contractor's construction schedule and the need to adequately and properly monitor the work to be certified as required by the Comprehensive Agreement and the project's approved schedule.

The QA Manager's inspection personnel will use the Construction Work Book (CWB) and Materials Work Book (MWB) or Site Manager computer programs. All project documentation will be in accordance with established VDOT procedures and requirements.

Independent materials testing agencies will furnish technicians, equipment and facilities to perform laboratory tests of fabricated and non-fabricated materials used in the construction of this project. The independent materials testing agency staff will be VDOT-certified in the specific area of expertise they have been hired to perform.

The QA Manager will provide engineers, senior inspectors, inspectors, and inspector trainees for the implementation and coordination of the approved QA/CIP and to monitor, test, supervise, review and coordinate the construction inspection and testing program for the Improvements to the I-81 Corridor project. The QA Manager will provide a materials coordinator who will be responsible for coordinating the proper inspection coverage and documentation of materials certifications. All QA Manager staff will be VDOT certified in hydraulic cement, asphalt cement pavement, central mix aggregate, soils compaction, nuclear safety, DCR and flagger certification. Troxler certification may be an acceptable alternative for nuclear density inspection of compacted soils and asphalt concrete.



***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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The project inspectors will maintain daily general diaries. Using the CWB and MWB or Site Manager computer program, the project inspector will document phase-inspected items as required in the Comprehensive Agreement. For example, the inspectors will perform the following to observe and record conformance with plans and specification:

- Review and verify that materials test results conform to contract requirements
- Coordinate inspection of bearing for pile foundations with the geotechnical firm selected by STAR Solutions
- Monitor prestressed concrete beam erection
- Monitor concrete curing
- Inspect deck and substructure concrete placement
- Review maintenance and protection of installed traffic control devices
- Inspect erosion and siltation control devices and coordinate storm water management-related matters
- Compaction testing of engineered fills, including embankment, backfills and pipe trenches
- On-site concrete testing consisting of slump, air entrainment, temperature and making of concrete test cylinders
- Compaction testing of base courses and asphalt pavement
- Inspections of utility installations within the right of way
- Receive and check subcontractor's material certifications and samples for conformance
- Inspect delivered materials and equipment
- Inspect work in progress
- Witness field-testing of construction materials
- Make control tests to support the methods or equipment of any independent testing agency
- Monitor contractors work to ensure conformance with OSHA Safety requirements

The QA Manager will coordinate and receive all test results and reports for the following services from the off-site laboratories and plant inspectors:

- Laboratory testing of concrete cylinders
- Shop inspection of prestressed concrete beams
- Monitoring of concrete, asphalt and crusher plants
- Certifications from FOB job site provided materials

All inspection requirements will be documented in writing. The project inspector will maintain all reports of all Quality Control Tests.

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***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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Among the items to be shown on the report are:

- Description of work
- Type of test and specification reference
- Agency and inspector performing the test showing location, time, date and equipment use
- Sample source and date secured
- Results of test
- Recommendation as to acceptance or rejection
- Signature of responsible person controlling the test
- Approval or rejection by the QA Manager.

A monthly report will be prepared and given to STAR Solutions' management team providing the overall status of the QA/CIP, including work performed, items inspected, unsatisfactory items inspected, corrections of unsatisfactory items and percentage complete.

**Staffing**

After the execution of the comprehensive agreement, STAR Solutions will immediately begin the necessary design, environmental, right-of-way and utilities phases of this project. The construction team will be organized and begin interaction with engineers and scientists to form the necessary partnerships for the design-build type process. During the construction phase, staff members will be on-site to direct and manage the project.

**Community Relations**

During design, environmental, right-of-way and utilities, and construction, the process involves proactively communicating with and providing information to the local municipalities, businesses and adjacent property owners. A process will be established with the Project and Construction Management team for ensuring that the Community Relations staff is regularly updated on project progress. The Community Relations staff will develop and implement communications tools for the public. For instance, a web site will be developed to provide timely and accurate information about the corridor, especially issues involving changes in traffic movements and special events (university events and festivals). Project newsletters will be distributed on a regular basis to interested members of the communities. A project hotline will also be set up to allow the public to voice their opinions and concerns.

**Assignment of Responsibilities**

STAR Solutions will ensure that the requirements and assignment of responsibilities for safety, temporary project facilities, equipment, materials and services for common use of contractors are provided. Engineer and contractor coordination is a critical element to keep work flowing and minimize disputes. STAR Solutions will ensure the flow of information between the preliminary engineering phase and the construction phase is on time and smooth.

**Safety**

STAR Solutions and its subcontractors are responsible for the safety of their operations and their employees and the traveling public. Members of the STAR Solutions team all have outstanding safety records. The project will have a written safety program that will be in compliance with all federal, state and local regulations. Non-compliance will be dealt with immediately. It is the intent of the project management that the only acceptable goal for the project is "zero incidents" and all project team members will work to achieve that goal.

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***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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An extensive safety orientation review will be given to each employee prior to the start of work. Safety will be stressed in each and every meeting by the first action at each meeting being a safety moment. The contractors will conduct weekly safety meetings and give specific safety, environmental and work practice instructions at the beginning of work each day and also for other tasks undertaken during the workday.

**Submittals and Contract Documents**

Submittals, if not properly handled, can cause confusion and create job delays. STAR Solutions will establish procedures for the submission and approval of submittals as well as the timeframes required. A complete record set of all approved shop drawings and submittals will be maintained and turned over to VDOT at the completion of the project.

STAR Solutions will maintain a complete set of contract documents, updated with changes as they occur. Additionally, STAR Solutions will maintain records on an ongoing basis, including the following:

- Purchases
- Materials
- Equipment
- Applicable handbooks
- Appropriate standards and specifications
- Other related documents and revisions arising out of the contract work

**Changes**

This design-build project concept with a fixed price and schedule is specifically designed to minimize major changes to the project scope; therefore, we anticipate any changes to be minimal. However, changes that are necessary will be handled in accordance with the applicable sections of the comprehensive agreement with VDOT.

**Progress Meetings and Reports**

The team intends to fully comply with new requirements adopted by the General Assembly this year as part of Governor Warner's VDOT reform package to increase public accountability for transportation projects. These activities include:

- A detailed financial plan for all projects in excess of \$100 million, prior to the project moving forward. This plan would include a complete cost estimate for all major project elements, an implementation plan with the project schedule and cost-to-complete information presented for each year, revenues identified by funding source made available each year to meet project cost, and a detailed cash flow analysis for each year of the proposed project.
- Quarterly reports to the public and the General Assembly on the current status of every highway construction project. The quarterly reports will include up-to-date cost, expenditure and schedule information on every project. These reports would be posted on the VDOT and STAR Solutions I-81 websites.
- Coordination of state resources from economic development, natural resources, and transportation agencies with localities in developing sound transportation planning components in local comprehensive plans.



***Provide a detailed construction process to include the inspection and record keeping standards and requirements to be used.***

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Our goal is to work closely with VDOT, local governments and other stakeholders throughout the negotiation and construction process to keep the citizens of Virginia informed.

**Close-Out**

Once each project phase is substantially completed as designated in the Comprehensive Agreement, STAR Solutions will prepare a final report, review all record drawing information as well as warranties for completeness, and will ensure that proper procedures are followed for substantial completion and final completion of the work.



## Tab N QC/QA Plan

### *A detailed QC/QA process which specifies the roles of each party, including VDOT.*

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#### **Introduction**

A Quality Assurance/Control Inspection Plan (QA/CIP) for I-81 will be fully developed to specify individuals, roles, responsibilities, authorities and detail activities necessary to ensure a high-quality project is designed and constructed. The quality acceptance on I-81 will meet or exceed FHWA's, VDOT's and the warrantors' specified minimum standards and include sufficient documentation to confirm quality. The project QA Manager will have full autonomy necessary for decision-making based solely on quality, which includes input from a third-party independent assurance source. Since this proposal includes a 20-year warranty, the ultimate risk of performance is shifted to the warrantor, ensuring that a forward-looking view of quality is ensconced throughout the decision process. Additionally, each firm participating on the project will provide a Quality Control Manual (QCM) describing resources and activities that ensure that quality plans, materials and construction techniques are employed. Figure N-1 on the following page highlights the organizational structure of our quality assurance team.

#### **Organization**

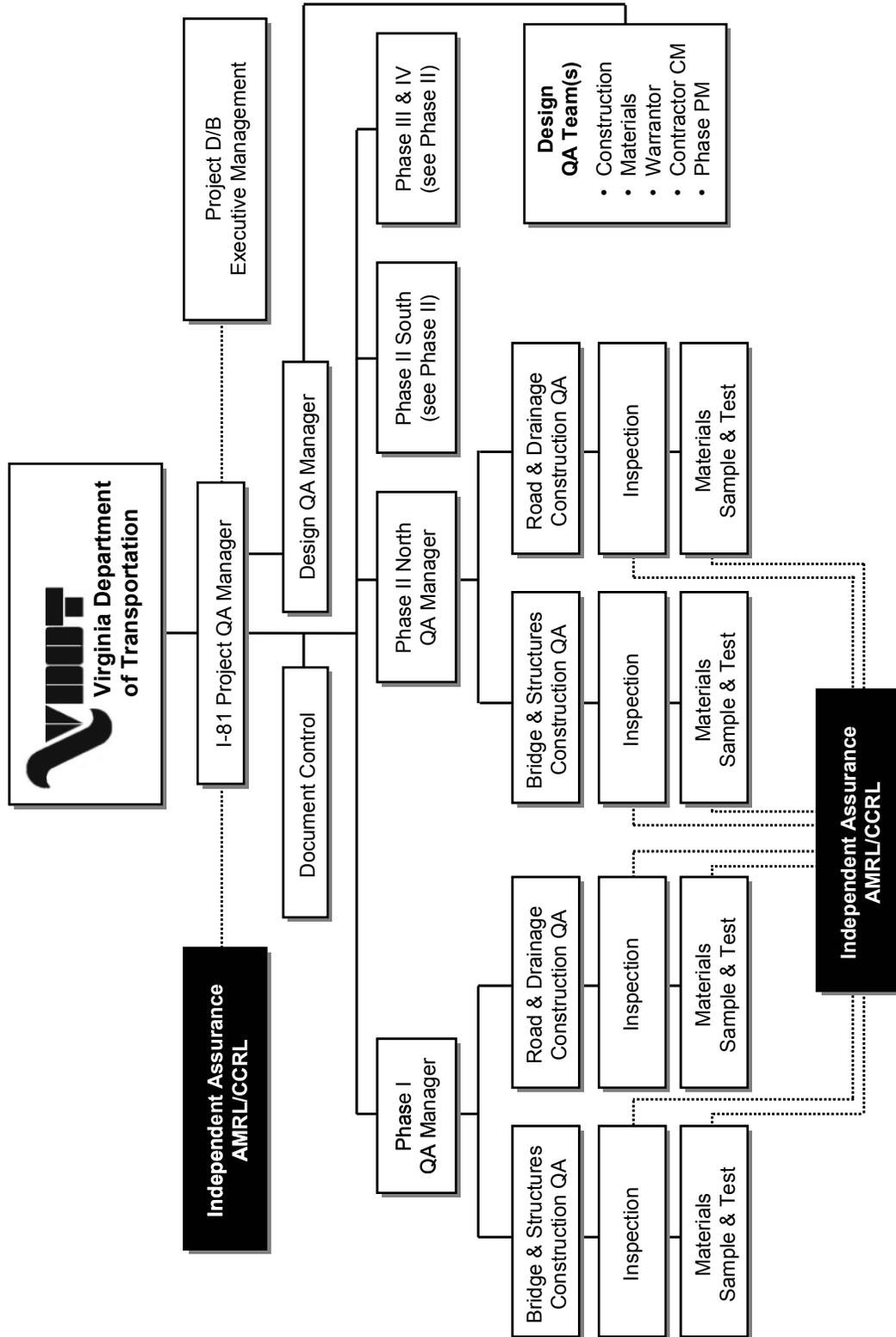
The QA Manager will lead the organization of multiple teams representing each phase of construction. The QA Manager will ensure project-wide uniformity in administration and determination of acceptance. A project-wide system for tracking materials acceptance will be managed by a materials coordinator as a component of document control. Each phase of construction will include a team led by the phase QA Manager who will direct and coordinate the work of inspection, testing and materials acceptance. The phase QA Manager will report directly to the project QA Manager. Each phase team will be organized around the work to be completed. Assignments will generally fall into the categories of bridges and structures, and roadway and drainage. In all cases, sufficient oversight will be provided to ensure the work is conducted in compliance with plans, permits and special provisions by proper acceptance sampling, testing and inspection.

#### **Authority**

Quality assurance will be provided as an integrated feature of the comprehensive design-build agreement, accountability through VDOT and the Executive Management team. Acceptance decisions will be made within the framework of the I-81 QA/CIP. VDOT will have review and approval authority for this project-wide QA/CIP plan. To satisfy 23CFR637 regulations, a third-party independent assurance firm will be provided with AMRL/CCRL certified laboratory and inspection services, and will report directly to the QA Manager. The focus of third-party independent assurance testing will be to determine conformance to plans and specifications; and to compare the QA test results to ensure accuracy is being achieved through all testing and inspection activities. The QA team will proactively identify deficiencies in design, environmental, safety and construction activities, initiate corrective action when necessary, and stop noncompliance work in progress at any time throughout the project. The singular goal of the QA team is to ensure the quality of work accurately meets or exceeds the contract documents.

A detailed QC/QA process which specifies the roles of each party, including VDOT.

Figure N-1: I-81 Quality Assurance Organization





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***A detailed QC/QA process which specifies the roles of each party, including VDOT.***

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**Coordination with VDOT**

The I-81 QA team will leverage the capabilities of VDOT by continuing the partnership with the private sector that has been created by the Materials Division to track certified source acceptance materials and provide specialty testing when necessary and mutually beneficial. The I-81 QA team will provide for reimbursement of materials testing done by VDOT for specialty products such as elastomeric bridge bearing pads, liquid membrane curing compound, or geotextiles to name a few. VDOT, at its discretion, may inspect and test any element or material on the project as needed. The QA Manager will coordinate with construction to ensure access is available. As an option, VDOT may provide the independent assurance inspection and testing activities. Regardless of election to conduct the independent assurance sampling and testing (IAST) with VDOT forces or STAR Solutions contracting with a third-party certified provider, the value of this work will be recognized and accounted for in the estimated costs of constructing I-81.

**I-81 QA Design**

The design quality program will begin with a project-wide QA design plan that incorporates the objectives and goals set forth in the comprehensive agreement, provide oversight to each individual firm's QC design plan and include roles, responsibilities, authorities and standards for all design elements. Each completed design product will be double-checked to ensure conformance to governing standards and elimination of drafting, translational or computational errors. A team composed of representatives in construction, materials and the warrantor will provide a thorough review of each design product.

As an independent review, the Phase I Design QA Manger will review and check the Phase II designs and vice versa. Specific elements include:

- Provide a project-wide QA design plan that includes all standards, specifications and communications necessary to ensure efficient submittals and approvals.
- Design QA will ensure that plans comply with FHWA and VDOT standards, policies and guidelines.
- Design QA will ensure accurate submittals and communications with VDOT and/or FHWA.
- QA review team will check computations, quantities, and constructability.
- Construction Project Mangers, Design QA Managers and Field Engineers will review to eliminate errors, improve constructability and resolve mistakes or poor assumptions.
- Conduct audits of design documents with in-depth reviews to ensure conformance.

**I-81 QA Construction**

The construction QA program will begin with implementation of the I-81 QA/CIP. The QA/CIP provides VDOT with all processes and systems, and defines inspection and reporting responsibilities that will be implemented throughout the corridor. The engineers, inspectors and technicians will use this plan to ensure compliance with plans, specifications and special provisions on all materials incorporated and elements constructed on I-81. Specific elements include:

- Conformance with title 23CFR637—qualified personnel and qualified labs
- Staffing levels sufficient for inspection of all operations
- Sampling and testing frequencies to ensure compliance with plans and specifications
- Regularly-scheduled meetings, including both pre-construction meetings to ensure clear

***A detailed QC/QA process which specifies the roles of each party, including VDOT.***

expectations; and quality meetings to inform VDOT and/or FHWA of project quality and conformance

- Identification and notification of environmental and safety deficiencies
- Identification and resolution of deficient work
- Inspection and certification of off-site prefabricated materials
- As-built documentation—complete document tracking system
- Materials certification database, including all tests, re-tests and acceptance decisions
- Inspection and testing training to leverage current quality knowledge
- Measuring and testing equipment calibration standards
- Audit of Quality Control programs for all subcontractor construction activities
- Final acceptance decisions for materials incorporated and construction completed
- Work performed, inspection and/or test results, and acceptance or rejection decisions will be documented and tracked in a computer system such as Site Manager or other similar system
- Tools such as Quality Builder software will be used for tracking materials quantities, quality and placement information
- Digital photo records and PDA based inspection documentation will be utilized

The quality program will enhance the finished product by ensuring that quality designs are prepared, qualified personnel inspect and test incorporated materials, and complete documentation is provided to ensure conformance to all contract documents. The 20-year warranty improves all quality by carrying over means and methods that influence all elements of construction. Ultimate quality is guaranteed by the proper execution of construction enabling the full transfer of performance risk to the D/B team warrantor.



*Inspector testing soil strength with a Geogage*

**QA/CIP Manual Outline**

- I. Organization and Responsibilities
- II. Inspection and Administration
- III. System Implementation
- IV. Appendices
  - A. QA Organization
  - B. Safety Plan
  - C. Environmental Monitoring and Reporting Plan
  - D. Baseline Schedule
  - E. Nonconformance Notices and Reports
  - F. Frequency of Materials Testing Schedule

***A detailed QC/QA process which specifies the roles of each party, including VDOT.***

- G. Inspection and Materials Testing Responsibilities
- H. Document Tracking System
  - 1. Emergency Numbers
  - 2. Notice of Unsafe Conditions
  - 3. Submittal Transmittals
  - 4. Request for Information (RFI)
  - 5. Job Mix Formula Adjustment Request
  - 6. Bridge Deck Inspection
  - 7. Clearing and Grubbing Inspection
  - 8. PCC Placement Inspection
  - 9. Concrete Pour Log
  - 10. Pipe, Underdrain and Drainage Inspection
  - 11. Siltation Control Inspection
  - 12. Subgrade Inspection
- I. Special Provisions
- J. Inspection and Testing Forms

**Schedule**

The QA team will commence immediately with production of the QA/CIP manual, discussions with the VDOT Materials Division and any revisions necessary to implement a project-wide system for inspection, testing and acceptance. The design QA efforts will likewise begin in conjunction with design efforts to ensure that consistent uniform standards are in place for all work designed throughout the corridor. Baseline schedules loaded with and linked to quantity estimates, inspection requirements, sampling and testing requirements will be included to manage staffing and resources. Monthly refinements to the schedule will be made to capture any changed conditions or improvements in estimated quantities. Managing these changes will ensure that sufficient oversight is planned for and executed.



*Inspector checking density of HMA*

Initially, three construction QA teams will begin in 2007—one team for Phase 1 and two teams for Phase 2 according to the proposed schedule. In 2008 and 2009, additional QA teams will be added for Phase 3 (one new team each year) and Phase 4 (one new team and one of the teams from Phase 1) to ensure sufficient oversight is provided. The initial assumption requires a total of six teams operating at the same time during 2009-2012. This may increase to accommodate unforeseen schedule changes. Additional resources may be required in certain areas such as Phase 3 south from MP 84 to 156. Depending upon the schedule of work, it may be more sensible to have two separate teams working this phase. Manpower requirements will be



***A detailed QC/QA process which specifies the roles of each party, including VDOT.***

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determined by the QA Manager and assigned based on the construction schedule to adequately and properly monitor all work performed on the corridor. Weekly meetings will be held to coordinate and disseminate schedule information, provide training and emphasize safety to the QA teams.

**Safety and Environmental Compliance**

Safety is the cornerstone of every good project. The I-81 QA teams will be a trained and safe staff, compliant with project-wide safety practices, and vigilant in encouraging best practices by all individuals on the project work site. Whenever the QA team observes unsafe conditions, they will immediately make the responsible party in charge aware of the problem. If after notification, satisfactory correction are not made in a timely manner, the Contractor's Safety Superintendent will be notified and, if necessary, operations will be suspended by the QA Manager until the situation is resolved. Erosion and sedimentation compliance will be monitored, documented and corrected whenever deficiencies are identified during field inspection. Similarly, failure to conform to the VPDES and other permit requirements may result in suspension of work by the QA Manager.

## Tab O Cost Estimating Methodology

***The project cost estimating methodology. Specify whether the cost estimate is stated in current or inflated dollars. If inflated, indicate the inflation factor(s) used. Provide a breakdown of the project cost estimate by phase. Address the need for items excluded from the cost estimate provided in the conceptual proposal, including but not limited to right-of-way for truck ramps, abatement of hazardous materials, contaminated soils, sound walls, utility relocation, permanent lighting and replacement of existing under-crossings.***

The project cost estimate at this point in time represents an order of magnitude value based on a conceptual design. The estimate includes costs for the new right-of-way requirements, sound walls, utility relocation, permanent lighting at appropriate interchanges, and replacement of existing under-crossings as cited in VDOT's Study Books for I-81.

The STAR Solutions' design team has developed major quantities of work to which average unit prices have been applied. The average unit prices are based on VDOT history where appropriate and include an estimated value for all identified items of work with the exception of abatement of hazardous material, contaminated soils and replacement of any existing drainage features that are not required to be replaced or adjusted as a part of the widening and rehabilitation of this route.

The basic assumptions and criteria used in developing the cost data are as follows:

- The estimates were prepared using 2003 dollars
- Adequate experienced craft labor is available
- Normal productivity rates as historically experienced will be utilized
- There are sufficient experienced contractors available to perform the work
- Virginia's weather impacts to construction schedule and costs will be typical
- Existing state-of-the-art construction technology will be utilized

Below is a breakdown of the STAR Solutions estimated project costs by phase, as well as a detailed estimate of services by phase:

**Figure O-1: Project Costs by Phase**

Phase 1	Phase 2	Phase 3	Phase 4	TOTAL
\$666,006,420	\$725,792,807	\$2,265,637,578	\$2,063,195,522	\$5,720,632,326



*The project cost estimating methodology. Specify whether the cost estimate is stated in current or inflated dollars. If inflated, indicate the inflation factor(s) used. Provide a breakdown of the project cost estimate by phase. Address the need for items excluded from the cost estimate provided in the conceptual proposal, including but not limited to right-of-way for truck ramps, abatement of hazardous materials, contaminated soils, sound walls, utility relocation, permanent lighting and replacement of existing under-crossings.*

**Figure O-2: Cost of Services by Phase**

	Phase 1	Phase 2	Phase 3	Phase 4	TOTAL
Environmental	3,133,333	3,266,660	8,133,290	6,466,717	21,000,000
Engineering	34,247,594	36,989,580	117,726,369	110,333,871	299,297,414
Engineering & Program Management	46,282,538	50,769,761	152,410,017	138,204,584	387,666,900
Geotechnical	6,658,333	6,941,667	17,561,782	13,888,218	45,050,000
<b>ENGINEERING &amp; MANAGEMENT COST</b>	90,321,798	97,967,668	295,831,458	268,893,390	753,014,314
Road/Bridge Work	239,888,606	290,640,566	1,097,838,537	1,077,580,417	2,705,948,127
Pavement	199,469,183	207,957,233	526,112,774	416,060,810	1,349,600,000
ITS/Weigh-in-Motion	14,144,784	14,747,010	36,715,987	29,192,220	94,800,001
Soundwall	3,016,921	8,647,171	42,067,653	30,768,255	84,500,000
Tolling	38,631,000	15,450,400	15,452,400	7,726,200	77,260,000
Inspection	23,730,798	29,267,093	110,147,735	110,362,587	273,508,214
<b>CONSTRUCTION COST</b>	518,881,293	566,709,473	1,828,335,087	1,671,690,489	4,585,616,342
<b>SUBTOTAL ENGINEERING &amp; CONSTRUCTION</b>	609,203,091	664,677,141	2,124,166,545	1,940,583,879	5,338,630,656
Right-of-Way	50,964,765	53,914,989	114,371,034	95,458,782	314,709,570
Utilities	5,838,564	7,200,677	27,099,999	27,152,860	67,292,100
<b>SUB TOTAL</b>	<b>\$666,006,420</b>	<b>\$725,792,807</b>	<b>\$2,265,637,578</b>	<b>\$2,063,195,521</b>	<b>\$5,720,632,326</b>
PAVEMENT WARRANTY	\$106,599,157	\$103,264,019	\$237,262,315	\$213,374,252	\$660,499,743
<b>TOTAL</b>	<b>\$772,605,577</b>	<b>\$829,056,826</b>	<b>\$2,502,899,893</b>	<b>\$2,276,569,773</b>	<b>\$6,381,132,069</b>

## Tab P Commitments and Obligations

***Any anticipated commitments/obligations from all parties: equity, debt or other financing mechanisms, appropriations, highway allocations or any other public sector resources. Include the schedule of project revenues and ongoing project operating and maintenance costs.***

Following is a description of the capital funding sources, STAR Solutions contributions and ongoing VDOT operating commitments for STAR Solutions' I-81 Project.

### **Capital Funding Sources**

STAR Solutions' proposed plan of finance in this Detailed Proposal for the I-81 Project provides funding of all of the estimated project costs discussed in Tab O. We have included three principal capital funding sources for development, design and construction of the project:

- Federal funds that are earmarked for dedicated lanes for Heavy Commercial Vehicles on I-81 in Virginia
- Resources deriving from net toll revenues. These result from an "Interim Toll" charged on Heavy Commercial Vehicles during the construction of each Phase of the I-81 project as well as a "Completed Toll" charged on Heavy Commercial Vehicles that use each completed Phase, each net of toll collection and administrative costs. These resources are composed of four types of funds:
  - Tax-exempt Toll Revenue Bonds ("**Bonds**") issued by a special purpose non-profit entity
  - TIFIA credit assistance obtained by STAR Solutions in the form of four tranches of a subordinated direct loan ("**TIFIA Loans**") secured by net toll revenues available after meeting funding requirements for Bonds
  - Net Toll Revenues that are available during the construction period after meeting all funding requirements for Bonds and TIFIA Loans
  - Investment Earnings on balances in the project's construction account and other funds and accounts related to the Bonds
- Funds that the Commonwealth Transportation Board ("**CTB**") has allocated and plans to allocate for I-81 Corridor projects in the current Virginia Transportation Development Plan

Each capital funding source is described below. The annual amount of each type of resource included in the preliminary finance plan is identified in Exhibit 1 in Tab T.

**Federal Earmarks.** STAR Solutions proposes to partner with VDOT, FHWA, the Virginia Congressional delegation and Congressional leadership to secure ongoing earmarks for the I-81 project in future federal reauthorizations of the Transportation Equity Act for the 21st Century ("**TEA-21**"). As VDOT is aware, STAR Solutions has continued to work aggressively on this objective during the past nine months and is pleased to report substantial interest on the part of Congressional leadership. This demonstrates that a project of this scope and magnitude will be recognized by Congress in providing significant economic benefits to the Commonwealth and the nation as well as improved safety and reliability to all users of I-81. Our preliminary financing plan includes receipt of \$1.6 billion of anticipated earmarked funds from the next two federal surface transportation program authorizations.



***Any anticipated commitments/obligations from all parties: equity, debt or other financing mechanisms, appropriations, highway allocations or any other public sector resources. Include the schedule of project revenues and ongoing project operating and maintenance costs.***

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Our preliminary plan of finance for the project:

- Allows partial funding of the needed federal funds in the next six-year federal authorization
- Anticipates that annual funding amounts will be spread throughout each re-authorization period
- Commits us to partner with VDOT to obtain earmarked funds in the subsequent six-year federal transportation authorization

Any State matching requirements for the proposed federal earmarks could be satisfied either through VDOT appropriations of “hard match” or through the “soft match” represented by the Toll Revenue Bonds.

***Toll-Based Resources.*** Receiving designation from the Federal Highway Administration as a pilot project that authorizes charging tolls on an existing Interstate highway, pursuant to Section 1216(b) of TEA-21, is essential to implementation of STAR Solutions’ proposed project. Our preliminary plan of finance meets the existing statutory requirement that toll revenues be used only for debt service, reasonable rates of return on investments, and costs necessary for the improvement and proper operation of maintenance of I-81. Use of excess toll revenues to reimburse VDOT for expenses that VDOT incurs for Asset Management of I-81 and capital contributions to the project also is consistent with this statutory requirement. Considering both the merits of this project and Virginia’s conditionally accepted application, we are confident that FHWA will award I-81 pilot project designation. STAR Solutions is prepared to begin working immediately with VDOT to amend, if necessary, its 2002 application to the U.S. Secretary of Transportation.

***Toll Revenue Bonds.*** STAR Solutions’ plan of finance includes periodic public issuances of Bonds during the 15-year project implementation period. STAR Solutions proposes to establish a “63-20” non-profit organization with authority and responsibility for issuing the tax-exempt Toll Revenue Bonds. These Bonds will be fully non-recourse to the Commonwealth or any of its political subdivisions.

The Bonds will be secured by a senior lien on net toll revenues that are available after funding the costs of toll collection and administrative costs of the 63-20 organization. Our preliminary plan of finance reflects sizing of Bonds based on 150 percent coverage of annual debt service from projected net revenues. STAR Solutions has had preliminary discussions with Fitch Ratings concerning our proposed plan of finance and believes the projected \$5.9 billion of Toll Revenue Bonds can reasonably be expected to achieve an investment grade credit rating, given the substantial existing traffic on I-81, the lack of alternate routes that could cause diversion of traffic from the corridor, and the preliminary estimates of net toll revenues that have been prepared to date. This conclusion is subject to confirmation after preparation of investment-grade traffic and toll revenue studies, which need to be completed prior to the issuance of the Bonds.

***TIFIA Loan.*** STAR Solutions’ preliminary plan of finance incorporates direct loans under the U.S. Department of Transportation’s (“USDOT”) TIFIA program or its successor. STAR Solutions expects to be responsible for applying for the TIFIA credit assistance. Repayment of the TIFIA Loans, like the Bonds, will be entirely nonrecourse to the Commonwealth of Virginia or its political subdivisions. As for the Bonds, a TIFIA Loan is anticipated to fund a portion of the cost



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of each Phase of the project and is assumed to be committed to when all needed financing for each Phase is arranged. The TIFIA Loans will have a junior lien on net revenues. The TIFIA Loans either can be a direct funding source for project costs or, subject to favorable market conditions, can be used to help secure low-cost tax-exempt construction financing as Citigroup and Lehman Brothers did for the Central Texas Turnpike System in August 2002. The latter structure enables STAR Solutions to issue highly-rated tax-exempt Bond Anticipation Notes (“**BANs**”) for construction financing of this portion of project costs. Each TIFIA Loan would be drawn one year after the end of construction of each Phase and used to repay the BANs. Although the amount of TIFIA credit assistance provided to a project may fund up to 33 percent of eligible project costs under current law and regulations, our preliminary financing plan for the Base Proposal assumes the TIFIA Loans will fund only approximately 13 percent of the total project costs of the I-81 project.

Based on our meetings with the Governor’s Advisor for Transportation Reauthorization and staff of the TIFIA Joint Program Office at FHWA during the past two years, STAR Solutions believes that our project will be an attractive candidate for TIFIA assistance. The project directly satisfies most of the TIFIA program’s statutory criteria, including:

- The project running “border-to-border” and having regional significance
- The project’s strong credit as represented by tolling of existing commercial traffic in a heavily-traveled corridor
- Use of a public/private partnership under the Commonwealth’s well-established PPTA program
- Accelerated project development and completion
- State-of-the-art, open-road, 100 percent electronic toll collection (“**ETC**”) system
- Reduced congestion, increased safety and improved air quality
- Reduction in the amount of Federal grants that otherwise would have been needed to reconstruct and widen I-81 as a non-toll highway

The minimum coverage allowed by the USDOT in the TIFIA Program is 110 percent of aggregate Bond debt service and TIFIA repayments. Because the I-81 project involves improvement of an existing high-traffic Corridor, STAR Solutions’ preliminary financing plan assumes minimum projected 115 percent coverage of aggregate debt service. Our preliminary financing plan also assumes that each TIFIA Loan is structured to have a final maturity that is 35 years after the substantial completion of the respective Phase funded by that TIFIA Loan and that the initial repayment of each TIFIA Loan will be deferred until five years after the completion of the respective Phase. This delayed amortization feature assists the project in completing its phased openings. These structural features will be subject to negotiation with TIFIA after the plan of finance is further developed after receiving investment grade feasibility studies.

*Pay-As-You-Go Toll Revenues.* As described in Tab S, STAR Solutions proposes to collect the Interim Toll on Heavy Commercial Vehicles on any Phase of I-81 that has received full environmental clearance and that is under construction. The Interim Toll will be replaced by the Completed Toll upon the completion of the Phase.



***Any anticipated commitments/obligations from all parties: equity, debt or other financing mechanisms, appropriations, highway allocations or any other public sector resources. Include the schedule of project revenues and ongoing project operating and maintenance costs.***

Any toll revenues that are not required during the project implementation period to: (i) pay costs of toll collection or 63-20 administration, (ii) fund debt service and reserves for Toll Revenue Bonds, (iii) meet funding requirements of the TIFIA Loan and (iv) fund replacement of toll collection facilities, would be used to pay project costs.

*Investment Earnings.* Investment income on cash balances in STAR Solutions' or 63-20 funds and accounts will be applied to project costs to the extent not needed to pay interest during construction or to fill-up reserves.

***CTB Allocations.*** The current Virginia Transportation Development Plan for fiscal years 2004-2009 identifies approximately \$114 million of resources that are allocated or planned for allocation for various projects on I-81, exclusive of funds earmarked for (a) development of the NEPA document; (b) PPTA project development and management; and (c) projects that are currently under construction or completed. We have further reduced this amount by 14 percent to \$98 million, reflecting an assumption that a portion of the resources has already been expended, consistent with our prior analysis in our Conceptual Proposal.

Our preliminary plan of finance assumes that VDOT will make these \$98 million of funds available to STAR Solutions for project costs during the 2004-2009 period in equal annual amounts. STAR Solutions' plan of finance assumes that no additional VDOT funding will be available for STAR Solutions' I-81 improvements during the remainder of the project implementation period (2010-2018). In the event VDOT chooses to provide a higher amount of participation, such resources could be used to reduce the toll rate on Heavy Commercial Vehicles and/or fund additional improvements to I-81.

In addition, STAR Solutions believes that it is important to the feasibility and acceptability of the project to have active VDOT participation in the review of plans and testing results and the monitoring of construction throughout the life of the project. Such "in-kind" contributions will provide a critical level of input and coordination for the project and be considered by the capital markets and TIFIA as tangible support by the Commonwealth, without encumbering the Commonwealth's balance sheet.

STAR Solutions would agree to undertake reimbursement of all or a portion of such VDOT contributions, if additional toll financing capacity were available after the completion of all four Phases of the project. In addition, it is possible that VDOT contributions could be repaid from excess toll revenues after the completion of the project, subject to the terms and conditions included in the bond resolution for the Toll Revenue Bonds and TIFIA Loans.

***Additional Capital Funding Sources.*** Although not part of our plan of finance, STAR Solutions anticipates that additional funding sources may also be available to:

- Reduce the projected toll rate on Heavy Commercial Vehicles
- Accelerate development of I-81 improvements
- Fund additional improvements to I-81
- Reduce federal or State contributions



***Any anticipated commitments/obligations from all parties: equity, debt or other financing mechanisms, appropriations, highway allocations or any other public sector resources. Include the schedule of project revenues and ongoing project operating and maintenance costs.***

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For example, the proposed toll collection system will utilize fiber optic cable in the I-81 right-of-way. STAR Solutions will maximize the value of this fiber and apply any lease receipts achieved during the project implementation period to project costs. Additional resources may be available from the Intelligent Transportation Systems program, the National Corridor Planning and Development Program, the Coordinated Border Infrastructure Program, homeland security appropriations for emergency preparedness/evacuation readiness, or other federal programs that may be created during the development period.

In addition, if the Commonwealth decides that tolls will be charged on all vehicles using all or a portion of I-81, substantial additional capital funding resources could be generated. For example, we estimate that tolls charged on passenger cars and light commercial vehicles at six barrier toll plazas located in rural areas of the I-81 Corridor could provide approximately \$3 billion of additional capital funds during the 15-year project implementation period.

Finally, no local financial resources are built into our plan of finance, although STAR Solutions does anticipate the opportunity to work with local governments to identify potential resources such as tax increments, recordation taxes and right-of-way donations that could contribute to funding of the project and be used to meet any or all of the four above potential objectives. In addition, STAR Solutions is prepared to consult with the MPOs for Bristol, Blacksburg/Christiansburg, Harrisonburg/Staunton, Winchester and Roanoke on the placement and amount of tolls relating to the Project, as required by the USDOT Pilot Program to Toll Interstates.

#### **STAR Solutions' Commitments to I-81**

STAR Solutions' plan of finance combines the benefits of substantial direct investment in the I-81 project with the assurance of the lowest overall cost of project capital. By minimizing the cost of capital the Commonwealth will be assured that toll rates are established and maintained at the minimum level required to develop, finance and operate the project and that the maximum amount of capital funding is generated from the projected net toll revenues.

The STAR Solutions team will provide the following commitments to the project:

- **“At-risk” funding of the consortium’s pre-development costs** until execution of the Comprehensive Agreement. STAR Solutions continues to expend millions to develop the I-81 Project.
- **Firm project cost and schedule guarantees** that will help secure low-cost tax-exempt financing.
- KPRI proposes to provide a **20-year pavement warranty** on each completed Phase of the project, the cost of which we have included in the estimated project costs. This warranty should be viewed as a significant contribution of equity to the project, as it is anticipated that the warranty will reduce future pavement maintenance expenses that would be incurred by VDOT absent the warranty. For example, VDOT paid \$10 million for the warranty on Route 288 but estimated the cost to provide its own maintenance over the 20-year life of the project would be \$17-\$18 million. The value to VDOT of the I-81 pavement warranty is substantial. This warranty should be seen as a contribution of equity by the STAR Solutions team



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because of the risks shifted from VDOT to the private sector and the cost saving, which accrue to VDOT that can be spent on other projects statewide. Such a reduction in life-cycle costs is achieved through the PPTA framework. Further, since the total amount of the warranty is carried as a liability on the KPRI balance sheet, thus tying up those funds and eliminating their use for other corporate initiatives, it is nearly identical to making a direct capital commitment to this project.

## Proprietary & Confidential Information

- Finally, we believe the efforts we have made to date to advance the concepts of **tolls to provide the primary funding for this project, tolling heavy commercial vehicles using dedicated truck lanes and allocation of federal earmarks for dedicated truck lanes** are themselves significant contributions to this project. Prior to the public debate we initiated regarding these concepts, VDOT had concluded that there was insufficient funding to complete even its own improvements plan. The toll revenue represents new money coming into the transportation system to deliver needed improvements and to allow VDOT's scarce transportation dollars to be spent elsewhere in Virginia.

In addition to the above commitments, STAR Solutions explored a funded equity position in the project. However, as the Department is aware, important highway infrastructure projects in the U.S. are able to secure uniquely low-cost funding through a combination of the tax-exempt bond markets and the federal government (through the TIFIA program). Together these capital sources will allow **non-recourse** leveraging of the toll revenue stream at an aggregate debt service coverage that is much more aggressive than available for private sector (non-governmental) projects. For example, our plan of finance uses a minimum 1.15x projected coverage of aggregate debt service on the Bonds and TIFIA Loans. Such a low coverage factor (representing a relatively aggressive high leverage of the projected revenue) would be unattainable for private sector projects that are funded in part by equity. In other words, any funded equity position made by the STAR Solutions team in the project would have to be paid back through project revenues at a higher capital cost than we can achieve by using our proposed financing plan to generate the same amount of funds.

Combining tax-exempt Toll Revenue Bonds with the subordinate TIFIA Loans not only assures the lowest cost of capital, but also assures the greatest degree of operating flexibility for the project. In exploring all funding options, we concluded that any other capital source, including the issuance of deeply subordinated debt and/or equity, would become either extremely expensive and/or very restrictive. With regard to funded equity, current tax law would prohibit an equity investment that participates solely in net profits derived from a project funded with "governmental purpose" tax-exempt bonds. Furthermore, an equity investment would certainly require a rate of return that is far greater than the 5.70 percent–6.45 percent interest rates assumed for the various tranches of the subordinate TIFIA Loans.



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An equity participant would also probably require additional covenants and agreements which would further complicate the process. For these reasons, we chose to forgo the equity option.

With regard to deeply subordinated debt (i.e., debt that is paid after TIFIA debt service), we note that: (1) debt issued based on projected aggregate coverage of less than the 1.15x would be perceived as “quasi-equity” and would require equity-like returns; and (2) any potential investors in bottom-tier subordinate debt (below TIFIA) would likely require more restrictive financing covenants than the federal government does on the TIFIA program. For example, TIFIA allows the deferral of interest payments for up to five years after project completion. Subordinate debt holders are not likely to offer the same type of flexible repayment terms.

Therefore, because one of our primary objectives is to secure the lowest all-in borrowing costs for the project (and to thereby require the lowest toll structure to repay the debt, the least amount of contribution from the Commonwealth, and the maximum funding capacity from projected toll revenues), we have concluded that our capital structure is the most favorable for the I-81 project. However, we will continue to explore all funding possibilities throughout the pre-development Phase of the project.

#### **Ongoing Public Sector Contributions**

VDOT Responsibility for Asset Management and Public Safety Costs. STAR Solutions proposes that VDOT continue to be responsible for all costs of patrolling, public safety, and maintenance and repair of I-81 (exclusive of the latter costs covered by the proposed KPRI pavement warranty or funded by the proposed toll facilities replacement reserve). The credit quality of the Toll Revenue Bonds and the TIFIA Loans, as proposed, will depend on VDOT’s continued acceptance of this responsibility. The pro forma analysis included in this Detailed Proposal reflects the availability, after the completion of the project in 2018, of excess toll revenues (after funding toll collection costs, Bond debt service, TIFIA Loan repayments, toll facilities replacement reserve and any other reserves as needed to satisfy market requirements) to reimburse VDOT for such costs.

Local Government Contributions. No local government contributions or financial support are assumed in our Detailed Proposal.

#### **Schedule of Project Revenues and Ongoing Project Operating and Maintenance Costs**

Please see Tab Q for a discussion of the projected cash flows and Tab S for a discussion of projected toll revenues and toll collection and administrative costs and toll facilities replacement reserve deposits.

## Tab Q Preliminary Finance Plan

***A preliminary plan of finance for the project that includes all items required at the conceptual stage. Include in the finance plan all work necessary for the completion of the project, including assumptions where VDOT is responsible for the work and or the funding. Provide pro forma schedules detailing the preliminary plan of finance including debt amortization, project draw schedule, deposits to fund reserve accounts and anticipated cash flows.***

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### **Purpose and Objectives of Preliminary Plan of Finance**

STAR Solutions has developed a preliminary plan of finance for the project that maximizes project funding from toll resources and, in conjunction with other anticipated resources, provides funding of all of the estimated project costs discussed in Tab O and allows I-81 users and the Commonwealth to realize the full benefits of the I-81 improvements within 15 years. Based on previous and current VDOT six-year plans and traditional construction and funding mechanisms, the proposed level of improvements could never be achieved. Our plan recognizes the need for long-term solutions to the problems on I-81, not just interim improvements that will be obsolete as soon as they are completed. In addition, our plan for financing the improvements will be cost-effective by using a mixture of funding sources.

STAR Solutions will work with the Commonwealth and the Department to ensure that the financing plan for the project is fully consistent with Governor Warner's proposals to implement VDOT financial reforms and require additional accountability. This will include the adoption of a detailed funding plan, assistance with the development of quarterly reports to the public and General Assembly, and work with local governments to ensure consistency with local land use, economic development, and transportation planning. Initial costs of planning and design work and investment grade toll feasibility studies for the project will begin to be funded after VDOT and STAR Solutions have negotiated a Comprehensive Agreement.

We propose that the annual costs of toll collection and administration will be paid from project toll revenues. To maximize the leveraging capacity of the toll revenue stream, STAR Solutions proposes that VDOT continue to be fully responsible for (a) all maintenance services during the construction of each Phase; (b) all highway patrol and public safety functions; and (c) maintenance and repair of the improved I-81 highway and bridge assets, other than (i) repair and replacement of pavement covered by the proposed KPRI pavement warranty (which begins when each Phase is completed) and (ii) replacement of toll collection facilities. This is the same responsibility that VDOT would have for any other roadway that is part of the Commonwealth's highway system. However, unlike other VDOT maintained roadways, after the four Phases of I-81 project improvements are completed, STAR Solutions proposes that VDOT be reimbursed, on a subordinate basis, for these costs from available net toll revenues.

Following is a discussion of the seven principal elements of our preliminary plan of finance.

- Development Plan
- Anticipated Financing Schedule
- Operating Plan
- Financing Costs
- Preliminary Flow of Funds



***A preliminary plan of finance for the project that includes all items required at the conceptual stage. Include in the finance plan all work necessary for the completion of the project, including assumptions where VDOT is responsible for the work and or the funding. Provide pro forma schedules detailing the preliminary plan of finance including debt amortization, project draw schedule, deposits to fund reserve accounts and anticipated cash flows.***

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- Estimated Sources and Uses of Funds During Project Implementation Period
- Pro Forma Projected Operations

#### **Development Plan**

We expect that the **Comprehensive Agreement** will include a **Financing Plan** that outlines the expected financial resources that STAR Solutions and VDOT will provide during the multi-year project implementation period. In addition, the Comprehensive Agreement will specify STAR Solutions' and VDOT's mutual obligations regarding funding and execution of toll collection, maintenance and repair of the completed improvements. The terms of the Comprehensive Agreement will provide the basis for advancing the plan of finance with third-party lenders, including the federal government under USDOT's TIFIA program.

Prior to closing the initial series of Toll Revenue Bonds and TIFIA Loans, STAR Solutions will partner with VDOT and USDOT to accomplish the following tasks:

- Receive final pilot program designation from the Federal Highway Administration to allow tolls to be collected on existing interstate highways when the tolls will be used to fund reconstruction of that highway as established by Section 1216(b) of TEA-21. VDOT has previously applied to, and received conditional provisional approval from, FHWA for such a designation for the I-81 project
- Obtain federal earmarks as well as pursue funding from the Intelligent Transportation Systems program, the National Corridor Planning and Development Program, the Coordinated Border Infrastructure Program, homeland security appropriations for emergency preparedness/evacuation readiness, or other federal programs that may be created during the development period
- Negotiate the Comprehensive Agreement, including a Design/Build Contract and Toll Collection Operating Agreement
- Coordinate Virginia Transportation Development Plan I-81 improvements with the improvements to be implemented by STAR Solutions
- Perform ongoing geotechnical work and surveys
- Develop necessary environmental studies and reports
- Obtain FHWA Record of Decision for the overall project and required permits and approvals for at least the initial Phase of the project
- Acquire any necessary right-of-way for at least the initial Phase of the project
- Develop an independent investment-grade feasibility report, including "peer review", on projected toll traffic and net toll revenues
- Develop an independent investment-grade consulting engineer's review of the proposed scope, cost and schedule of the project improvements



***A preliminary plan of finance for the project that includes all items required at the conceptual stage. Include in the finance plan all work necessary for the completion of the project, including assumptions where VDOT is responsible for the work and or the funding. Provide pro forma schedules detailing the preliminary plan of finance including debt amortization, project draw schedule, deposits to fund reserve accounts and anticipated cash flows.***

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Pending the receipt of proceeds from the first series of Toll Revenue Bonds and the first tranche of TIFIA Loans, the proposed sources of funding for the above tasks are federal earmarks and CTB allocations.

In addition, STAR Solutions will take the lead in the following financing-related tasks, which are included on the project development schedule in Tab L.

- Receive a rating agency's preliminary opinion letter that Senior Toll Revenue Bonds will be investment grade
- File an overall project application with TIFIA that includes this rating agency letter
- Negotiate a preliminary term sheet with TIFIA, in conjunction with VDOT
- Execute a TIFIA Secured Loan Agreement
- Receive underlying credit ratings on Bonds and any construction financing secured by the TIFIA Secured Loan Agreement
- Arrange any credit enhancement on Bonds
- Distribute the preliminary offering document
- Educate potential bond purchasers about the new I-81 toll credit through both an Internet "roadshow" as well as group and one-on-one meetings and conference calls with institutional investors
- Price the debt issues and close the financings, which along with other committed resources, will be sufficient to fund the completion of Phase 1 as well as all costs expected to be incurred on the remainder of the I-81 Corridor through the opening of the Phase 1 dedicated truck lanes

The costs of these steps will be borne by members of STAR Solutions and be reimbursed from the initial series of financing proceeds.

#### **Anticipated Financing Schedule**

STAR Solutions proposes to implement the I-81 project in four Phases. The project schedule included in Tab L details the construction period for the four Phases, each of which will include environmental permitting, engineering, right-of-way acquisition, utilities, and other construction work. While the plan of finance is further developed after signing the Comprehensive Agreement, STAR Solutions proposes that such costs will be funded from CTB allocations and federal earmarks.

The first toll financing is anticipated to be closed in 2005 after the following principal steps have been achieved:

- Receipt of a FHWA Record of Decision
- Negotiation of a design/build contract and an operating agreement relating to the project
- Receipt of investment grade ratings and, if economically beneficial, credit enhancement on the Toll Revenue Bonds
- Finalization of the first tranche of the TIFIA Secured Loan Agreement



***A preliminary plan of finance for the project that includes all items required at the conceptual stage. Include in the finance plan all work necessary for the completion of the project, including assumptions where VDOT is responsible for the work and or the funding. Provide pro forma schedules detailing the preliminary plan of finance including debt amortization, project draw schedule, deposits to fund reserve accounts and anticipated cash flows.***

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Long-term financing to fund the completion of each subsequent Phase will be accomplished after each appropriate step has been updated. The preliminary plan of finance reflects closing each series of long-term financing in 2005, 2010, 2012 and 2015.

Each series of Toll Revenue Bonds and each tranche of BANs/TIFIA Loans are sized based on net toll revenues that are forecast to be collected from (a) the Interim Toll and (b) the Completed Toll on any Phase that has already been completed or will be completed using the proceeds of the Bonds and BANs as well as other committed resources.

STAR Solutions' investment bankers, Citigroup, Lehman Brothers and Morgan Keegan (the "Banking Team") expect that the plan of finance as set forth in this proposal can and will be executed on behalf of STAR Solutions and the Department, assuming that the minimum required ratings are obtained for the various components of the plan of finance and that other basic capital markets requirements are met. The Banking Firms expect that ratings requirements and other minimum requirements can and will be met and will be aggressive in working toward implementing the proposed plan of finance. The Banking Firms expect to refine the financing plan over the course of project negotiations and development of the Comprehensive Agreement and other financing documents.

It should be understood that this proposal shall not constitute or give rise to any obligation to provide or commit to provide any financing, including financing for the project; such an obligation would arise only under separate written agreements, which would include standard conditions precedent, acceptable to the Banking Firms in each firm's sole discretion.

### **Operating Plan**

STAR Solutions' Operating Plan for the project includes three principal components:

- Toll collection managed by an unaffiliated private company or STAR Solutions itself.
- Administrative functions (accounting, legal, contract oversight, etc.) managed by STAR Solutions and/or the 63-20 special purpose entity established as the financing entity.
- Costs of Asset Management of all I-81 assets, except pavement covered by the KPRI warranty and toll collection facilities, to be the responsibility of VDOT.

Toll Collection. Tolls will be collected from all Heavy Commercial Vehicles. We anticipate that design, installation, testing and operation of an open-road, latest-technology, 100 percent ETC system will be contracted to a private company under a long-term management contract. The assumptions for the configuration of the toll collection system are described in Tab S.

STAR Solutions will partner with VDOT to ensure that the ETC system is compatible with the existing Smart Tag system used elsewhere in Virginia and with systems in nearby states to ensure that effective toll collection and enforcement mechanisms are available. In addition, STAR Solutions will cooperate with VDOT's ETC marketing and customer service initiatives and coordinate our activities with VDOT and its consultants. It should be noted that during our various meetings with stakeholder groups, particularly the trucking community, they have requested that such a system be compatible with the E-ZPass system used in West Virginia, Maryland and states further north. Therefore, STAR Solutions proposes to work with VDOT,



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other non-VDOT toll facilities and E-ZPass authorities to refine how best to proceed with the implementation of an E-ZPass compatible ETC system for I-81. For example, STAR Solutions has assumed that VDOT, in conjunction with other Smart Tag toll authorities, would decide how best to fund E-ZPass membership as well as implement and operate an E-ZPass compatible Service Center.

Administration. STAR Solutions will be responsible for administrative functions associated with the toll collection and financing operations, including accounting, legal, contract oversight and bond trustee requirements. We have assumed that the State will continue to be responsible for providing normal public safety and highway patrol functions, which will be facilitated by the ITS capital improvements included in our project.

Asset Management. STAR Solutions proposes that VDOT be financially responsible for Asset Management of the tolled and any non-tolled roadway and ramps, other than pavement covered by the KPRI pavement warranty and toll collection facilities, as well as all structures and other I-81 assets. As an option, STAR Solutions proposes, after the completion of each Phase of the project, to provide fence-to-fence Asset Management of both existing facilities as well as the new improvements relating to that Phase. VDOT's Asset Management costs will be reduced during the life of the project because of the proposed KPRI pavement warranty and the possibility of STAR Solutions providing fence-to-fence Asset Management.

### **Financing Costs**

Following is a summary of the assumed terms of each debt instrument that we have included in our plan of finance:

- Toll Revenue Bonds
- Bond Anticipation Notes
- TIFIA Loans
- Cash Flow Notes

Toll Revenue Bonds. We assume the Bonds will have a 40-year final maturity and a forecasted minimum debt service coverage level of 150 percent. Assuming the preliminary toll revenue forecasts are confirmed in an investment grade traffic and revenue report, the Banking Team feels that this coverage level is sufficient to obtain one or more investment grade credit ratings. We also expect that bond insurance would be available for Bonds to obtain "AAA" ratings.

Four series of Toll Revenue Bonds are assumed to be issued in 2005, 2010, 2012 and 2015 with the same terms and structure. Exhibit 2 in Tab T summarizes the use of proceeds and net annual debt service for each series of Bonds.



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Par Amount:	Each Series of Bonds is sized based on forecast toll revenues, net of toll collection costs, from all Phases that are in operation after expenditure of the proceeds of that Series of Bonds and the related series of BANs/tranche of the TIFIA Loan
Ratings:	“AAA” insured
Maximum Maturity:	40 years from issuance
Amortization:	Interest-only for 5 years; thereafter, ascending annual debt service with minimum 150 percent annual debt service coverage from projected net revenues
Bond Interest Rate:	Fixed-rate current interest bonds and capital appreciation bonds (which have a 50 basis point premium over current interest bonds). Rates on the 2005 issue reflect market conditions on August 20, 2003 plus 25 basis points market cushion. Rates on three subsequent issues (2010, 2012 and 2015) are increased further by 25, 50 and 75 basis points, respectively
Credit Enhancement:	AAA-insured with insurance premium of 1.00 percent of total scheduled principal and interest
Capitalized Interest:	Net funded from delivery through the expected completion date of each Phase
Debt Service Reserve:	Lesser of maximum annual debt service, 125 percent average annual debt service or 10 percent of initial par; funded from Bond proceeds. To optimize the efficiency of the financing plan for any given series of Bonds, we would also evaluate whether it would be more cost-effective to satisfy the Reserve Requirement with a surety policy rather than Bond proceeds
Bond Issuance Costs:	2.0 percent of par amount
Reinvestment Rates:	
Cash Balance	2.00 percent
Capitalized Interest	2.75 percent
DSRF	4.00 percent



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Bond Anticipation Notes. Four series of BANs are assumed to be issued in 2005, 2010, 2012 and 2015 with the same terms and structure. Exhibit 3 in Tab T summarizes the uses of proceeds for each series of BANs.

Par Amount:	Each Series of BANs is sized so that the take-out tranche of the TIFIA Loan can be amortized within the 115 percent aggregate debt service coverage target, based on projected net revenues from the Completed Toll on any Phase of the project that has already been completed or will be completed after the expenditure of the Bond and BAN proceeds
Ratings:	“AA”
Maximum Maturity:	One year after the projected completion of the funded Phase of the project
Amortization:	None. Interest only through maturity
Bond Interest Rate:	Fixed-rate current interest note. Rate on 2005 issue reflects market conditions on August 20, 2003 plus 25 basis points market cushion. Rates on three subsequent issues (2010, 2012, 2015) are increased further by 25, 50 and 75 basis points, respectively
Credit Enhancement:	None
Capitalized Interest:	Net funded from delivery through maturity
Debt Service Reserve:	None
BAN Issuance Costs:	1.0 percent of par amount
Additional Costs:	0.75 percent of par amount for costs relating to the negotiation of each related tranche of the TIFIA Loan
Reinvestment Rates:	
Cash Balance	2.00 percent
Capitalized Interest	2.75 percent
DSRF	Not applicable



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TIFIA Loan. Four tranches of the TIFIA Loan are committed to in 2005, 2010, 2012 and 2015 with the same terms and structure. Draws on each tranche of the TIFIA Loan occur at the maturity of the associated BAN issue. Exhibit 4 in Tab T summarizes the drawdown and annual repayments for each tranche of the TIFIA Loan.

Par Amount:	Each tranche of the TIFIA Loan is sized based on 115 percent coverage of aggregate outstanding Bond debt service and TIFIA Loan repayments, from projected toll revenues, net of toll collection costs, from all Phases that are completed and in operation after funding by each respective of series of Bonds and BANs/TIFIA Loan (not more than 33 percent of eligible costs)
Maximum Maturity:	35 years after the expected completion date of each Phase
Amortization:	Beginning five years after the expected completion date of each Phase; ascending annual repayments with minimum 115 percent annual aggregate coverage from projected net revenues
Loan Interest Rate:	Fixed rate. Rate on 2005 Loan is equivalent U.S. Treasury yield on August 20, 2003 plus 5 basis points servicing cost plus 25 basis points market cushion. Rates on three subsequent tranches of the TIFIA Loan (2010, 2012 and 2015) are increased further by 25, 50 and 75 basis points, respectively
Credit Enhancement:	None
Capitalized Interest:	Accrued interest is deferred and added to Loan balance until five years after the expected completion date of each Phase
Debt Service Reserve:	None
Transaction Costs:	None when each tranche of the TIFIA Loan is drawn. Costs relating to negotiation of each tranche of the TIFIA Loan are funded from proceeds of related BANs
Reinvestment Rates:	Not applicable

Cash Flow Notes. In certain years during the 15-year project implementation period, projected cash balances provide limited levels of working capital. Our plan of finance includes temporary short-term borrowing in the public credit markets to bridge such projected working capital needs in advance of the next series of long-term financing. We have assumed in the pro forma sources and uses forecast that such cash flow borrowing carries a 3.0 percent interest rate and has 1.0 percent issuance costs. Interest on the Cash Flow Notes is paid from toll revenues.



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#### **Preliminary Flow of Funds**

STAR Solutions anticipates that the following flow of funds will be utilized for the financing of the I-81 project, although the final structure is subject to change as the plan of finance is further refined.

- Recurring annual toll collection costs and 63-20 administration costs
- Toll Revenue Bond debt service
- Replenishment of Toll Revenue Bond debt service reserves
- Repayment requirements on TIFIA Loans
- Incentive payments to contractors for early completion
- Deposit to toll facilities replacement reserve
- Deposit to other required reserves for the Bonds and TIFIA Loans
- Deposit to VDOT Reimbursement Fund, out of which VDOT is reimbursed for Asset Management costs and potentially for capital contributions for the I-81 project
- Deposit of all remaining revenues to Corridor Improvement Fund

#### **Estimated Sources and Uses of Funds During Project Implementation Period**

Based on the above assumptions and the project schedule and cost identified in Tabs L and O, the preliminary financing plan is fully funded and does not have any funding shortfalls. The estimated sources and uses of funds during 2004-2018 are detailed in Exhibit 1 in Tab T.

#### **Pro Forma Projected Operations**

Based on the assumptions discussed above and summarized in Exhibit 5 in Tab T, STAR Solutions has prepared an aggregate pro forma annual projections of operations, Bond debt service, TIFIA Loan repayments, debt service coverage, toll facilities replacement reserve deposits and excess revenues during 2004-2054 (see Exhibit 6 in Tab T). In addition, we have prepared pro forma projections as they would appear when each series of financing is closed in 2005, 2010, 2012 and 2015. These projections are attached as Exhibits 7-10 in Tab T. The preliminary financing plan reflects positive annual fund balances at the end of each of 2004 through 2018 and the targeted minimum annual coverages of Bond and aggregate debt service.

Additional resources could potentially be obtained if toll financings are also secured by net toll revenues charged other vehicles, i.e., Passenger Cars and Light Commercial Vehicles. Such vehicles could be tolled at six toll barriers located in non-urban areas through the I-81 corridor, thereby charging long-distance I-81 users for a portion of the improvements that have increased the safety and reliability of travel on I-81, without charging local and commuter traffic. For example, the first toll plaza could be at approximately milepost 60, thus facilitating car traffic in the Bristol-Marion area on a toll-free basis. Based on a preliminary analysis of non-Heavy Commercial Vehicle traffic along I-81, the toll rate on such vehicles would be substantially lower than that for Heavy Commercial Vehicles and would be comparable to current toll rates for passenger cars and light commercial vehicles on existing long-distance eastern tollroads.



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Such additional toll revenue potentially could also be available to reduce the amount of the per mile Heavy Commercial Vehicle toll. Current Virginia law would have to be changed to permit this tolling option. Tolling all vehicles would, of course, incur additional toll operating and maintenance costs and revisions to this Detailed Proposal to facilitate the construction of toll plazas.

STAR Solutions' preliminary analysis of this option assumes a relatively low toll rate schedule is imposed at each barrier when each Phase is completed—the toll rate in 2009 at the toll barrier constructed in Phase 1 is assumed to be approximately \$2.00 for passenger cars and \$4.50 for light commercial vehicles. Approximately \$3 billion of projected additional funding capacity could be generated by this option during the 15-year period. This would be equivalent to approximately 50 percent of the toll-based funding capacity from Heavy Commercial Vehicles that is reflected in this Detailed Proposal. The Commonwealth and other stakeholders could evaluate how such funding capacity would be utilized.

STAR Solutions recognizes that many elements of our preliminary plan of finance will need to be adjusted and refined as the project is developed in partnership with VDOT. The timing of both sources and uses of funds can be expected to be modified during the multi-year implementation period for the project. However, STAR Solutions is confident that, over the course of development of the I-81 Project, we and VDOT can jointly refine a financing plan that best meets all parties' objectives for the Project, including truck users, other vehicle users, VDOT, the FHWA, Virginia and Congressional legislative delegations, and other interested parties.



## Tab R Preliminary Rail Finance Plan

***A preliminary plan of finance that addresses the rail option(s). Include pro forma schedules detailing the preliminary plan of finance, including debt amortization, project draw schedule, deposits to fund reserve accounts and anticipated cash flows.***

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STAR Solutions anticipates that the Phase 1 rail project will be funded by a direct loan from the existing Federal Railroad Administration's Railroad Rehabilitation and Improvement Financing (RRIF) program. RRIF financial assistance can be used to improve or rehabilitate rail freight facilities, including tracks and bridges that enhance public safety and the environment, which are two of the primary goals of STAR Solutions' proposed I-81 project.

STAR Solutions is prepared to negotiate and enter into an agreement with Norfolk Southern (NS) to satisfy repayment requirements for a RRIF loan or any subsequent federal credit assistance programs for private freight facilities. For example, the Bush Administration has proposed, in its SAFETEA surface transportation reauthorization bill, that private freight facilities could receive credit assistance from the existing TIFIA program. However, such TIFIA credit assistance would only be provided if senior market debt or the TIFIA lien itself is investment grade. Such credit quality could only be achieved, we believe, if NS were to provide a minimum throughput guarantee that is backed by its general credit. To date, NS has not proffered such balance sheet support for this rail project.

Our preliminary finance plan reflects the FRA Regulations revised as of October 1, 2000, for the RRIF loan and loan guarantee program. The assumed RRIF Loan has a 25-year final maturity from its date of execution and an assumed fixed interest rate of 5.45 percent, which equals the yield on equivalent-term US Treasury securities as of August 5, 2003, plus 25 basis points "market cushion" for the assumed 2005 origination date. The sole security for loan repayment is assumed to be NS's payment of a fee for each trailer or box that actually uses the improved track section. The traffic and toll revenue study for I-81 improvements will include analysis of the projected amount of throughput that will generate such NS fee payments. (RRIF regulations encourage use of third-party consultants approved by FRA.) This consultant study should be part of the application for the RRIF Loan, along with other material provided by NS, such as a statement of its maintenance program and evidence that private sector financing is not available for the project as proposed to RRIF. We would expect to size the per box throughput fee so that projected NS payments provide at least 1.30 times coverage of scheduled annual repayments. We would expect that FRA and NS will negotiate the use of revenues that exceed scheduled annual repayments, i.e., whether such coverage revenues are used to pre-pay the RRIF Loan or are returned to NS.



***A preliminary plan of finance that addresses the rail option(s). Include pro forma schedules detailing the preliminary plan of finance, including debt amortization, project draw schedule, deposits to fund reserve accounts and anticipated cash flows.***

We have assumed that the RRIF Loan will be drawn annually to fund Phase 1 rail project cost requirements during the subsequent 12 months. The assumed construction period totals 42 months. Pending monthly project cost disbursements, Loan draws are assumed to earn at one percent. The Loan is assumed to accrue and compound interest semi-annually until the completion of construction; these accrued amounts are built into the Loan par amount. Due to the relatively low credit quality of the repayment stream, we believe that FRA would require (and fund with RRIF Loan proceeds) a \$10 million reserve fund that could be drawn upon if box payments were ever insufficient to fund scheduled principal and interest payments on the Loan. Assumed Loan origination costs total \$3 million. In addition, NS should expect that it will need to pay FRA both an "investigation charge," which can total up to 0.5 percent of the face amount of the RRIF Loan, and a "credit risk premium" that is based on FRA's evaluation of the default risk on the RRIF Loan (assumed for preliminary financing plan purposes to equal 2.5 percent of the Loan's par amount). These costs cannot be funded from the RRIF Loan and are assumed to be funded as a NS equity contribution to the project.

The following table summarizes the estimated sources and uses of funds for the rail project (\$ in millions):

<b><u>Estimated Sources</u></b>	
Par amount of RRIF Loan	\$138.5
Investment earnings on Loan draws pending disbursement on project costs	0.5
Norfolk Southern equity contribution	4.2
<b>Total Estimated Sources</b>	<b>\$143.2</b>
<b><u>Estimated Uses</u></b>	
Rail project costs	\$111.0
Accrued and unpaid interest during construction	15.0
Reserve fund	10.0
Loan origination costs	3.0
FRA investigation charge	0.7
FRA credit risk premium	3.5
<b>Total Estimated Uses</b>	<b>\$143.2</b>



***A preliminary plan of finance that addresses the rail option(s). Include pro forma schedules detailing the preliminary plan of finance, including debt amortization, project draw schedule, deposits to fund reserve accounts and anticipated cash flows.***

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Based on the above assumptions, the scheduled annual RRIF Loan repayments during a 21-year amortization period equal \$11.236 million. Based on box throughput of 560,000 units, the net charge per box would be \$20.06, which would remain constant over the term of the RRIF Loan. Figures R-1 through R-4 detail the drawdown, sizing and amortization of the RRIF Loan are attached.

STAR Solutions will also work with VDOT to utilize funds allocated for improvements to the NS Route 29 crossing at Gainesville in Prince William County. We will also work with DRPT to effectively utilize Highway Rail Crossing (Section 130) funds scheduled for improvements to the highway crossings in Prince William, Fauquier and Warren Counties.

**STAR Solutions Detailed Proposal** **FIGURE R-1**  
**RRIF Loan for Rail Project**

*Estimated Sources and Uses of Funds*

<u>Sources</u>	
Par Amount of RRIF Loan	138,505,000.00
Investment Earnings on Loan Draws Pending Disbursement of Project Costs	547,345.71
Norfolk Southern Equity Contribution	4,155,150.00
<b>Total</b>	<b>143,207,495.71</b>
<u>Uses:</u>	
Rail Project Costs	111,000,000.00
Accrued and Unpaid Interest During Construction	15,048,645.18
Deposit to Debt Service Reserve Fund	10,000,000.00
Loan Origination Costs	3,000,000.00
Loan Rounding Amount	3,700.53
FRA Investigation Charge	692,525.00
FRA Credit Risk Premium	3,462,625.00
<b>Total</b>	<b>143,207,495.71</b>

STAR Solutions Detailed Proposal  
RRIF Loan for Rail Project

FIGURE R-2

Construction Fund

Date	Days (30/360)	Beginning Balance(1)	Loan Draws	Interest Earnings(1) 1.000000%	Project Cost Draws	Other Draws	1.000% PV from Loan Draw Date	Total Loan Draws	Ending Balance
1/1/05			16,653,203.03	-		3,000,000.00	3,000,000.00	123,452,654.29	13,653,203.03
2/1/05	30	13,653,203.03		11,354.04			-		13,664,557.06
3/1/05	30	13,664,557.06		11,363.48			-		13,675,920.54
4/1/05	30	13,675,920.54		11,372.93			-		13,687,293.47
5/1/05	30	13,687,293.47		11,382.39			-		13,698,675.86
6/1/05	30	13,698,675.86		11,391.85			-		13,710,067.71
7/1/05	30	13,710,067.71		11,401.33	2,291,666.67		2,280,265.34		11,429,802.37
8/1/05	30	11,429,802.37		9,505.05	2,291,666.67		2,278,370.64		9,147,640.76
9/1/05	30	9,147,640.76		7,607.20	2,291,666.67		2,276,477.52		6,863,581.29
10/1/05	30	6,863,581.29		5,707.77	2,291,666.67		2,274,585.97		4,577,622.40
11/1/05	30	4,577,622.40		3,806.76	2,291,666.67		2,272,695.99		2,289,762.49
12/1/05	30	2,289,762.49		1,904.17	2,291,666.67		2,270,807.58		0.00
1/1/06	30	0.00	27,374,672.07	0.00	2,291,666.67		2,291,666.67		25,083,005.40
2/1/06	30	25,083,005.40		20,859.09	2,291,666.67		2,289,762.49		22,812,197.82
3/1/06	30	22,812,197.82		18,970.68	2,291,666.67		2,287,859.90		20,539,501.84
4/1/06	30	20,539,501.84		17,080.70	2,291,666.67		2,285,958.90		18,264,915.87
5/1/06	30	18,264,915.87		15,189.15	2,291,666.67		2,284,059.47		15,988,438.36
6/1/06	30	15,988,438.36		13,296.03	2,291,666.67		2,282,161.61		13,710,067.71
7/1/06	30	13,710,067.71		11,401.33	2,291,666.67		2,280,265.34		11,429,802.37
8/1/06	30	11,429,802.37		9,505.05	2,291,666.67		2,278,370.64		9,147,640.76
9/1/06	30	9,147,640.76		7,607.20	2,291,666.67		2,276,477.52		6,863,581.29
10/1/06	30	6,863,581.29		5,707.77	2,291,666.67		2,274,585.97		4,577,622.40
11/1/06	30	4,577,622.40		3,806.76	2,291,666.67		2,272,695.99		2,289,762.49
12/1/06	30	2,289,762.49		1,904.17	2,291,666.67		2,270,807.58		0.00
1/1/07	30	0.00	41,524,355.20	0.00	2,291,666.67		2,291,666.67		39,232,688.54
2/1/07	30	39,232,688.54		32,626.00	2,291,666.67		2,289,762.49		36,973,647.87
3/1/07	30	36,973,647.87		30,747.38	2,291,666.67		2,287,859.90		34,712,728.58
4/1/07	30	34,712,728.58		28,867.19	2,291,666.67		2,285,958.90		32,449,929.11
5/1/07	30	32,449,929.11		26,985.44	2,291,666.67		2,284,059.47		30,185,247.88
6/1/07	30	30,185,247.88		25,102.13	2,291,666.67		2,282,161.61		27,918,683.34
7/1/07	30	27,918,683.34		23,217.25	4,666,666.67		4,643,449.42		23,275,233.93
8/1/07	30	23,275,233.93		19,355.74	4,666,666.67		4,639,591.12		18,627,923.00
9/1/07	30	18,627,923.00		15,491.03	4,666,666.67		4,635,736.03		13,976,747.36
10/1/07	30	13,976,747.36		11,623.10	4,666,666.67		4,631,884.15		9,321,703.79
11/1/07	30	9,321,703.79		7,751.95	4,666,666.67		4,628,035.46		4,662,789.08
12/1/07	30	4,662,789.08		3,877.59	4,666,666.67		4,624,189.97		0.00
1/1/08	30	0.00	37,900,424.00	0.00	4,666,666.67		4,666,666.67		33,233,757.33
2/1/08	30	33,233,757.33		27,637.28	4,666,666.67		4,662,789.08		28,594,727.94
3/1/08	30	28,594,727.94		23,779.45	4,666,666.67		4,658,914.71		23,951,840.72
4/1/08	30	23,951,840.72		19,918.41	4,666,666.67		4,655,043.57		19,305,092.47
5/1/08	30	19,305,092.47		16,054.16	4,666,666.67		4,651,175.64		14,654,479.96
6/1/08	30	14,654,479.96		12,186.70	4,666,666.67	10,000,000.00	14,605,834.33		0.00
7/1/08	30	-		-					
8/1/08	30	-		-					
9/1/08	30	-		-					
<b>Total</b>	<b>1,320.00</b>		<b>123,452,654.29</b>	<b>547,345.71</b>	<b>111,000,000.00</b>		<b>123,452,654.29</b>	<b>-</b>	

**STAR Solutions Detailed Proposal** **FIGURE R-3**  
**RRIF Loan for Rail Project**

*Interest Accrued Until End of Construction Period*

Date	Loan Draws	Beginning Par Requirement	Rate	Interest Accrued in Period	Ending Par Requirement
1/1/05	16,653,203.03	16,653,203.03			16,653,203.03
7/1/05		16,653,203.03	5.450%	453,799.78	17,107,002.81
1/1/06	27,374,672.07	44,481,674.87	5.450%	1,212,125.64	45,693,800.51
7/1/06		45,693,800.51	5.450%	1,245,156.06	46,938,956.58
1/1/07	41,524,355.20	88,463,311.78	5.450%	2,410,625.25	90,873,937.03
7/1/07		90,873,937.03	5.450%	2,476,314.78	93,350,251.81
1/1/08	37,900,424.00	131,250,675.81	5.450%	3,576,580.92	134,827,256.73
6/1/08		134,827,256.73	5.450%	3,674,042.75	138,501,299.47
<b>Total</b>	<b>123,452,654.29</b>			<b>15,048,645.18</b>	

**STAR Solutions Detailed Proposal** **FIGURE R-4**  
**RRIF Loan for Rail Project**

*Debt Service Schedule*

Date	Principal	Rate	Interest	Total Debt Service	Annual Debt Service
	-	5.450%		-	
	-	5.450%		-	-
	-	5.450%		-	-
	-	5.450%		-	-
6/1/08				-	-
1/1/09	-	5.450%	4,403,304.79	4,403,304.79	4,403,304.79
7/1/09			3,774,261.25	3,774,261.25	
1/1/10	3,685,000.00	5.450%	3,774,261.25	7,459,261.25	11,233,522.50
7/1/10			3,673,845.00	3,673,845.00	
1/1/11	3,885,000.00	5.450%	3,673,845.00	7,558,845.00	11,232,690.00
7/1/11			3,567,978.75	3,567,978.75	
1/1/12	4,100,000.00	5.450%	3,567,978.75	7,667,978.75	11,235,957.50
7/1/12			3,456,253.75	3,456,253.75	
1/1/13	4,320,000.00	5.450%	3,456,253.75	7,776,253.75	11,232,507.50
7/1/13			3,338,533.75	3,338,533.75	
1/1/14	4,560,000.00	5.450%	3,338,533.75	7,898,533.75	11,237,067.50
7/1/14			3,214,273.75	3,214,273.75	
1/1/15	4,805,000.00	5.450%	3,214,273.75	8,019,273.75	11,233,547.50
7/1/15			3,083,337.50	3,083,337.50	
1/1/16	5,070,000.00	5.450%	3,083,337.50	8,153,337.50	11,236,675.00
7/1/16			2,945,180.00	2,945,180.00	
1/1/17	5,345,000.00	5.450%	2,945,180.00	8,290,180.00	11,235,360.00
7/1/17			2,799,528.75	2,799,528.75	
1/1/18	5,635,000.00	5.450%	2,799,528.75	8,434,528.75	11,234,057.50
7/1/18			2,645,975.00	2,645,975.00	
1/1/19	5,945,000.00	5.450%	2,645,975.00	8,590,975.00	11,236,950.00
7/1/19			2,483,973.75	2,483,973.75	
1/1/20	6,265,000.00	5.450%	2,483,973.75	8,748,973.75	11,232,947.50
7/1/20			2,313,252.50	2,313,252.50	
1/1/21	6,610,000.00	5.450%	2,313,252.50	8,923,252.50	11,236,505.00
7/1/21			2,133,130.00	2,133,130.00	
1/1/22	6,970,000.00	5.450%	2,133,130.00	9,103,130.00	11,236,260.00
7/1/22			1,943,197.50	1,943,197.50	
1/1/23	7,350,000.00	5.450%	1,943,197.50	9,293,197.50	11,236,395.00
7/1/23			1,742,910.00	1,742,910.00	
1/1/24	7,750,000.00	5.450%	1,742,910.00	9,492,910.00	11,235,820.00
7/1/24			1,531,722.50	1,531,722.50	
1/1/25	8,170,000.00	5.450%	1,531,722.50	9,701,722.50	11,233,445.00
7/1/25			1,309,090.00	1,309,090.00	
1/1/26	8,615,000.00	5.450%	1,309,090.00	9,924,090.00	11,233,180.00
7/1/26			1,074,331.25	1,074,331.25	
1/1/27	9,085,000.00	5.450%	1,074,331.25	10,159,331.25	11,233,662.50
7/1/27			826,765.00	826,765.00	
1/1/28	9,580,000.00	5.450%	826,765.00	10,406,765.00	11,233,530.00
7/1/28			565,710.00	565,710.00	
1/1/29	10,105,000.00	5.450%	565,710.00	10,670,710.00	11,236,420.00
7/1/29			290,348.75	290,348.75	
1/1/30	10,655,000.00	5.450%	290,348.75	10,945,348.75	11,235,697.50
<b>Total</b>	<b>138,505,000.00</b>		<b>101,830,502.29</b>	<b>240,335,502.29</b>	<b>240,335,502.29</b>

## Tab S User Fees and Other Revenue Sources

***A detailed discussion of assumptions about user fees or other revenue sources, and usage of the facility such as traffic forecasts and assumptions.***

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STAR Solutions has prepared preliminary estimates of annual traffic, annual toll revenue, annual costs of toll collection and the capital cost of the toll collection system that have been utilized in the financial analysis. These estimates should be considered preliminary and subject to refinement during the course of project development. Following is a discussion of the assumptions for the following elements related to toll operations:

- Toll System Configuration
- Toll Traffic and Revenues
- Toll Collection and Administrative Costs

### **Toll System Configuration**

The I-81 tolling concept includes the deployment of an open-lane, fully automated, electronic system of toll collection on Heavy Commercial Vehicles. This conceptual system will facilitate the flow of traffic by eliminating the bottlenecks traditionally associated with manual toll collection systems. An additional benefit of this tolling concept is the reduction in ongoing manpower and maintenance needs and costs associated with staffing manual toll collection lanes. This concept has proven effective on the Highway 407 Electronic Toll Road (ETR) project in Toronto, Ontario, and on the SR 91 Express Lanes in Orange County, California.

The proposed toll system involves implementation of toll “read-zones” on each entry and exit ramp along I-81 as well in mainline truck lanes at the northern and southern ends of I-81 and selected truck-only rest area and slip ramp locations along the corridor. At full build-out, this assumes 88 interchanges with 4 open-lanes each for a total of 352 ramp lanes, a six express lane mainline plaza (three lanes each direction) at the northern and southern ends and approximately 16 truck-only rest area and/or slip ramp lanes along the corridor. Truck-only lanes will be restricted to Heavy Commercial Vehicles. Vehicle classification and separation will be accomplished through use of state-of-the-art sensors. This “closed” electronic tolling concept prevents any toll-free movements within the entire system and applies to both the Interim Toll during construction of each Phase and the Completed Toll after completion of each Phase.

STAR Solutions believes that it is feasible to design, procure and install this type of ETC system for operations beginning on Phase 1 in 2007 and that the equipment cost of this closed ETC system on all Heavy Commercial Vehicles would be approximately \$77 million in 2003\$ installed on the entire I-81 corridor. Related civil construction and fiber communication system costs are approximately \$27 million, again in 2003\$. The estimated project costs in the pro forma analysis includes these \$104 million of expenditures in 2005 and 2006.

The ETC system consists of open-road lane equipment at all entry/exit ramps (average of four per interchange) plus 12 mainline lanes plus backoffice plaza equipment and systems to support transaction/revenue reconciliation, auditing, reporting, transmission to the Smart Tag central host and violations processing. The conceptual ETC system as proposed assumes that a satellite Customer Service Center (“**CSC**”) would be located nearby the mainline lanes located at the northern and southern extents of I-81 within the Commonwealth.

***A detailed discussion of assumptions about user fees or other revenue sources, and usage of the facility such as traffic forecasts and assumptions.***

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These satellite CSCs would be linked to the Central Smart Tag CSC located in Reston, Virginia. STAR Solutions assumes that the lane equipment would be E-ZPass compatible and that VDOT/Smart Tag joins the Interagency Working Group responsible for E-ZPass prior to the installation of toll equipment along I-81 to achieve E-ZPass reciprocity through the existing Smart Tag Service Center. In addition, the lane equipment includes the use of a Video Enforcement System (“VES”) utilizing dual cameras (front/back) with optical-character recognition (“OCR”) in a backoffice Violations Processing System (“VPS”) that would be utilized in all lanes. A Violations Processing Center (“VPC”) would be established to support processing violations occurring on I-81.

All the system elements are connected over a high-speed fiber optic backbone. The backoffice plaza system would perform many functions, including:

- Prepare statements for traffic and revenue reports on a periodic basis
- Receive ETC transactions from the tolling zone lane controllers and transmit them to the Reston Smart Tag CSC for billing and statement processing
- Send transaction records to the Reston Smart Tag CSC or other reciprocal toll agencies for payment and auditing of those payments
- Produce reports of system operation, lane revenue, operational status and updates, traffic measurement, repair statistics, and parts inventory
- Manage toll collection enforcement activities, including violation notification and fine collection and processing

To accurately assess tolls on only commercial vehicles, an automatic vehicle classification (“AVC”) system will be integrated into the tolling process. At the conceptual level, each tolling location would include two gantries. The first gantry includes the AVC equipment, an overhead scanner device, and a VES camera that is positioned to capture the rear plate of any vehicle that does not contain a valid tag. This equipment is installed over each express lane. The second gantry includes the ETC antenna and a transaction indicator light. Another VES camera is located slightly downstream from the second gantry and is responsible for the capture of the front vehicle license plate of any vehicle that traverses the read zone and does not have a valid tag. A lane controller device, located in each lane, includes software that determines how each vehicle is processed. The AVC system use a different configuration of sensors for high-speed ramps (e.g., interchange to interchange) than for lower speed ramps to maintain appropriate accuracy standards.

### **Toll Traffic and Revenues**

*Toll Transaction and Revenue Methodology.* STAR Solutions prepared preliminary traffic and revenue estimates using VDOT average daily traffic (“ADT”) data extracted from the I-81 Improvement Studies. Two-way ADT volumes along with passenger and commercial vehicle percentages were provided for each mainline segment for years 1996, 2005, 2010, 2015 and 2020. From this data, toll-free commercial vehicle volumes by segment were estimated for the base year, 1996, and future years.

A manual toll diversion analysis was then utilized to develop traffic volume estimates for I-81 operated as a tolled facility. The diversion analysis estimates the number of vehicles that would remain on the highway under tolled conditions. Since no origin/destination-specific data were



***A detailed discussion of assumptions about user fees or other revenue sources, and usage of the facility such as traffic forecasts and assumptions.***

available for use in this analysis, some typical trip origins and destinations were identified. Some of the origin/destination pairs included trips currently being made along the entire stretch of I-81 from the I-77 Interchange to the Washington, D.C. area and points north and from the southeastern states to I-64 corridor towns of Charlottesville and Richmond. Other origin/destination pairs were also selected. For each movement in the corridor, the cost of making the trip on I-81 was compared with the cost of making the trip via an alternative existing highway route. The costs associated with trip making consist of three items: the distance traveled, the time it takes to make the trip, and any toll costs associated with the trip. All costs are expressed in dollars by applying a value of time and a cost per-mile to the travel time and distance, respectively. A percentage of trips are retained on I-81, based on a cost ratio that compares the cost of a tolled trip using I-81 to the cost of a trip using the next best alternate route.

*Toll Rates.* Because of the exploratory nature of this analysis, a computerized traffic modeling approach was not utilized. While several alternate toll rates were assessed, it was not possible to determine if these rates represent the optimum toll. However, rates tested are within a range of rates currently levied on existing toll roads operating in the United States.

The finance plan in this Detailed Proposal is based on the same toll rates (in 2000 dollars) set forth in our Conceptual Proposal. These rates are comparable to toll rates currently charged Heavy Commercial Vehicles by other inter-city toll roads and turnpikes in the U.S., even though those facilities do not include many of the freight-oriented improvements envisioned in the STAR Solutions plan.

Our assumed Heavy Commercial Vehicle toll rates on I-81 are in fact lower than the rates on other existing toll roads in Virginia such as the Chesapeake Expressway, the Dulles Greenway and the Powhite Parkway.

The per-mile rates assumed to be paid by all Heavy Commercial Vehicles on I-81 in various years are as follows, after taking account of assumed 3.0 percent annual rate increases and considering each Phase's estimated construction schedule.

**Table S-1**  
**STAR Solutions I-81 Project**  
**Assumed Per Mile Toll Rates on Heavy Commercial Vehicles (cents per mile)**

<b>Phase</b>	<b>Between Mileposts</b>	<b>2007</b>	<b>2009</b>	<b>2011</b>	<b>2015</b>	<b>2019</b>
<b>1</b>	180-227	12.3	27.4	29.0	32.7	36.8
<b>2</b>	156-252	--	12.6	29.0	32.7	36.8
<b>3</b>	84-302	--	12.6	13.8	32.7	36.8
<b>4</b>	0-323	--	12.6	13.8	15.6	36.8

*Toll Revenue Estimates.* STAR Solutions estimates that by 2021, the third year after all four Phases are complete, 9.4 million toll transactions would be registered. We have assumed that annual traffic growth continues after 2021 at the following average annual rates: 2021-2040, 2.0 percent; 2041-2050, 1.5 percent; and 2051-2060, 1.0 percent. In addition, the financial analysis assumes that toll rates will increase annually with no reduction in traffic. Rate increases are assumed to be 3.0 percent per year from 2003 to 2018 and 2.5 percent per year thereafter.



***A detailed discussion of assumptions about user fees or other revenue sources, and usage of the facility such as traffic forecasts and assumptions.***

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STAR Solutions has forecast annual toll revenues, based on the assumed toll rates and Heavy Commercial Vehicle toll traffic, from both the Interim Toll on Heavy Commercial Vehicles on any Phase while it is under construction and the Completed Toll on Heavy Commercial Vehicles using any completed Phases. Exhibit 11 in Tab T summarizes the projected annual toll revenues from the Interim Toll and Completed Toll on each Phase, prior to adjustment for increased toll rates. The adjusted toll revenues are utilized in the financial analysis included in this Detailed Proposal.

During meetings with a number of stakeholder groups, the STAR Solutions team has learned about interest in exploring various tolling schemes to provide relief to targeted user groups. Some of these include reduced tolls for empty trucks, agricultural exemptions, commuter rates for trucks that use I-81 several times per week, or reduced tolls for local traffic. In addition, there has been some public discussion of Virginia tax credits for in-state trucking firms. The STAR Solutions team does not oppose these efforts and is willing to explore with VDOT their implementation in a way that does not violate any constitutional provisions or undermine the financing plan.

**Toll Collection and Administrative Costs**

The project will benefit from the efficiencies represented by a state-of-the-art 100 percent ETC system on Heavy Commercial Vehicles by eliminating the need for lane attendants and cash handling. The toll collection costs for ETC system operation and maintenance include the labor and overhead affiliated with facility and staff management/administration, transaction and revenue auditing and reporting, accounting/finance, violations processing, control room supervision, field maintenance and customer service. For customer service the concept includes three service center supervisors to staff the satellite service centers that would provide local customer service in close proximity to the northern and southern mainline lanes. Costs also provide for a fleet of vehicles, including field technician/equipment trucks, bucket trucks and other pool vehicles necessary to support management and operations. We used the following assumptions to develop the estimated toll collection costs.

Staffing. Our concept includes full-time staffing for toll facility management, operations, finance, 24 x 7 x 365 field maintenance and systems support. Management staffing covers executive, operations, accounting, and maintenance functional areas, including shift and facility supervision. A field force of mobile technicians is assigned to three-shift coverage every 50 miles. Field supervisors staff a single supervisor shift every 80 miles. Specialty field engineers with expertise in the areas of software, communications and specific hardware components support the field technicians with management and administrative support.

Facilities. Non-field staffing is based in administrative buildings located within close proximity to the mainline lanes at the northern and southern extents of I-81. These buildings are used to support management, accounting/finance, facility operations, supervision and maintenance functions.

STAR Solutions has estimated that the annual costs of toll collection for a 100 percent ETC system of this nature, operating throughout the I-81 corridor, will be \$10.52 million, stated in 2003 dollars. Even though the Interim Toll is only imposed on Phase 1 in 2007, our financing analysis conservatively assumes the staffing and support costs beginning in 2007 are sufficient to support tolling the entire 325-mile I-81 corridor.



***A detailed discussion of assumptions about user fees or other revenue sources, and usage of the facility such as traffic forecasts and assumptions.***

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In the pro forma analysis shown in Exhibit 6 in Tab T, the estimated annual toll collection costs are inflated by 2.5 percent per year. In addition, the pro forma analysis shown in Exhibit 6 in Tab T reflects replacement of toll equipment on a seven-year replacement cycle, after taking account of assumed 2.5 percent annual cost inflation. These projected replacement costs are funded by annual deposits of excess net revenues to a toll facilities replacement reserve.



## Tab T Business Plan

***A business plan which details the risks and contributions proposed to be made by all parties participating in the project, including bondholders, members of the proposer's team, and the Virginia Department of Transportation. Discuss your proposed approach to assignment/assumption of various project risks.***

STAR Solutions' business plan for this PPTA Detailed Proposal allows VDOT and the Commonwealth to benefit from the transfer of risks to appropriate parties that can manage and mitigate those risks. Our phased approach to the project allows design and construction agreements to be negotiated as each phase's scope is fully identified. The following table summarizes the general allocation of risk we propose be made among STAR Solutions, VDOT and lenders.

### Proposed Risk Allocation for I-81 Project

STAR Solutions	VDOT	Lenders
Construction Quantities	Right-of-Way	Amount of Use by Heavy Commercial Vehicles
Construction Cost	Public Safety	Toll Violation Rate
Construction Schedule	Law Enforcement	Level of Toll Rates
Design and Quality of New Assets	Asset Management (Other Than Pavement Under Warranty and Toll Facilities)	Toll Facilities Replacement Costs
Differing Site Conditions	Environmental Approvals	
Project Coordination, Including Utilities	Hazardous Materials	
Insurance		
Permits and Monitoring		
Payment and Performance Bonds		
Toll Collection Costs		
Pavement Quality and Performance		
Amount of Toll-Based Financing		



***A business plan which details the risks and contributions proposed to be made by all parties participating in the project, including bondholders, members of the proposer's team, and the Virginia Department of Transportation. Discuss your proposed approach to assignment/assumption of various project risks.***

Given the projected 15-year implementation schedule for the project, STAR Solutions recognizes that changed conditions outside the control of either STAR Solutions or VDOT impose real risks for the completion and successful operation of the project. We believe that our approach to the development of the project provides both STAR Solutions and VDOT with the flexibility to address issues and risks as they materialize over time. This flexibility is demonstrated in our approach to mitigating the risks we can currently identify.

*Project Development.* STAR Solutions has already expended considerable resources in developing this comprehensive proposal for short-, medium- and long-range improvements to the I-81 Corridor. A project of this magnitude involves significant development risk, which has been evidenced by STAR Solutions' team members and its consultants incurring more than \$7 million of "at-risk" costs and expenses from the onset of our efforts in early 2001 to the September 2003 submission date of this Detailed Proposal. Further, we recognize that future development and negotiation of a Comprehensive Agreement will involve significant additional time and resources, without any guarantee that the project will proceed as proposed. As tangible demonstration of our confidence that our proposal will ultimately be successful, STAR Solutions is prepared to continue to work with the State until successful execution of a Comprehensive Agreement.

*Project Completion.* Without the resources of the State supporting the toll revenue financing for this project, it is critical to a successful financing that sufficient assurances exist that each Phase of the project will be completed. Such completion has three dimensions: costs not exceeding the expected level, the date of completion being met and all funding resources being available. The following addresses the first two of these dimensions.

STAR Solutions intends to provide guaranteed negotiated prices for each Phase of the roadway. STAR Solutions also anticipates that the completion date for each Phase of the project will be guaranteed, subject to, but not limited to, items such as events of force majeure, and scope changes. STAR Solutions anticipates that, subject to requisite corporate approvals, Kellogg Brown & Root, Inc., a wholly owned subsidiary of the Halliburton Company, will provide the necessary completion guarantees. Please see Tab U for further description.

To provide incentives to the various general contractors working on the project, STAR Solutions proposes to include incentives for early completion and liquidated damages for missing the guaranteed completion dates. Early completion incentives would be funded by a portion of the net revenues collected due to earlier than projected operation at the higher Completed Toll rate. Liquidated damages would be the obligation of the completion guarantor.

*Funding Sufficiency.* STAR Solutions' proposed plan of finance includes four separate series of tax-exempt debt issued periodically during the construction program. In addition, phased issuances of BANs/TIFIA Loans are timed to coincide with each series of Bonds. Given the number of years that are projected to elapse between the first and last financings, there is a risk that the needed capital can be raised at the assumed rates. To insulate STAR Solutions, VDOT and existing lenders from this risk, we plan to ensure that each financing is sufficient, along with committed federal and state resources, to complete a specific Phase of the project. Correspondingly, each series of Bonds and each tranche of BANs/TIFIA Loans will be sized based on targeted coverage from the projected net toll revenues collected from (i) the Interim Toll and (ii) the Completed Toll on any Phases that have already been completed or from the Phase that will be completed by the current financing.



*A business plan which details the risks and contributions proposed to be made by all parties participating in the project, including bondholders, members of the proposer's team, and the Virginia Department of Transportation. Discuss your proposed approach to assignment/assumption of various project risks.*

This gives VDOT and STAR Solutions the flexibility to delay or even stop additional Phases of the project if additional financing costs become prohibitive, while STAR Solutions is still able to service all outstanding debt.

In addition, STAR Solutions recognizes that it will be critical to receive the expected federal earmark funds identified in its preliminary plan of finance. We plan to finance the construction of each Phase only when there is a tangible commitment of the anticipated federal and any Commonwealth funds. We recognize that projected federal funds may be subject to more than one federal surface transportation authorization. We expect to continue to work with VDOT, the Commonwealth, the Commonwealth's Congressional delegation and Congressional leadership to receive the required federal earmarks.

Toll Collection System. STAR Solutions proposes to be responsible for the design, installation, testing and ongoing operation of a 100 percent ETC system for I-81 Heavy Commercial Vehicles. STAR Solutions proposes to partner with VDOT to ensure that the I-81 ETC system is initially and remains compatible with other ETC systems over which VDOT has responsibility as well as with other ETC systems in contiguous states to facilitate I-81 users.

Competitive Facilities. STAR Solutions recognizes that VDOT is responsible to make improvements to public transportation assets to promote the economy and public safety. Although most such improvements are not likely to be seen as having a material adverse impact on the toll revenue capability of the project, certain types of improvements could be considered materially competitive with the I-81 project. Therefore, STAR Solutions proposes to negotiate with VDOT a non-compete covenant that would protect the project's ability to generate toll revenues by considering the effect on the project's financial viability if VDOT were to construct, finance or facilitate significant transportation improvements that could materially affect Heavy Commercial Vehicle traffic on I-81. Such a covenant would not impede improvements needed to maintain safe highway traveling conditions on other non-competing transportation facilities within the corridor. Further, as discussed in Tabs E and R, improvements to freight rail lines potentially can be advanced in tandem with our I-81 project, subject to thorough evaluation of the effect of such improvements on I-81 Heavy Commercial Vehicle traffic.

## **Proprietary & Confidential Information**

The 100 percent ETC system and VDOT's funding of Asset Management costs will mitigate lenders' risks that operating and maintenance costs reduce net revenues available for debt service. STAR Solutions anticipates that other operating risks will be mitigated through structural features in the toll revenue financing, including use of independent feasibility reports and inclusion in the financing documents of covenants regarding STAR Solutions' authority to establish toll rates, limitations on additional indebtedness and other terms that are reasonable and customary in toll revenue financings.



***A business plan which details the risks and contributions proposed to be made by all parties participating in the project, including bondholders, members of the proposer's team, and the Virginia Department of Transportation. Discuss your proposed approach to assignment/assumption of various project risks.***

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Nevertheless, as highlighted in the above summary table, STAR Solutions proposes to allocate risks relating to long-term levels of toll traffic and revenues to lenders, including both bondholders and the federal government's TIFIA program. We believe such risks can be thoroughly evaluated and absorbed by these parties. Further, as a path-breaking pilot program that addresses significant economic and safety challenges relating to the movement of freight in the 21st century, we believe that STAR Solutions' project is a natural target for subordinate federal credit assistance, which is designed to facilitate innovative long-term solutions to new and significant transportation problems.



***A business plan which details the risks and contributions proposed to be made by all parties participating in the project, including bondholders, members of the proposer's team, and the Virginia Department of Transportation. Discuss your proposed approach to assignment/assumption of various project risks.***

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## **LIST OF EXHIBITS**

- EXHIBIT 1: Sources and Uses of Funds During Project Construction, 2004-2018
- EXHIBIT 2: Uses of Proceeds and Net Debt Service on Toll Revenue Bonds Issued in 2005, 2010, 2012 and 2015
- EXHIBIT 3: Uses of Proceeds of Bond Anticipation Notes Issued in 2005, 2010, 2012 and 2015
- EXHIBIT 4: TIFIA Loan Drawdowns and Repayments
- EXHIBIT 5: Assumptions for the Plan of Finance and Projection of Operations
- EXHIBIT 6: Aggregate Projection of Operations and Debt Service Coverage, 2004-2054
- EXHIBIT 7: 2005 Projection of Operations and Debt Service Coverage, 2004-2054
- EXHIBIT 8: 2010 Projection of Operations and Debt Service Coverage, 2004-2054
- EXHIBIT 9: 2012 Projection of Operations and Debt Service Coverage, 2004-2054
- EXHIBIT 10: 2015 Projection of Operations and Debt Service Coverage, 2004-2054
- EXHIBIT 11: Closed Barrier Forecast from WSA (HV)

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 1</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>Project Financing</b>		
<i>Total Sources and Uses of Funds During Project Construction, 2004-2018</i>		
<b>Sources of Funds:</b>		
Toll Revenue Bonds		5,931,554,395
TIFIA Loan Par Amount		0
BANs		1,284,615,000
VDOT Additional Funding		0
VDOT Six Year Funding		98,000,000
Federal Earmarks		1,600,000,000
Toll Revenues (HV) - Systemwide Early		1,228,927,941
Toll Revenues (HV) - from Completed Phases		1,800,383,108
DSRF Earnings		114,465,628
Investment Income on Cash Balance		99,685,389
Cash Flow Notes Par Amount		900,000,000
<b>Total Sources</b>		<b>\$13,057,631,461</b>
<b>Uses of Funds:</b>		
Project Costs and Pavement Warranty		7,940,224,807
Costs of Issuance - Toll Revenue Bonds		118,631,088
Costs of Issuance - TIFIA Loans		0
Costs of Issuance - TIFIA Loans (BANs structure)		9,634,613
Costs of Issuance - BANs		12,846,150
Costs of Issuance - VDOT Additional Funding		0
Capitalized Interest Deposit - Toll Revenue Bonds (net of earnings)		645,722,634
Capitalized Interest Deposit - BANs (net of Earnings)		228,470,442
Debt Service Reserve Fund		593,155,439
Bond Insurance Premium		229,233,014
Debt Service on Toll Revenue Bonds		1,815,343,036
Loan Payments on TIFIA Loans		148,033,095
Toll Collection Costs (HV)		164,200,388
Toll Facilities Replacement Reserve Deposits		165,227,249
Cash Flow Notes Costs and Repayment		936,000,000
<b>Total Uses</b>		<b>\$13,006,721,954</b>
<b>Cumulative Surplus at End of 2018</b>		<b>\$50,909,506</b>

**Proprietary & Confidential  
Information**

**Proprietary & Confidential  
Information**

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<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 2</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>Toll Revenue Bonds</b>		
<i>Sources and Uses - Series 2005</i>		<b>Financing</b>
		<b>1/1/2005</b>
<b>SOURCES:</b>		
Par Amount of Bonds		1,270,722,085.45
Equity Contribution		-
Other Sources		-
Accrued Interest		-
<b>Total Sources</b>		<b>1,270,722,085.45</b>
<b>USES:</b>		
Deposit to Construction Fund		902,697,959.60
Capitalized Interest Fund Deposit		178,786,938.29
Debt Service Reserve Fund Deposit		127,072,208.55
Underwriter's Discount		-
Costs of Issuance		25,414,441.71
Municipal Bond Insurance		36,749,287.30
Accrued Interest		-
Project Contingency		-
Contingency (Rounding)		1,250.00
<b>Total Uses</b>		<b>1,270,722,085.45</b>
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		6.0212476%
True Interest Cost		6.0212476%
All-In Cost of Borrowing		6.1707094%
<b>Target Coverage Level</b>		<b>1.50x</b>
<b>Average Coverage Level</b>		<b>1.59x</b>
<b>Minimum Coverage Level</b>		<b>1.50x</b>
<b>Total Construction Fund Draws</b>		<b>902,697,959.60</b>
Dated Date		1/1/2005
Delivery Date		1/1/2005
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance		2.000%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		4.0000000%
Deposit to Construction Fund		2.0000000%
Capitalized Interest Fund Deposit		2.7500000%
<b>OTHER</b>		
Capitalized Interest		Yes
Interest Capitalized Through		04/01/2009
Debt Service Reserve Fund		Yes
Debt Service Reserve Fund Requirement		Lesser of Three
End of Construction		04/01/2009
Bond Insurance		Yes
<b>FOOTNOTES:</b>		

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 2</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>Toll Revenue Bonds</b>		
<i>Sources and Uses - Series 2010</i>		<b>Financing 1/1/2010</b>
<b>SOURCES:</b>		
Par Amount of Bonds		1,086,974,102.00
Equity Contribution		-
Other Sources		-
Accrued Interest		-
<b>Total Sources</b>		<b>1,086,974,102.00</b>
<b>USES:</b>		
Deposit to Construction Fund		873,629,578.22
Capitalized Interest Fund Deposit		39,908,839.47
Debt Service Reserve Fund Deposit		108,697,410.20
Underwriter's Discount		-
Costs of Issuance		21,739,482.04
Municipal Bond Insurance		42,997,542.08
Accrued Interest		-
Project Contingency		-
Contingency (Rounding)		1,250.00
<b>Total Uses</b>		<b>1,086,974,102.00</b>
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		6.5153847%
True Interest Cost		6.5153847%
All-In Cost of Borrowing		6.6372891%
<b>Target Coverage Level</b>		<b>1.50x</b>
<b>Average Coverage Level</b>		<b>1.50x</b>
<b>Minimum Coverage Level</b>		<b>1.50x</b>
<b>Total Construction Fund Draws</b>		<b>873,629,578.22</b>
Dated Date		1/1/2010
Delivery Date		1/1/2010
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance		2.000%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		4.0000000%
Deposit to Construction Fund		0.0000000%
Capitalized Interest Fund Deposit		2.7500000%
<b>OTHER</b>		
Capitalized Interest		Yes
Interest Capitalized Through		10/01/2011
Debt Service Reserve Fund		Yes
Debt Service Reserve Fund Requirement		Lesser of Three
End of Construction		10/01/2011
Bond Insurance		Yes
<b>FOOTNOTES:</b>		

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 2</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>Toll Revenue Bonds</b>		
<i>Sources and Uses - Series 2012</i>		<b>Financing 1/1/2012</b>
<b>SOURCES:</b>		
Par Amount of Bonds		2,216,361,195.05
Equity Contribution		-
Other Sources		-
Accrued Interest		-
Total Sources		2,216,361,195.05
<b>USES:</b>		
Deposit to Construction Fund		1,621,903,918.15
Capitalized Interest Fund Deposit		237,479,760.69
Debt Service Reserve Fund Deposit		221,636,119.51
Underwriter's Discount		-
Costs of Issuance		44,327,223.90
Municipal Bond Insurance		91,012,922.80
Accrued Interest		-
Project Contingency		-
Contingency (Rounding)		1,250.00
Total Uses		2,216,361,195.05
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		6.7813018%
True Interest Cost		6.7813018%
All-In Cost of Borrowing		6.9069088%
<b>Target Coverage Level</b>		<b>1.50x</b>
<b>Average Coverage Level</b>		<b>1.50x</b>
<b>Minimum Coverage Level</b>		<b>1.50x</b>
<b>Total Construction Fund Draws</b>		<b>1,621,903,918.15</b>
Dated Date		1/1/2012
Delivery Date		1/1/2012
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance		2.000%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		4.0000000%
Deposit to Construction Fund		0.0000000%
Capitalized Interest Fund Deposit		2.7500000%
<b>OTHER</b>		
Capitalized Interest		Yes
Interest Capitalized Through		07/01/2015
Debt Service Reserve Fund		Yes
Debt Service Reserve Fund Requirement		Lesser of Three
End of Construction		07/01/2015
Bond Insurance		Yes
<b>FOOTNOTES:</b>		

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 2</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>Toll Revenue Bonds</b>		
<i>Sources and Uses - Series 2015</i>		<b>Financing</b>
		<b>1/1/2015</b>
<b>SOURCES:</b>		
Par Amount of Bonds		1,357,497,012.30
Equity Contribution		-
Other Sources		-
Accrued Interest		-
<b>Total Sources</b>		<b>1,357,497,012.30</b>
<b>USES:</b>		
Deposit to Construction Fund		946,575,763.51
Capitalized Interest Fund Deposit		189,547,095.88
Debt Service Reserve Fund Deposit		135,749,701.23
Underwriter's Discount		-
Costs of Issuance		27,149,940.25
Municipal Bond Insurance		58,473,261.45
Accrued Interest		-
Project Contingency		-
Contingency (Rounding)		1,249.99
<b>Total Uses</b>		<b>1,357,497,012.30</b>
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		7.0518467%
True Interest Cost		7.0518467%
All-In Cost of Borrowing		7.1794639%
<b>Target Coverage Level</b>		<b>1.50x</b>
<b>Average Coverage Level</b>		<b>1.52x</b>
<b>Minimum Coverage Level</b>		<b>1.50x</b>
<b>Total Construction Fund Draws</b>		<b>946,575,763.51</b>
Dated Date		1/1/2015
Delivery Date		1/1/2015
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance		2.000%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		4.0000000%
Deposit to Construction Fund		0.0000000%
Capitalized Interest Fund Deposit		2.7500000%
<b>OTHER</b>		
Capitalized Interest		Yes
Interest Capitalized Through		04/01/2019
Debt Service Reserve Fund		Yes
Debt Service Reserve Fund Requirement		Lesser of Three
End of Construction		04/01/2019
Bond Insurance		Yes
<b>FOOTNOTES:</b>		

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 3</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>BANS Financing</b>		
<i>Sources and Uses - Series 2005</i>		<b>Financing</b>
		<b>1/1/2005</b>
<b>SOURCES:</b>		
Par Amount of BANS		239,235,000.00
Equity Contribution		
Other Sources		
Accrued Interest		
		<hr/>
Total Sources		239,235,000.00
<b>USES:</b>		
Deposit to Construction Fund		187,853,176.83
Capitalized Interest Fund Deposit		47,195,210.67
Debt Service Reserve Fund Deposit		-
Underwriter's Discount		-
Costs of Issuance (BANS)		2,392,350.00
Cost of Issuance (TIFIA Loan)		1,794,262.50
Municipal Bond Insurance		-
Accrued Interest		
Project Contingency		
Contingency (Rounding)		-
		<hr/>
Total Uses		239,235,000.00
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		4.25000%
True Interest Cost		4.64626%
All-In Cost of Borrowing		4.64626%
Dated Date		1/1/2005
Delivery Date		1/1/2005
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance (BANS)		1.000%
Cost of Issuance (TIFIA Loan)		0.750%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		3.000%
Deposit to Construction Fund		0.000%
Capitalized Interest Fund Deposit		2.750%

<u>OTHER</u>	
Capitalized Interest	Yes
Interest Capitalized Through	01/01/2010
Debt Service Reserve Fund	No
Debt Service Reserve Fund Requirement	N/A
End of Construction	04/01/2009
Bond Insurance	No
<u>FOOTNOTES:</u>	
BAN Final Maturity	01/01/2010

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 3</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>BANS Financing</b>		
<i>Sources and Uses - Series 2010</i>		<b>Financing</b>
		<b>1/1/2010</b>
<b>SOURCES:</b>		
Par Amount of BANS		240,575,000.00
Equity Contribution		
Other Sources		
Accrued Interest		
		<hr/>
Total Sources		240,575,000.00
<b>USES:</b>		
Deposit to Construction Fund		215,437,480.62
Capitalized Interest Fund Deposit		20,927,456.88
Debt Service Reserve Fund Deposit		-
Underwriter's Discount		-
Costs of Issuance (BANS)		2,405,750.00
Cost of Issuance (TIFIA Loan)		1,804,312.50
Municipal Bond Insurance		-
Accrued Interest		
Project Contingency		
Contingency (Rounding)		-
		<hr/>
Total Uses		240,575,000.00
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		4.50000%
True Interest Cost		5.43524%
All-In Cost of Borrowing		5.43524%
Dated Date		1/1/2010
Delivery Date		1/1/2010
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance (BANS)		1.000%
Cost of Issuance (TIFIA Loan)		0.750%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		3.000%
Deposit to Construction Fund		0.000%
Capitalized Interest Fund Deposit		2.750%

<u>OTHER</u>	
Capitalized Interest	Yes
Interest Capitalized Through	01/01/2012
Debt Service Reserve Fund	No
Debt Service Reserve Fund Requirement	N/A
End of Construction	10/01/2011
Bond Insurance	No
<u>FOOTNOTES:</u>	
BAN Final Maturity	01/01/2012

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 3</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>BANS Financing</b>		
<i>Sources and Uses - Series 2012</i>		<b>Financing</b>
		<b>1/1/2012</b>
<b>SOURCES:</b>		
Par Amount of BANS		495,790,000.00
Equity Contribution		
Other Sources		
Accrued Interest		
		<hr/>
Total Sources		495,790,000.00
<b>USES:</b>		
Deposit to Construction Fund		398,484,838.35
Capitalized Interest Fund Deposit		88,628,836.65
Debt Service Reserve Fund Deposit		-
Underwriter's Discount		-
Costs of Issuance (BANS)		4,957,900.00
Cost of Issuance (TIFIA Loan)		3,718,425.00
Municipal Bond Insurance		-
Accrued Interest		
Project Contingency		
Contingency (Rounding)		-
		<hr/>
Total Uses		495,790,000.00
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		4.75000%
True Interest Cost		5.24064%
All-In Cost of Borrowing		5.24064%
Dated Date		1/1/2012
Delivery Date		1/1/2012
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance (BANS)		1.000%
Cost of Issuance (TIFIA Loan)		0.750%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		3.000%
Deposit to Construction Fund		0.000%
Capitalized Interest Fund Deposit		2.750%

OTHER	
Capitalized Interest	Yes
Interest Capitalized Through	01/01/2016
Debt Service Reserve Fund	No
Debt Service Reserve Fund Requirement	N/A
End of Construction	07/01/2015
Bond Insurance	No
FOOTNOTES:	
BAN Final Maturity	01/01/2016

<b>STAR Solutions I-81 Detailed Proposal</b>		<b>EXHIBIT 3</b>
<b>Heavy Commercial Vehicles Only</b>		
<b>BANS Financing</b>		
<i>Sources and Uses - Series 2015</i>		<b>Financing</b>
		<b>1/1/2015</b>
<b>SOURCES:</b>		
Par Amount of BANS		309,015,000.00
Equity Contribution		
Other Sources		
Accrued Interest		
Total Sources		309,015,000.00
<b>USES:</b>		
Deposit to Construction Fund		231,888,299.93
Capitalized Interest Fund Deposit		71,718,937.57
Debt Service Reserve Fund Deposit		-
Underwriter's Discount		-
Costs of Issuance (BANS)		3,090,150.00
Cost of Issuance (TIFIA Loan)		2,317,612.50
Municipal Bond Insurance		-
Accrued Interest		
Project Contingency		
Contingency (Rounding)		-
Total Uses		309,015,000.00
<b>ASSUMPTIONS / SUMMARY STATISTICS:</b>		
Arbitrage Yield		5.00000%
True Interest Cost		5.40409%
All-In Cost of Borrowing		5.40409%
Dated Date		1/1/2015
Delivery Date		1/1/2015
<b>BOND ISSUANCE EXPENSES:</b>		
Underwriter's Discount		0.000%
Costs of Issuance (BANS)		1.000%
Cost of Issuance (TIFIA Loan)		0.750%
Municipal Bond Insurance		1.000%
<b>INVESTMENT RATES:</b>		
Debt Service Reserve Fund Deposit		3.000%
Deposit to Construction Fund		0.000%
Capitalized Interest Fund Deposit		2.750%

<u>OTHER</u>	
Capitalized Interest	Yes
Interest Capitalized Through	01/01/2020
Debt Service Reserve Fund	No
Debt Service Reserve Fund Requirement	N/A
End of Construction	04/01/2019
Bond Insurance	No
<u>FOOTNOTES:</u>	
BAN Final Maturity	01/01/2020

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only TIFIA Loan							EXHIBIT 4
TIFIA Loan Drawdown and Repayment Schedule - Series 2005 Tranche							Financing 1/1/2010
Date	Beginning Balance	Deferred Interest on Period Ending Bal @ 5.700%	Loan Principal Repayment	Loan Interest Repayment	Total Loan Repayment	Construction/COI Drawdowns	Ending Balance
1/1/2005	-	-	-	-	-	-	-
7/1/2005	-	-	-	-	-	-	-
1/1/2006	-	-	-	-	-	-	-
7/1/2006	-	-	-	-	-	-	-
1/1/2007	-	-	-	-	-	-	-
7/1/2007	-	-	-	-	-	-	-
1/1/2008	-	-	-	-	-	-	-
7/1/2008	-	-	-	-	-	-	-
1/1/2009	-	-	-	-	-	-	-
7/1/2009	-	-	-	-	-	-	-
1/1/2010	239,232,653.41	-	-	-	-	-	239,232,653.41
7/1/2010	239,232,653.41	6,818,130.62	-	-	-	-	246,050,784.03
1/1/2011	246,050,784.03	7,012,447.34	-	-	-	-	253,063,231.38
7/1/2011	253,063,231.38	7,212,302.09	-	-	-	-	260,275,533.47
1/1/2012	260,275,533.47	7,417,852.70	-	-	-	-	267,693,386.18
7/1/2012	267,693,386.18	7,629,261.51	-	-	-	-	275,322,647.68
1/1/2013	275,322,647.68	7,846,695.46	-	-	-	-	283,169,343.14
7/1/2013	283,169,343.14	8,070,326.28	-	-	-	-	291,239,669.42
1/1/2014	291,239,669.42	8,300,330.58	-	-	-	-	<b>299,540,000.00</b>
7/1/2014	-	-	-	8,536,890.00	8,536,890.00	-	-
1/1/2015	-	-	11,505,000.00	8,536,890.00	20,041,890.00	-	-
7/1/2015	-	-	-	8,208,997.50	8,208,997.50	-	-
1/1/2016	-	-	7,550,000.00	8,208,997.50	15,758,997.50	-	-
7/1/2016	-	-	-	7,993,822.50	7,993,822.50	-	-
1/1/2017	-	-	2,750,000.00	7,993,822.50	10,743,822.50	-	-
7/1/2017	-	-	-	7,915,447.50	7,915,447.50	-	-
1/1/2018	-	-	3,915,000.00	7,915,447.50	11,830,447.50	-	-
7/1/2018	-	-	-	7,803,870.00	7,803,870.00	-	-
1/1/2019	-	-	5,200,000.00	7,803,870.00	13,003,870.00	-	-
7/1/2019	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2020	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2020	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2021	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2021	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2022	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2022	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2023	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2023	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2024	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2024	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2025	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2025	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2026	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2026	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2027	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2027	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2028	-	-	-	7,655,670.00	7,655,670.00	-	-
7/1/2028	-	-	-	7,655,670.00	7,655,670.00	-	-
1/1/2029	-	-	515,000.00	7,655,670.00	8,170,670.00	-	-
7/1/2029	-	-	-	7,640,992.50	7,640,992.50	-	-
1/1/2030	-	-	1,295,000.00	7,640,992.50	8,935,992.50	-	-
7/1/2030	-	-	-	7,604,085.00	7,604,085.00	-	-
1/1/2031	-	-	2,150,000.00	7,604,085.00	9,754,085.00	-	-
7/1/2031	-	-	-	7,542,810.00	7,542,810.00	-	-
1/1/2032	-	-	3,095,000.00	7,542,810.00	10,637,810.00	-	-
7/1/2032	-	-	-	7,454,602.50	7,454,602.50	-	-
1/1/2033	-	-	4,125,000.00	7,454,602.50	11,579,602.50	-	-
7/1/2033	-	-	-	7,337,040.00	7,337,040.00	-	-
1/1/2034	-	-	5,260,000.00	7,337,040.00	12,597,040.00	-	-
7/1/2034	-	-	-	7,187,130.00	7,187,130.00	-	-
1/1/2035	-	-	13,500,000.00	7,187,130.00	20,687,130.00	-	-

The balance in the box above is the principal amount that will be repaid over the remaining life of the TIFIA Loan. The costs of issuance are paid from the first draw of the Loan.

**Virginia Department of Transportation  
Interstate 81 Improvements**

**Figure T-4: TIFIA Loan Drawdowns and Repayments**

7/1/2035	-	6,802,380.00	6,802,380.00	
1/1/2036	15,585,000.00	6,802,380.00	22,387,380.00	
7/1/2036	-	6,358,207.50	6,358,207.50	
1/1/2037	17,850,000.00	6,358,207.50	24,208,207.50	
7/1/2037	-	5,849,482.50	5,849,482.50	
1/1/2038	20,310,000.00	5,849,482.50	26,159,482.50	
7/1/2038	-	5,270,647.50	5,270,647.50	
1/1/2039	22,980,000.00	5,270,647.50	28,250,647.50	
7/1/2039	-	4,615,717.50	4,615,717.50	
1/1/2040	25,875,000.00	4,615,717.50	30,490,717.50	
7/1/2040	-	3,878,280.00	3,878,280.00	
1/1/2041	29,005,000.00	3,878,280.00	32,883,280.00	
7/1/2041	-	3,051,637.50	3,051,637.50	
1/1/2042	32,180,000.00	3,051,637.50	35,231,637.50	
7/1/2042	-	2,134,507.50	2,134,507.50	
1/1/2043	35,605,000.00	2,134,507.50	37,739,507.50	
7/1/2043	-	1,119,765.00	1,119,765.00	
1/1/2044	39,290,000.00	1,119,765.00	40,409,765.00	
7/1/2044	-	-	-	
1/1/2045	-	-	-	
<b>Total</b>	<b>60,307,346.59</b>	<b>299,540,000.00</b>	<b>401,726,025.00</b>	<b>701,266,025.00</b>
Interest Rate				5.700%

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only TIFIA Loan							EXHIBIT 4
TIFIA Loan Drawdown and Repayment Schedule - Series 2010 Tranche							Financing 1/1/2012
Date	Beginning Balance	Deferred Interest on Period Ending Bal @ 5.950%	Loan Principal Repayment	Loan Interest Repayment	Total Loan Repayment	Construction/COI Drawdowns	Ending Balance
1/1/2010	-					-	-
7/1/2010	-	-				-	-
1/1/2011	-	-				-	-
7/1/2011	-	-				-	-
1/1/2012	240,573,448.98	-				-	240,573,448.98
7/1/2012	240,573,448.98	7,157,060.11				-	247,730,509.08
1/1/2013	247,730,509.08	7,369,982.65				-	255,100,491.73
7/1/2013	255,100,491.73	7,589,239.63				-	262,689,731.36
1/1/2014	262,689,731.36	7,815,019.51				-	270,504,750.86
7/1/2014	270,504,750.86	8,047,516.34				-	278,552,267.20
1/1/2015	278,552,267.20	8,286,929.95				-	286,839,197.15
7/1/2015	286,839,197.15	8,533,466.12				-	295,372,663.27
1/1/2016	295,372,663.27	8,787,336.73				-	304,160,000.00
7/1/2016	304,160,000.00	9,048,760.00				-	313,208,760.00
1/1/2017	313,208,760.00	9,317,960.61				-	322,526,720.61
7/1/2017	322,526,720.61		-	9,048,760.00	9,048,760.00		
1/1/2018	-		-	9,048,760.00	9,048,760.00		
7/1/2018	-		-	9,048,760.00	9,048,760.00		
1/1/2019	-		-	9,048,760.00	9,048,760.00		
7/1/2019	-		-	9,048,760.00	9,048,760.00		
1/1/2020	-		-	9,048,760.00	9,048,760.00		
7/1/2020	-		-	9,048,760.00	9,048,760.00		
1/1/2021	-		-	9,048,760.00	9,048,760.00		
7/1/2021	-		-	9,048,760.00	9,048,760.00		
1/1/2022	-		-	9,048,760.00	9,048,760.00		
7/1/2022	-		-	9,048,760.00	9,048,760.00		
1/1/2023	-		-	9,048,760.00	9,048,760.00		
7/1/2023	-		-	9,048,760.00	9,048,760.00		
1/1/2024	-		-	9,048,760.00	9,048,760.00		
7/1/2024	-		-	9,048,760.00	9,048,760.00		
1/1/2025	-		-	9,048,760.00	9,048,760.00		
7/1/2025	-		-	9,048,760.00	9,048,760.00		
1/1/2026	-		550,000.00	9,048,760.00	9,598,760.00		
7/1/2026	-		-	9,032,397.50	9,032,397.50		
1/1/2027	-		1,395,000.00	9,032,397.50	10,427,397.50		
7/1/2027	-		-	8,990,896.25	8,990,896.25		
1/1/2028	-		2,335,000.00	8,990,896.25	11,325,896.25		
7/1/2028	-		-	8,921,430.00	8,921,430.00		
1/1/2029	-		3,365,000.00	8,921,430.00	12,286,430.00		
7/1/2029	-		-	8,821,321.25	8,821,321.25		
1/1/2030	-		4,500,000.00	8,821,321.25	13,321,321.25		
7/1/2030	-		-	8,687,446.25	8,687,446.25		
1/1/2031	-		5,740,000.00	8,687,446.25	14,427,446.25		
7/1/2031	-		-	8,516,681.25	8,516,681.25		
1/1/2032	-		7,105,000.00	8,516,681.25	15,621,681.25		
7/1/2032	-		-	8,305,307.50	8,305,307.50		
1/1/2033	-		8,590,000.00	8,305,307.50	16,895,307.50		
7/1/2033	-		-	8,049,755.00	8,049,755.00		
1/1/2034	-		10,220,000.00	8,049,755.00	18,269,755.00		
7/1/2034	-		-	7,745,710.00	7,745,710.00		
1/1/2035	-		11,995,000.00	7,745,710.00	19,740,710.00		
7/1/2035	-		-	7,388,858.75	7,388,858.75		
1/1/2036	-		13,925,000.00	7,388,858.75	21,313,858.75		
7/1/2036	-		-	6,974,590.00	6,974,590.00		
1/1/2037	-		16,030,000.00	6,974,590.00	23,004,590.00		
7/1/2037	-		-	6,497,697.50	6,497,697.50		
1/1/2038	-		11,885,000.00	6,497,697.50	18,382,697.50		
7/1/2038	-		-	6,144,118.75	6,144,118.75		
1/1/2039	-		13,705,000.00	6,144,118.75	19,849,118.75		
7/1/2039	-		-	5,736,395.00	5,736,395.00		
1/1/2040	-		15,675,000.00	5,736,395.00	21,411,395.00		

The balance in the box above is the principal amount that will be repaid over the remaining life of the TIFIA Loan. The costs of issuance are paid from the first draw of the Loan.

**Virginia Department of Transportation  
Interstate 81 Improvements**

**Figure T-4a: TIFIA Loan Drawdowns and Repayments**

7/1/2040	-	5,270,063.75	5,270,063.75	
1/1/2041	17,820,000.00	5,270,063.75	23,090,063.75	
7/1/2041	-	4,739,918.75	4,739,918.75	
1/1/2042	20,000,000.00	4,739,918.75	24,739,918.75	
7/1/2042	-	4,144,918.75	4,144,918.75	
1/1/2043	22,360,000.00	4,144,918.75	26,504,918.75	
7/1/2043	-	3,479,708.75	3,479,708.75	
1/1/2044	24,905,000.00	3,479,708.75	28,384,708.75	
7/1/2044	-	2,738,785.00	2,738,785.00	
1/1/2045	27,650,000.00	2,738,785.00	30,388,785.00	
7/1/2045	-	1,916,197.50	1,916,197.50	
1/1/2046	30,610,000.00	1,916,197.50	32,526,197.50	
7/1/2046	-	1,005,550.00	1,005,550.00	
1/1/2047	33,800,000.00	1,005,550.00	34,805,550.00	
7/1/2047	-	-	-	
1/1/2048	-	-	-	
7/1/2048	-	-	-	
1/1/2049	-	-	-	
7/1/2049	-	-	-	
1/1/2050	-	-	-	
<b>Total</b>	<b>81,953,271.63</b>	<b>304,160,000.00</b>	<b>429,093,175.00</b>	<b>733,253,175.00</b>
<b>Interest Rate on Balance</b>				<b>5.950%</b>

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only TIFIA Loan 2011 Tranche TIFIA Loan Drawdown and Repayment Schedule - Series 2012 Tranche							EXHIBIT 4
							Financing 1/1/2016
Date	Beginning Balance	Deferred Interest on Period Ending Bal @ 6.200%	Loan Principal Repayment	Loan Interest Repayment	Total Loan Repayment	Construction/COI Drawdowns	Ending Balance
1/1/2012	-	-	-	-	-	-	-
7/1/2012	-	-	-	-	-	-	-
1/1/2013	-	-	-	-	-	-	-
7/1/2013	-	-	-	-	-	-	-
1/1/2014	-	-	-	-	-	-	-
7/1/2014	-	-	-	-	-	-	-
1/1/2015	-	-	-	-	-	-	-
7/1/2015	-	-	-	-	-	-	-
1/1/2016	495,788,730.92	-	-	-	-	-	495,788,730.92
7/1/2016	495,788,730.92	15,369,450.66	-	-	-	-	511,158,181.58
1/1/2017	511,158,181.58	15,845,903.63	-	-	-	-	527,004,085.21
7/1/2017	527,004,085.21	16,337,126.64	-	-	-	-	543,341,211.85
1/1/2018	543,341,211.85	16,843,577.57	-	-	-	-	560,184,789.41
7/1/2018	560,184,789.41	17,365,728.47	-	-	-	-	577,550,517.89
1/1/2019	577,550,517.89	17,904,066.05	-	-	-	-	595,454,583.94
7/1/2019	595,454,583.94	18,459,092.10	-	-	-	-	613,913,676.04
1/1/2020	613,913,676.04	19,031,323.96	-	-	-	-	632,945,000.00
7/1/2020	632,945,000.00	19,621,295.00	-	-	-	-	652,566,295.00
1/1/2021	652,566,295.00	20,229,555.15	-	-	-	-	672,795,850.15
7/1/2021	-	-	-	19,621,295.00	19,621,295.00	-	-
1/1/2022	-	-	-	19,621,295.00	19,621,295.00	-	-
7/1/2022	-	-	-	19,621,295.00	19,621,295.00	-	-
1/1/2023	-	-	-	19,621,295.00	19,621,295.00	-	-
7/1/2023	-	-	-	19,621,295.00	19,621,295.00	-	-
1/1/2024	-	-	-	19,621,295.00	19,621,295.00	-	-
7/1/2024	-	-	-	19,621,295.00	19,621,295.00	-	-
1/1/2025	-	-	-	19,621,295.00	19,621,295.00	-	-
7/1/2025	-	-	-	19,621,295.00	19,621,295.00	-	-
1/1/2026	-	-	-	19,621,295.00	19,621,295.00	-	-
7/1/2026	-	-	-	19,621,295.00	19,621,295.00	-	-
1/1/2027	-	-	425,000.00	19,621,295.00	20,046,295.00	-	-
7/1/2027	-	-	-	19,608,120.00	19,608,120.00	-	-
1/1/2028	-	-	2,185,000.00	19,608,120.00	21,793,120.00	-	-
7/1/2028	-	-	-	19,540,385.00	19,540,385.00	-	-
1/1/2029	-	-	4,135,000.00	19,540,385.00	23,675,385.00	-	-
7/1/2029	-	-	-	19,412,200.00	19,412,200.00	-	-
1/1/2030	-	-	6,290,000.00	19,412,200.00	25,702,200.00	-	-
7/1/2030	-	-	-	19,217,210.00	19,217,210.00	-	-
1/1/2031	-	-	8,670,000.00	19,217,210.00	27,887,210.00	-	-
7/1/2031	-	-	-	18,948,440.00	18,948,440.00	-	-
1/1/2032	-	-	11,280,000.00	18,948,440.00	30,228,440.00	-	-
7/1/2032	-	-	-	18,598,760.00	18,598,760.00	-	-
1/1/2033	-	-	14,155,000.00	18,598,760.00	32,753,760.00	-	-
7/1/2033	-	-	-	18,159,955.00	18,159,955.00	-	-
1/1/2034	-	-	17,295,000.00	18,159,955.00	35,454,955.00	-	-
7/1/2034	-	-	-	17,623,810.00	17,623,810.00	-	-
1/1/2035	-	-	20,740,000.00	17,623,810.00	38,363,810.00	-	-
7/1/2035	-	-	-	16,980,870.00	16,980,870.00	-	-
1/1/2036	-	-	24,505,000.00	16,980,870.00	41,485,870.00	-	-
7/1/2036	-	-	-	16,221,215.00	16,221,215.00	-	-
1/1/2037	-	-	28,620,000.00	16,221,215.00	44,841,215.00	-	-
7/1/2037	-	-	-	15,333,995.00	15,333,995.00	-	-
1/1/2038	-	-	33,110,000.00	15,333,995.00	48,443,995.00	-	-
7/1/2038	-	-	-	14,307,585.00	14,307,585.00	-	-
1/1/2039	-	-	37,995,000.00	14,307,585.00	52,302,585.00	-	-
7/1/2039	-	-	-	13,129,740.00	13,129,740.00	-	-
1/1/2040	-	-	43,310,000.00	13,129,740.00	56,439,740.00	-	-
7/1/2040	-	-	-	11,787,130.00	11,787,130.00	-	-
1/1/2041	-	-	49,100,000.00	11,787,130.00	60,887,130.00	-	-
7/1/2041	-	-	-	10,265,030.00	10,265,030.00	-	-
1/1/2042	-	-	18,095,000.00	10,265,030.00	28,360,030.00	-	-

The balance in the box above is the principal amount that will be repaid over the remaining life of the TIFIA Loan. The costs of issuance are paid from the first draw of the Loan.

**Virginia Department of Transportation  
Interstate 81 Improvements**

**Figure T-4b: TIFIA Loan Drawdowns and Repayments**

7/1/2042	-	9,704,085.00	9,704,085.00		
1/1/2043	20,745,000.00	9,704,085.00	30,449,085.00		
7/1/2043	-	9,060,990.00	9,060,990.00		
1/1/2044	23,625,000.00	9,060,990.00	32,685,990.00		
7/1/2044	-	8,328,615.00	8,328,615.00		
1/1/2045	26,740,000.00	8,328,615.00	35,068,615.00		
7/1/2045	-	7,499,675.00	7,499,675.00		
1/1/2046	30,120,000.00	7,499,675.00	37,619,675.00		
7/1/2046	-	6,565,955.00	6,565,955.00		
1/1/2047	33,780,000.00	6,565,955.00	40,345,955.00		
7/1/2047	-	5,518,775.00	5,518,775.00		
1/1/2048	37,740,000.00	5,518,775.00	43,258,775.00		
7/1/2048	-	4,348,835.00	4,348,835.00		
1/1/2049	42,015,000.00	4,348,835.00	46,363,835.00		
7/1/2049	-	3,046,370.00	3,046,370.00		
1/1/2050	46,640,000.00	3,046,370.00	49,686,370.00		
7/1/2050	-	1,600,530.00	1,600,530.00		
1/1/2051	51,630,000.00	1,600,530.00	53,230,530.00		
7/1/2051	-	-	-		
1/1/2052	-	-	-		
<b>Total</b>	<b>177,007,119.23</b>	<b>632,945,000.00</b>	<b>845,072,090.00</b>	<b>1,478,017,090.00</b>	<b>-</b>
Interest Rate on Balance					6.200%

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only TIFIA Loan 2015 Tranche TIFIA Loan Drawdown and Repayment Schedule - Series 2015 Tranche							EXHIBIT 4
							Financing 1/1/2020
Date	Beginning Balance	Deferred Interest on Period Ending Bal @ 6.450%	Loan Principal Repayment	Loan Interest Repayment	Total Loan Repayment	Construction/COI Drawdowns	Ending Balance
1/1/2015	-					-	-
7/1/2015	-	-				-	-
1/1/2016	-	-				-	-
7/1/2016	-	-				-	-
1/1/2017	-	-				-	-
7/1/2017	-	-				-	-
1/1/2018	-	-				-	-
7/1/2018	-	-				-	-
1/1/2019	-	-				-	-
7/1/2019	-	-				-	-
1/1/2020	309,011,602.79	-				-	309,011,602.79
7/1/2020	309,011,602.79	9,965,624.19				-	318,977,226.98
1/1/2021	318,977,226.98	10,287,015.57				-	329,264,242.55
7/1/2021	329,264,242.55	10,618,771.82				-	339,883,014.38
1/1/2022	339,883,014.38	10,961,227.21				-	350,844,241.59
7/1/2022	350,844,241.59	11,314,726.79				-	362,158,968.38
1/1/2023	362,158,968.38	11,679,626.73				-	373,838,595.11
7/1/2023	373,838,595.11	12,056,294.69				-	385,894,889.80
1/1/2024	385,894,889.80	12,445,110.20				-	<b>398,340,000.00</b>
7/1/2024			-	12,846,465.00	12,846,465.00		
1/1/2025			-	12,846,465.00	12,846,465.00		
7/1/2025			-	12,846,465.00	12,846,465.00		
1/1/2026			-	12,846,465.00	12,846,465.00		
7/1/2026			-	12,846,465.00	12,846,465.00		
1/1/2027			-	12,846,465.00	12,846,465.00		
7/1/2027			-	12,846,465.00	12,846,465.00		
1/1/2028			-	12,846,465.00	12,846,465.00		
7/1/2028			-	12,846,465.00	12,846,465.00		
1/1/2029			-	12,846,465.00	12,846,465.00		
7/1/2029			-	12,846,465.00	12,846,465.00		
1/1/2030			175,000.00	12,846,465.00	13,021,465.00		
7/1/2030			-	12,840,821.25	12,840,821.25		
1/1/2031			1,320,000.00	12,840,821.25	14,160,821.25		
7/1/2031			-	12,798,251.25	12,798,251.25		
1/1/2032			2,590,000.00	12,798,251.25	15,388,251.25		
7/1/2032			-	12,714,723.75	12,714,723.75		
1/1/2033			4,000,000.00	12,714,723.75	16,714,723.75		
7/1/2033			-	12,585,723.75	12,585,723.75		
1/1/2034			5,555,000.00	12,585,723.75	18,140,723.75		
7/1/2034			-	12,406,575.00	12,406,575.00		
1/1/2035			7,270,000.00	12,406,575.00	19,676,575.00		
7/1/2035			-	12,172,117.50	12,172,117.50		
1/1/2036			9,155,000.00	12,172,117.50	21,327,117.50		
7/1/2036			-	11,876,868.75	11,876,868.75		
1/1/2037			11,230,000.00	11,876,868.75	23,106,868.75		
7/1/2037			-	11,514,701.25	11,514,701.25		
1/1/2038			13,505,000.00	11,514,701.25	25,019,701.25		
7/1/2038			-	11,079,165.00	11,079,165.00		
1/1/2039			15,995,000.00	11,079,165.00	27,074,165.00		
7/1/2039			-	10,563,326.25	10,563,326.25		
1/1/2040			18,725,000.00	10,563,326.25	29,288,326.25		
7/1/2040			-	9,959,445.00	9,959,445.00		
1/1/2041			21,705,000.00	9,959,445.00	31,664,445.00		
7/1/2041			-	9,259,458.75	9,259,458.75		
1/1/2042			24,745,000.00	9,259,458.75	34,004,458.75		
7/1/2042			-	8,461,432.50	8,461,432.50		
1/1/2043			28,055,000.00	8,461,432.50	36,516,432.50		
7/1/2043			-	7,556,658.75	7,556,658.75		
1/1/2044			10,395,000.00	7,556,658.75	17,951,658.75		
7/1/2044			-	7,221,420.00	7,221,420.00		
1/1/2045			12,070,000.00	7,221,420.00	19,291,420.00		

The balance in the box above is the principal amount that will be repaid over the remaining life of the TIFIA Loan. The costs of issuance are paid from the first draw of the Loan.

**Virginia Department of Transportation  
Interstate 81 Improvements**

**Figure T-4c: TIFIA Loan Drawdowns and Repayments**

7/1/2045	-	6,832,162.50	6,832,162.50	
1/1/2046	13,900,000.00	6,832,162.50	20,732,162.50	
7/1/2046	-	6,383,887.50	6,383,887.50	
1/1/2047	15,895,000.00	6,383,887.50	22,278,887.50	
7/1/2047	-	5,871,273.75	5,871,273.75	
1/1/2048	18,055,000.00	5,871,273.75	23,926,273.75	
7/1/2048	-	5,289,000.00	5,289,000.00	
1/1/2049	20,400,000.00	5,289,000.00	25,689,000.00	
7/1/2049	-	4,631,100.00	4,631,100.00	
1/1/2050	22,945,000.00	4,631,100.00	27,576,100.00	
7/1/2050	-	3,891,123.75	3,891,123.75	
1/1/2051	25,705,000.00	3,891,123.75	29,596,123.75	
7/1/2051	-	3,062,137.50	3,062,137.50	
1/1/2052	28,525,000.00	3,062,137.50	31,587,137.50	
7/1/2052	-	2,142,206.25	2,142,206.25	
1/1/2053	31,570,000.00	2,142,206.25	33,712,206.25	
7/1/2053	-	1,124,073.75	1,124,073.75	
1/1/2054	34,855,000.00	1,124,073.75	35,979,073.75	
7/1/2054	-	-	-	
1/1/2055	-	-	-	
<b>Total</b>	<b>89,328,397.21</b>	<b>398,340,000.00</b>	<b>558,632,887.50</b>	<b>956,972,887.50</b>
Interest Rate on Balance				6.450%

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only		EXHIBIT 5
<i>Assumptions</i>		
<b>ASSUMPTIONS:</b>		
<b>Federal and State Resources:</b>		
Federal Earmarks	(2004-2009)	\$800 million
	(2010-2015)	\$800 million
VDOT Funding	(2004-2009)	\$98 million
	(2010-2018)	\$0
<b>Borrowing Rates</b>		
Toll Revenue Bonds	2005 Issue	Current Municipal Market Rates Plus 25 BPs
	Subsequent Issues	25 BPs Added to Each Subsequent Issue
TIFIA Loan	2005 Loan	Current 30-Year Treasury Rate Plus 25 BPs
	Subsequent Issues	25 BPs Added to each Subsequent Issue
BANs	2005 Issue	4.25%
	Subsequent Issues	25 BPs Added to each Subsequent Issue
<b>Debt Service Coverage Target</b>		
Toll Revenue Bonds		1.50 x
Aggregate Debt		1.15 x
<b>Interest Earnings</b>		
Cash Balance		2.00%
DSRF Balance		4.00%
Capitalized Interest Deposit		2.75%
<b>Project Timing (January 1):</b>		
<b>Phase 1:</b>	Bond Issuance	2005
	Project Opening	2009
<b>Phase 2:</b>	Bond Issuance	2010
	Project Opening	2011
<b>Phase 3:</b>	Bond Issuance	2012
	Project Opening	2015
<b>Phase 4:</b>	Bond Issuance	2015
	Project Opening	2019
<b>Capital Costs to be Funded</b>		
Project Costs from KBR (in 2003\$)		\$5,720,632,325
Toll Civil Costs Heavy CV (in 2003\$)		\$27,087,060
Toll Eqpt. And Civil Costs Light CV/PC		\$0
Annual Inflation Rate		2.50%
KPRI Services and Warranty (in Disbursement Year \$)		\$834,052,997
Annual Inflation Rate		0.00%
<b>Toll Rate Assumptions for Heavy Commercial Vehicles</b>		
Systemwide Early Toll Rate (2007-2018)		12.30 cents/mile beginning in 2007
Completed Phase Toll Rate (2009-2054)		23.40 cents/mile beginning in 2009

Annual Inflation Rate (2007-2018)	3.00%
Annual Inflation Rate (2019-2054)	2.50%
<b>Toll Rate Assumptions for Light Commercial Vehicles and Passenger Cars</b>	
Light CV Early Toll Rate (2006-2018)	None
Passenger Car Early Toll Rate (2006-2018)	None
Light CV Completed Phase Toll Rate (2009-2054)	None
Passenger Car Completed Phase Toll Rate (2009-2054)	None
Annual Rate Increase (2004-2018)	None
Annual Rate Increase (2019-2054)	None
<b>Toll Traffic Growth Rate</b>	
2006-2030	WSA Forecast
2031-2040	2.00%
2041-2050	1.50%
2051-2060	1.00%
<b>Operating and Maintenance Costs:</b>	
Heavy CV Tolls Only (2003\$)	\$11,902,414 beginning in 2007
Light CV and PC Tolls for all 6 plazas (2002\$)	None
Annual Inflation Rate (2004-2018)	3.00%
Annual Inflation Rate (2019-2054)	2.50%

STAR Solutions I-81 Detailed Proposal  
Heavy Commercial Vehicles Only

EXHIBIT 6

Forecast of Operations and Debt Service Coverage, 2004-2054

Bond Year Ending	Calendar Year	Gross Toll Revenues (1)	Annual Growth in Revenues (2)	Earnings/Corpus on DSRF	Total Revenues	Toll Collection Expenses (3)	Net Revs Available for Debt Service	Bond Debt Service (4)	Bond Coverage (5)	Net Revs Available for TIFIA (6)	TIFIA Debt Service (7)	Bond & TIFIA Debt Service	Bond & TIFIA Coverage (8)	Remaining Revenues (9)
1/1/2005	2004													
1/1/2006	2005	-			-	-	-	-	N/A	-	-	-	N/A	-
1/1/2007	2006	-			-	-	-	-	N/A	-	-	-	N/A	-
1/1/2008	2007	39,499,101			39,499,101	(11,902,414)	27,596,687	-	N/A	27,596,687	-	-	N/A	27,596,687
1/1/2009	2008	98,807,209	150.15%		98,807,209	(12,199,975)	86,607,234	-	N/A	86,607,234	-	-	N/A	86,607,234
1/1/2010	2009	178,956,993	81.12%	5,082,803	184,039,796	(12,504,974)	171,534,822	37,253,411	4.60x	134,281,410	-	37,253,411	4.60x	134,281,410
1/1/2011	2010	194,987,236	8.96%	5,082,803	200,070,039	(12,817,598)	187,252,440	124,831,215	1.50x	62,421,225	-	124,831,215	1.50x	62,421,225
1/1/2012	2011	213,254,541	9.37%	7,256,721	220,511,262	(13,138,038)	207,373,224	133,312,952	1.56x	74,060,272	-	133,312,952	1.56x	74,060,272
1/1/2013	2012	249,061,995	16.79%	9,430,639	258,492,634	(13,466,489)	245,026,145	163,348,163	1.50x	81,677,982	-	163,348,163	1.50x	81,677,982
1/1/2014	2013	262,669,255	5.46%	9,430,639	272,099,894	(13,803,152)	258,296,742	172,193,163	1.50x	86,103,580	-	172,193,163	1.50x	86,103,580
1/1/2015	2014	277,020,149	5.46%	9,430,639	286,450,788	(14,148,230)	272,302,558	181,528,163	1.50x	90,774,395	28,578,780	210,106,943	1.30x	62,195,615
1/1/2016	2015	325,048,598	17.34%	13,863,329	338,911,926	(14,501,936)	324,409,990	203,447,923	1.59x	120,962,068	23,967,995	227,415,918	1.43x	96,994,073
1/1/2017	2016	376,645,194	15.87%	18,296,019	394,941,213	(14,864,485)	380,076,728	253,377,683	1.50x	126,699,046	18,737,645	272,115,328	1.40x	107,961,401
1/1/2018	2017	396,325,855	5.23%	18,296,019	414,621,874	(15,236,097)	399,385,777	266,247,683	1.50x	133,138,094	37,843,415	304,091,098	1.31x	95,294,679
1/1/2019	2018	417,034,922	5.23%	18,296,019	435,330,941	(15,616,999)	419,713,942	279,802,683	1.50x	139,911,260	38,905,260	318,707,943	1.32x	101,006,000
1/1/2020	2019	423,670,782	1.59%	23,725,962	447,396,744	(16,007,424)	431,389,320	275,622,373	1.57x	155,766,947	33,408,860	309,031,233	1.40x	122,358,087
1/1/2021	2020	451,923,394	6.67%	23,725,962	475,649,356	(16,407,610)	459,241,746	306,152,270	1.50x	153,089,476	33,408,860	339,561,130	1.35x	119,680,616
1/1/2022	2021	472,485,908	4.55%	23,725,962	496,211,870	(16,817,800)	479,394,070	319,587,270	1.50x	159,806,800	72,651,450	392,238,720	1.22x	87,155,350
1/1/2023	2022	493,984,017	4.55%	23,725,962	517,709,979	(17,238,245)	500,471,734	333,637,270	1.50x	166,834,464	72,651,450	406,288,720	1.23x	94,183,014
1/1/2024	2023	516,460,290	4.55%	23,725,962	540,186,252	(17,669,201)	522,517,051	348,337,270	1.50x	174,179,781	72,651,450	420,988,720	1.24x	101,528,331
1/1/2025	2024	539,959,233	4.55%	23,725,962	563,685,195	(18,110,931)	545,574,264	363,702,270	1.50x	181,871,994	98,344,380	462,046,650	1.18x	83,527,614
1/1/2026	2025	564,527,378	4.55%	23,725,962	588,253,340	(18,563,704)	569,689,636	379,782,270	1.50x	189,907,366	98,894,380	478,676,650	1.19x	91,012,986
1/1/2027	2026	590,213,374	4.55%	23,725,962	613,939,336	(19,027,797)	594,911,539	396,597,270	1.50x	198,314,269	100,131,655	496,728,925	1.20x	98,182,614
1/1/2028	2027	617,068,082	4.55%	23,725,962	640,794,044	(19,503,492)	621,290,552	414,177,270	1.50x	207,113,282	102,722,303	516,899,573	1.20x	104,390,980
1/1/2029	2028	645,144,680	4.55%	23,725,962	668,870,642	(19,991,079)	648,879,563	432,577,270	1.50x	216,302,293	105,942,900	538,520,170	1.20x	110,359,393
1/1/2030	2029	674,498,763	4.55%	23,725,962	698,224,725	(20,490,856)	677,733,869	451,812,270	1.50x	225,921,599	109,701,958	561,514,228	1.21x	116,219,641
1/1/2031	2030	705,188,457	4.55%	23,725,962	728,914,418	(21,003,128)	707,911,291	471,932,270	1.50x	235,979,021	114,579,125	586,511,395	1.21x	121,399,896
1/1/2032	2031	737,274,531	4.55%	23,725,962	761,000,493	(21,528,206)	739,472,287	492,972,270	1.50x	246,500,017	119,682,365	612,654,635	1.21x	126,817,652
1/1/2033	2032	770,820,523	4.55%	23,725,962	794,546,484	(22,066,411)	772,480,074	514,977,270	1.50x	257,502,804	125,016,788	639,994,058	1.21x	132,486,016
1/1/2034	2033	805,892,856	4.55%	23,725,962	829,618,818	(22,618,071)	807,000,747	537,987,270	1.50x	269,013,477	130,594,948	668,582,218	1.21x	138,418,530
1/1/2035	2034	842,560,981	4.55%	23,725,962	866,286,943	(23,183,523)	843,103,420	562,062,270	1.50x	281,041,150	143,431,450	705,493,720	1.20x	137,609,700
1/1/2036	2035	880,897,506	4.55%	23,725,962	904,623,468	(23,763,111)	880,860,357	587,237,270	1.50x	293,623,087	149,858,453	737,095,723	1.20x	143,764,634
1/1/2037	2036	920,978,342	4.55%	23,725,962	944,704,304	(24,357,189)	920,347,116	613,552,270	1.50x	306,794,846	156,591,763	770,144,033	1.20x	150,203,083
1/1/2038	2037	962,882,857	4.55%	23,725,962	986,608,819	(24,966,119)	961,642,700	641,087,270	1.50x	320,555,430	157,201,753	798,289,023	1.20x	163,353,678
1/1/2039	2038	1,006,694,027	4.55%	23,725,962	1,030,419,989	(25,590,272)	1,004,829,717	669,879,410	1.50x	334,950,307	164,278,033	834,157,443	1.20x	170,672,275
1/1/2040	2039	1,052,498,605	4.55%	23,725,962	1,076,224,567	(26,230,028)	1,049,994,539	699,990,020	1.50x	350,004,519	171,675,358	871,665,378	1.20x	178,329,161
1/1/2041	2040	1,100,387,292	4.55%	23,725,962	1,124,113,254	(26,885,779)	1,097,227,475	731,469,850	1.50x	365,757,625	179,419,838	910,889,688	1.20x	186,337,787
1/1/2042	2041	1,144,815,429	4.04%	23,725,962	1,168,541,391	(27,557,923)	1,140,983,467	760,650,815	1.50x	380,332,652	149,652,090	910,302,905	1.25x	230,680,562
1/1/2043	2042	1,191,037,352	4.04%	23,725,962	1,214,763,314	(28,246,872)	1,186,516,442	790,998,770	1.50x	395,517,672	155,654,888	946,653,658	1.25x	239,862,784
1/1/2044	2043	1,239,125,485	4.04%	23,725,962	1,262,851,447	(28,953,043)	1,233,898,403	822,585,040	1.50x	411,313,363	140,649,245	963,234,285	1.28x	270,664,118
1/1/2045	2044	1,289,155,176	4.04%	150,796,033	1,439,951,209	(29,676,869)	1,410,274,339	940,177,115	1.50x	470,097,224	103,037,640	1,043,214,755	1.35x	367,059,584
1/1/2046	2045	1,341,204,816	4.04%	18,643,159	1,359,847,975	(30,418,791)	1,329,429,184	735,971,055	1.81x	593,458,129	107,126,070	843,097,125	1.58x	486,332,059
1/1/2047	2046	1,395,355,961	4.04%	18,643,159	1,413,999,120	(31,179,261)	1,382,819,859	765,181,055	1.81x	617,638,804	111,385,785	876,566,840	1.58x	506,253,019
1/1/2048	2047	1,451,693,458	4.04%	18,643,159	1,470,336,617	(31,958,742)	1,438,377,874	795,571,055	1.81x	642,806,819	78,575,098	874,146,153	1.65x	564,231,722
1/1/2049	2048	1,510,305,581	4.04%	18,643,159	1,528,948,740	(32,757,711)	1,496,191,029	827,196,055	1.81x	668,994,974	81,690,670	908,886,725	1.65x	587,304,304
1/1/2050	2049	1,571,284,169	4.04%	127,339,058	1,698,623,227	(33,576,654)	1,665,046,573	932,557,363	1.79x	732,489,210	84,939,940	1,017,497,303	1.64x	647,549,270
1/1/2051	2050	1,634,724,767	4.04%	14,295,323	1,649,020,090	(34,416,070)	1,614,604,020	874,553,228	2.39x	940,050,793	88,318,308	762,871,535	2.12x	851,732,485
1/1/2052	2051	1,692,348,815	3.53%	235,929,820	1,928,278,636	(35,276,472)	1,893,002,164	845,751,468	2.24x	1,047,250,696	34,649,275	880,400,743	2.15x	1,012,601,421
1/1/2053	2052	1,752,004,111	3.52%	5,429,943	1,757,434,054	(36,158,384)	1,721,275,671	262,949,588	6.55x	1,458,326,083	35,854,413	298,804,000	5.76x	1,422,471,671
1/1/2054	2053	1,813,762,256	3.53%	5,429,943	1,819,192,199	(37,062,343)	1,782,129,856	272,087,963	6.55x	1,510,041,893	37,103,148	309,191,110	5.76x	1,472,938,746

Virginia Department of Transportation  
Interstate 81 Improvements

Figure T-6: Aggregate Projection of Operations  
and Debt Service Coverage, 2004-2054

1/1/2055	2054	1,877,697,375	3.52%	141,178,525	2,018,875,900	(37,988,902)	1,980,886,998	372,053,858	5.32x	1,608,833,141	-	372,053,858	5.32x	1,608,833,141
Totals		39,709,837,678	10.10%	1,462,585,958	41,172,423,635	(1,081,448,402)	40,090,975,233	22,158,759,974	1.94x	17,932,215,259	3,869,509,178	26,028,269,151	1.71x	14,062,706,082

Notes:

- (1) The Gross Annual Toll Revenues are based on Wilbur Smith estimates provided August 2003, and adjusted for 3.0% annual rate increases from 2001 to 2018 and by 2.50% per year thereafter.
- (2) Computed based on the Gross Annual Toll Revenues. The average annual percentage increase is presented in the "Totals" row.
- (3) Toll Collection Expenses are based on TransCore estimates provided January 2003, and adjusted for inflation by 2.50% from 2001 to 2018 and by 2.50% from 2019 on.  
It is assumed that VDOT will pay for Asset Management expenses, except for pavement under warranty and toll facilities funded by the toll facilities replacement reserve.
- (4) Net of Capitalized Interest.
- (5) Coverage level is the Net Revenues Available for Debt Service divided by the Bond Debt Service. The average annual coverage is presented in the "Totals" row.
- (6) Excess Revenues after payment of Bond Debt Service.
- (7) Interest on the TIFIA Loan is deferred through the first five years after completion of each Phase and is accrued and added to the balance of the Loan to be repaid.
- (8) Bond and TIFIA coverage is the Net Revenues Available for Debt Service divided by the sum of Bond and TIFIA Debt Service. The average annual coverage is presented in the "Totals" row.
- (9) Remaining Revenues are first applied to equipment facilities reserve; residual revenues are applied to project costs through 2018 and then are available to VDOT for Asset Management costs.

<b>STAR Solutions I-81 Detailed Proposal</b>						<b>EXHIBIT 6</b>
<b>Heavy Commercial Vehicles Only</b>						
<i>Equipment Facilities Replacement Reserve Deposits</i>						
<b>Bond Year Ending</b>	<b>Excess Revenues</b>	<b>Replacement Years</b>	<b>Replacement Cost / yr 3.00%</b>	<b>Amortized Cost/yr 3.00%</b>	<b>Excess Revenues (1)</b>	
1/1/08	27,596,687			12,564,461	15,032,226	
1/1/09	86,607,234			12,564,461	74,042,773	
1/1/10	134,281,410			12,564,461	121,716,950	
1/1/11	62,421,225			12,564,461	49,856,765	
1/1/12	74,060,272			12,564,461	61,495,811	
1/1/13	81,677,982			12,564,461	69,113,522	
1/1/14	86,103,580	1/1/14	96,274,705	12,564,461	73,539,119	
1/1/15	62,195,615			15,455,205	46,740,410	
1/1/16	96,994,073			15,455,205	81,538,868	
1/1/17	107,961,401			15,455,205	92,506,196	
1/1/18	95,294,679			15,455,205	79,839,474	
1/1/19	101,006,000			15,455,205	85,550,795	
1/1/20	122,358,087			15,455,205	106,902,882	
1/1/21	119,680,616	1/1/21	118,424,923	15,455,205	104,225,411	
1/1/22	87,155,350			19,009,492	68,145,858	
1/1/23	94,183,014			19,009,492	75,173,522	
1/1/24	101,528,331			19,009,492	82,518,839	
1/1/25	83,527,614			19,009,492	64,518,122	
1/1/26	91,012,986			19,009,492	72,003,494	
1/1/27	98,182,614			19,009,492	79,173,122	
1/1/28	104,390,980	1/1/28	145,659,513	19,009,492	85,381,488	
1/1/29	110,359,393			23,383,064	86,976,328	
1/1/30	116,219,641			23,383,064	92,836,577	
1/1/31	121,399,896			23,383,064	98,016,832	
1/1/32	126,817,652			23,383,064	103,434,588	
1/1/33	132,486,016			23,383,064	109,102,952	
1/1/34	138,418,530			23,383,064	115,035,465	
1/1/35	137,609,700	1/1/35	179,171,846	23,383,064	114,226,636	
1/1/36	143,764,634			28,762,878	115,001,756	
1/1/37	150,203,083			28,762,878	121,440,205	
1/1/38	163,353,678			28,762,878	134,590,800	
1/1/39	170,672,275			28,762,878	141,909,397	
1/1/40	178,329,161			28,762,878	149,566,283	
1/1/41	186,337,787			28,762,878	157,574,909	
1/1/42	230,680,562	1/1/42	220,394,464	28,762,878	201,917,684	
1/1/43	239,862,784			30,517,008	209,345,776	
1/1/44	270,664,118			30,517,008	240,147,110	
1/1/45	367,059,584			30,517,008	336,542,576	
1/1/46	486,332,059			30,517,008	455,815,051	
1/1/47	506,253,019			30,517,008	475,736,011	
1/1/48	564,231,722			30,517,008	533,714,713	
1/1/49	587,304,304	1/1/49	233,835,423	30,517,008	556,787,296	
1/1/50	647,549,270			37,535,111	610,014,159	
1/1/51	851,732,485			37,535,111	814,197,375	
1/1/52	1,012,601,421			37,535,111	975,066,311	
1/1/53	1,422,471,671			37,535,111	1,384,936,560	
1/1/54	1,472,938,746			37,535,111	1,435,403,635	
1/1/55	1,608,833,141			37,535,111	1,571,298,030	

(1) Excess Revenues applied to project costs through 2018 and then are available to VDOT for Asset Management costs.

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing										
EXHIBIT 7										
<i>Debt Service Coverage - Series 2005</i>										
Year Ended Calendar Year	1/1/2005 2004	1/1/2006 2005	1/1/2007 2006	1/1/2008 2007	1/1/2009 2008	1/1/2010 2009	1/1/2011 2010	1/1/2012 2011	1/1/2013 2012	1/1/2014 2013
Toll Revenues (HV) - Early Systemwide	0	0	0	39,499,101	98,807,209	139,151,092	138,812,732	138,507,787	121,241,519	127,764,198
Toll Revenues (HV) - Phase 1	0	0	0	0	0	39,805,901	56,174,504	59,293,025	62,584,670	66,059,051
DSRF Earnings - Phase 1	0	0	0	0	0	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
	0	0	0	39,499,101	98,807,209	184,039,796	200,070,039	202,883,614	188,908,992	198,906,052
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
Net Revenues	0	0	0	27,596,687	86,607,234	171,534,822	187,252,440	189,745,576	175,442,503	185,102,900
Debt Service on Toll Revenue Bonds - Phase 1 Coverage	0 n/a	0 n/a	0 n/a	0 n/a	0 n/a	37,253,411 4.60 x	124,831,215 1.50 x	126,496,215 1.50 x	116,961,215 1.50 x	123,401,215 1.50 x
Loan Payments on TIFIA Loan - Phase 1 Combined Coverage	0 n/a	0 n/a	0 n/a	0 n/a	0 n/a	0 4.60 x	0 1.50 x	0 1.50 x	0 1.50 x	0 1.50 x
Excess Revenues	-	-	-	27,596,686.91	86,607,234.12	134,281,410.37	62,421,225.21	63,249,360.84	58,481,287.70	61,701,685.43

EXHIBIT 7

**STAR Solutions I-81 Detailed Proposal**  
**Heavy Commercial Vehicles Only**  
**Project Financing**

*Debt Service Coverage - Series 2005*

Year Ended Calendar Year	1/1/2015 2014	1/1/2016 2015	1/1/2017 2016	1/1/2018 2017	1/1/2019 2018	1/1/2020 2019	1/1/2021 2020	1/1/2022 2021	1/1/2023 2022	1/1/2024 2023
Toll Revenues (HV) - Early Systemwide	134,637,841	99,608,126	60,374,962	63,576,199	66,947,174	16,067,789	0	0	0	0
Toll Revenues (HV) - Phase I	69,726,311	73,597,159	77,457,536	81,520,400	85,796,373	82,322,344	86,219,797	90,142,797	94,244,295	98,532,410
DSRF Earnings - Phase I	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
	<u>209,446,956</u>	<u>178,288,088</u>	<u>142,915,301</u>	<u>150,179,402</u>	<u>157,826,350</u>	<u>103,472,936</u>	<u>91,302,599</u>	<u>95,225,600</u>	<u>99,327,097</u>	<u>103,615,213</u>
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase I	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	14,148,230	14,501,936	14,864,485	15,236,097	15,616,999	16,007,424	16,407,610	16,817,800	17,238,245	17,669,201
	<u>14,148,230</u>	<u>14,501,936</u>	<u>14,864,485</u>	<u>15,236,097</u>	<u>15,616,999</u>	<u>16,007,424</u>	<u>16,407,610</u>	<u>16,817,800</u>	<u>17,238,245</u>	<u>17,669,201</u>
Net Revenues	<u>195,298,725</u>	<u>163,786,152</u>	<u>128,050,816</u>	<u>134,943,305</u>	<u>142,209,350</u>	<u>87,465,512</u>	<u>74,894,990</u>	<u>78,407,800</u>	<u>82,088,852</u>	<u>85,946,012</u>
Debt Service on Toll Revenue Bonds - Phase I Coverage	130,196,215 1.50 x	109,186,215 1.50 x	85,366,215 1.50 x	89,961,215 1.50 x	94,806,215 1.50 x	58,306,215 1.50 x	49,926,215 1.50 x	52,271,215 1.50 x	54,721,215 1.50 x	57,296,215 1.50 x
Loan Payments on TIFIA Loan - Phase I Combined Coverage	28,578,780 1.23 x	23,967,995 1.23 x	18,737,645 1.23 x	19,745,895 1.23 x	20,807,740 1.23 x	15,311,340 1.19 x	15,311,340 1.15 x	15,311,340 1.16 x	15,311,340 1.17 x	15,311,340 1.18 x
Excess Revenues	36,523,730.18	30,631,941.72	23,946,956.37	25,236,195.35	26,595,395.48	13,847,956.57	9,657,434.67	10,825,245.17	12,056,297.45	13,338,456.73

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing										
Debt Service Coverage - Series 2005										
Year Ended Calendar Year	1/1/2025 2024	1/1/2026 2025	1/1/2027 2026	1/1/2028 2027	1/1/2029 2028	1/1/2030 2029	1/1/2031 2030	1/1/2032 2031	1/1/2033 2032	1/1/2034 2033
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase 1	103,015,635	107,702,846	112,603,325	117,726,777	123,083,345	128,683,637	134,538,743	140,660,256	147,060,297	153,751,541
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
	108,098,437	112,785,649	117,686,128	122,809,580	128,166,148	133,766,440	139,621,546	145,743,058	152,143,100	158,834,344
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071
	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071
Net Revenues	89,987,506	94,221,944	98,658,331	103,306,088	108,175,069	113,275,584	118,618,418	124,214,853	130,076,689	136,216,272
Debt Service on Toll Revenue Bonds - Phase 1 Coverage	59,991,215 1.50 x	62,811,215 1.50 x	65,771,215 1.50 x	68,866,215 1.50 x	72,116,215 1.50 x	75,516,215 1.50 x	79,076,215 1.50 x	82,806,215 1.50 x	86,716,215 1.50 x	90,806,215 1.50 x
Loan Payments on TIFIA Loan - Phase 1 Combined Coverage	15,311,340 1.20 x	15,311,340 1.21 x	15,311,340 1.22 x	15,311,340 1.23 x	15,826,340 1.23 x	16,576,985 1.23 x	17,358,170 1.23 x	18,180,620 1.23 x	19,034,205 1.23 x	19,934,080 1.23 x
Excess Revenues	14,684,951.36	16,099,389.46	17,575,776.34	19,128,532.72	20,232,513.77	21,182,384.00	22,184,033.09	23,228,017.70	24,326,269.19	25,475,977.44

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing										
EXHIBIT 7										
Debt Service Coverage - Series 2005										
Year Ended Calendar Year	1/1/2035 2034	1/1/2036 2035	1/1/2037 2036	1/1/2038 2037	1/1/2039 2038	1/1/2040 2039	1/1/2041 2040	1/1/2042 2041	1/1/2043 2042	1/1/2044 2043
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase I	160,747,236	168,061,235	175,708,021	183,702,736	192,061,211	200,799,996	209,936,396	218,412,578	227,230,986	236,405,437
DSRF Earnings - Phase I	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
	165,830,039	173,144,038	180,790,824	188,785,539	197,144,014	205,882,799	215,019,199	223,495,381	232,313,788	241,488,239
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase I	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043
	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043
Net Revenues	142,646,516	149,380,927	156,433,635	163,819,421	171,553,742	179,652,770	188,133,420	195,937,457	204,066,917	212,535,196
Debt Service on Toll Revenue Bonds - Phase I Coverage	95,096,215 1.50 x	99,586,215 1.50 x	104,286,215 1.50 x	109,211,215 1.50 x	114,368,355 1.50 x	119,763,965 1.50 x	125,418,795 1.50 x	130,624,760 1.50 x	136,042,715 1.50 x	141,688,985 1.50 x
Loan Payments on TIFIA Loan - Phase I Combined Coverage	27,874,260 1.16 x	29,189,760 1.16 x	30,566,415 1.16 x	32,008,965 1.16 x	33,521,295 1.16 x	35,106,435 1.16 x	36,761,560 1.16 x	38,283,275 1.16 x	39,874,015 1.16 x	41,529,530 1.16 x
Excess Revenues	19,676,040.77	20,604,951.93	21,581,005.35	22,599,240.60	23,664,092.14	24,782,370.44	25,953,064.55	27,029,422.05	28,150,186.79	29,316,681.04

<b>STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing</b>												<b>EXHIBIT 7</b>
<i>Debt Service Coverage - Series 2005</i>												
<b>Year Ended Calendar Year</b>	1/1/2045 2044	1/1/2046 2045	1/1/2047 2046	1/1/2048 2047	1/1/2049 2048	1/1/2050 2049	1/1/2051 2050	1/1/2052 2051	1/1/2053 2052	1/1/2054 2053	1/1/2055 2054	
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0	
Toll Revenues (HV) - Phase I	245,950,306	255,880,550	266,211,727	276,960,025	288,142,286	299,776,031	311,879,488	322,873,240	334,254,522	346,036,994	358,234,798	
DSRF Earnings - Phase I	132,152,874											
	<u>378,103,180</u>	<u>255,880,550</u>	<u>266,211,727</u>	<u>276,960,025</u>	<u>288,142,286</u>	<u>299,776,031</u>	<u>311,879,488</u>	<u>322,873,240</u>	<u>334,254,522</u>	<u>346,036,994</u>	<u>358,234,798</u>	
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase I	0	0	0	0	0	0	0	0	0	0	0	
Fixed O&M Costs	29,676,869	30,418,791	31,179,261	31,958,742	32,757,711	33,576,654	34,416,070	35,276,472	36,158,384	37,062,343	37,988,902	
	<u>29,676,869</u>	<u>30,418,791</u>	<u>31,179,261</u>	<u>31,958,742</u>	<u>32,757,711</u>	<u>33,576,654</u>	<u>34,416,070</u>	<u>35,276,472</u>	<u>36,158,384</u>	<u>37,062,343</u>	<u>37,988,902</u>	
Net Revenues	<u>348,426,310</u>	<u>225,461,758</u>	<u>235,032,466</u>	<u>245,001,283</u>	<u>255,384,575</u>	<u>266,199,377</u>	<u>277,463,418</u>	<u>287,596,768</u>	<u>298,096,138</u>	<u>308,974,651</u>	<u>320,245,896</u>	
Debt Service on Toll Revenue Bonds - Phase I Coverage	232,281,060 1.50 x	0 n/a										
Loan Payments on TIFIA Loan - Phase I Combined Coverage	0 1.50 x	0 n/a										
Excess Revenues	116,145,250.32	225,461,758.50	235,032,465.91	245,001,282.86	255,384,575.32	266,199,377.36	277,463,418.27	287,596,768.48	298,096,138.41	308,974,650.72	320,245,896.18	

STAR Solutions I-81 Detailed Proposal										
Heavy Commercial Vehicles Only										
Project Financing										
<i>Debt Service Coverage - Series 2010</i>										
Year Ended	1/1/2005	1/1/2006	1/1/2007	1/1/2008	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013	1/1/2014
Calendar Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Toll Revenues (HV) - Early Systemwide	0	0	0	39,499,101	98,807,209	139,151,092	138,812,732	138,507,787	121,241,519	127,764,198
Toll Revenues (HV) - Phase 1	0	0	0	0	0	39,805,901	56,174,504	59,293,025	62,584,670	66,059,051
Toll Revenues (HV) - Phase 2	0	0	0	0	0	0	0	15,453,730	65,235,806	68,846,006
DSRF Earnings - Phase 1	0	0	0	0	0	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	0	0	0	0	0	0	0	2,173,918	4,347,836	4,347,836
	0	0	0	39,499,101	98,807,209	184,039,796	200,070,039	220,511,262	258,492,634	272,099,894
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
Net Revenues	0	0	0	27,596,687	86,607,234	171,534,822	187,252,440	207,373,224	245,026,145	258,296,742
Debt Service on Toll Revenue Bonds - Phase 1	0	0	0	0	0	37,253,411	124,831,215	126,496,215	116,961,215	123,401,215
Debt Service on Toll Revenue Bonds - Phase 2	0	0	0	0	0	0	0	6,816,737	46,386,948	48,791,948
Total Coverage	0	0	0	0	0	37,253,411	124,831,215	133,312,952	163,348,163	172,193,163
	n/a	n/a	n/a	n/a	n/a	4.60 x	1.50 x	1.56 x	1.50 x	1.50 x
Loan Payments on TIFIA Loan - Phase 1	0	0	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 2	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Combined Bond Debt Service/TIFIA Loan Combined Coverage	0	0	0	0	0	37,253,411	124,831,215	133,312,952	163,348,163	172,193,163
	n/a	n/a	n/a	n/a	n/a	4.60 x	1.50 x	1.56 x	1.50 x	1.50 x
Excess Revenues	-	-	-	27,596,686.91	86,607,234.12	134,281,410.37	62,421,225.21	74,060,271.88	81,677,982.28	86,103,579.98

EXHIBIT 8

**STAR Solutions I-81 Detailed Proposal  
Heavy Commercial Vehicles Only  
Project Financing**

*Debt Service Coverage - Series 2010*

Year Ended Calendar Year	1/1/2015 2014	1/1/2016 2015	1/1/2017 2016	1/1/2018 2017	1/1/2019 2018	1/1/2020 2019	1/1/2021 2020	1/1/2022 2021	1/1/2023 2022	1/1/2024 2023
Toll Revenues (HV) - Early Systemwide	134,637,841	99,608,126	60,374,962	63,576,199	66,947,174	16,067,789	0	0	0	0
Toll Revenues (HV) - Phase 1	69,726,311	73,597,159	77,457,536	81,520,400	85,796,373	82,322,344	86,219,797	90,142,797	94,244,295	98,532,410
Toll Revenues (HV) - Phase 2	72,655,996	76,676,833	80,717,352	84,970,785	89,448,352	85,846,229	89,931,234	94,023,105	98,301,157	102,773,859
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836
	286,450,788	259,312,757	227,980,489	239,498,023	251,622,538	193,667,000	185,581,669	193,596,541	201,976,090	210,736,908
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	14,148,230	14,501,936	14,864,485	15,236,097	15,616,999	16,007,424	16,407,610	16,817,800	17,238,245	17,669,201
	14,148,230	14,501,936	14,864,485	15,236,097	15,616,999	16,007,424	16,407,610	16,817,800	17,238,245	17,669,201
Net Revenues	272,302,558	244,810,821	213,116,004	224,261,926	236,005,539	177,659,576	169,174,060	176,778,741	184,737,845	193,067,707
Debt Service on Toll Revenue Bonds - Phase 1	130,196,215	109,186,215	85,366,215	89,961,215	94,806,215	58,306,215	49,926,215	52,271,215	54,721,215	57,296,215
Debt Service on Toll Revenue Bonds - Phase 2	51,331,948	54,011,948	56,706,948	59,541,948	62,526,948	60,126,948	62,851,948	65,576,948	68,431,948	71,411,948
Total Coverage	181,528,163 1.50 x	163,198,163 1.50 x	142,073,163 1.50 x	149,503,163 1.50 x	157,333,163 1.50 x	118,433,163 1.50 x	112,778,163 1.50 x	117,848,163 1.50 x	123,153,163 1.50 x	128,708,163 1.50 x
Loan Payments on TIFIA Loan - Phase 1	28,578,780	23,967,995	18,737,645	19,745,895	20,807,740	15,311,340	15,311,340	15,311,340	15,311,340	15,311,340
Loan Payments on TIFIA Loan - Phase 2	0	0	0	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520
Total	28,578,780	23,967,995	18,737,645	37,843,415	38,905,260	33,408,860	33,408,860	33,408,860	33,408,860	33,408,860
Combined Bond Debt Service/TIFIA Loan Combined Coverage	210,106,943 1.30 x	187,166,158 1.31 x	160,810,808 1.33 x	187,346,578 1.20 x	196,238,423 1.20 x	151,842,023 1.17 x	146,187,023 1.16 x	151,257,023 1.17 x	156,562,023 1.18 x	162,117,023 1.19 x
Excess Revenues	62,195,615.01	57,644,663.55	52,305,196.75	36,915,348.90	39,767,116.25	25,817,553.70	22,987,037.20	25,521,718.85	28,175,822.42	30,950,684.32

EXHIBIT 8

**STAR Solutions I-81 Detailed Proposal  
Heavy Commercial Vehicles Only  
Project Financing**

*Debt Service Coverage - Series 2010*

Year Ended Calendar Year	1/1/2025 2024	1/1/2026 2025	1/1/2027 2026	1/1/2028 2027	1/1/2029 2028	1/1/2030 2029	1/1/2031 2030	1/1/2032 2031	1/1/2033 2032	1/1/2034 2033
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase 1	103,015,635	107,702,846	112,603,325	117,726,777	123,083,345	128,683,637	134,538,743	140,660,256	147,060,297	153,751,541
Toll Revenues (HV) - Phase 2	107,450,070	112,339,048	117,450,475	122,794,471	128,381,620	134,222,983	140,330,129	146,715,150	153,390,689	160,369,966
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836
	219,896,343	229,472,533	239,484,439	249,951,887	260,895,604	272,337,259	284,299,511	296,806,044	309,881,625	323,552,145
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071
	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071
Net Revenues	201,785,412	210,908,828	220,456,642	230,448,395	240,904,524	251,846,403	263,296,383	275,277,839	287,815,214	300,934,074
Debt Service on Toll Revenue Bonds - Phase 1	59,991,215	62,811,215	65,771,215	68,866,215	72,116,215	75,516,215	79,076,215	82,806,215	86,716,215	90,806,215
Debt Service on Toll Revenue Bonds - Phase 2	74,526,948	77,786,948	81,196,948	84,756,948	88,481,948	92,376,948	96,451,948	100,706,948	105,156,948	109,806,948
Total Coverage	134,518,163 1.50 x	140,598,163 1.50 x	146,968,163 1.50 x	153,623,163 1.50 x	160,598,163 1.50 x	167,893,163 1.50 x	175,528,163 1.50 x	183,513,163 1.50 x	191,873,163 1.50 x	200,613,163 1.50 x
Loan Payments on TIFIA Loan - Phase 1	15,311,340	15,311,340	15,311,340	15,311,340	15,826,340	16,576,985	17,358,170	18,180,620	19,034,205	19,934,080
Loan Payments on TIFIA Loan - Phase 2	18,097,520	18,647,520	19,459,795	20,316,793	21,207,860	22,142,643	23,114,893	24,138,363	25,200,615	26,319,510
Total	33,408,860	33,958,860	34,771,135	35,628,133	37,034,200	38,719,628	40,473,063	42,318,983	44,234,820	46,253,590
Combined Bond Debt Service/TIFIA Loan Combined Coverage	167,927,023 1.20 x	174,557,023 1.21 x	181,739,298 1.21 x	189,251,295 1.22 x	197,632,363 1.22 x	206,612,790 1.22 x	216,001,225 1.22 x	225,832,145 1.22 x	236,107,983 1.22 x	246,866,753 1.22 x
Excess Revenues	33,858,389.54	36,351,805.81	38,717,344.38	41,197,099.85	43,272,161.84	45,233,613.26	47,295,158.09	49,445,693.58	51,707,231.89	54,067,321.50

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing										
EXHIBIT 8										
Debt Service Coverage - Series 2010										
Year Ended Calendar Year	1/1/2035 2034	1/1/2036 2035	1/1/2037 2036	1/1/2038 2037	1/1/2039 2038	1/1/2040 2039	1/1/2041 2040	1/1/2042 2041	1/1/2043 2042	1/1/2044 2043
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase 1	160,747,236	168,061,235	175,708,021	183,702,736	192,061,211	200,799,996	209,936,396	218,412,578	227,230,986	236,405,437
Toll Revenues (HV) - Phase 2	167,666,799	175,295,638	183,271,590	191,610,447	200,328,723	209,443,680	218,973,367	227,814,417	237,012,424	246,581,800
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836
	337,844,674	352,787,512	368,410,250	384,743,822	401,820,572	419,674,314	438,340,401	455,657,633	473,674,048	492,417,876
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043
	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043
Net Revenues	314,661,151	329,024,401	344,053,061	359,777,704	376,230,301	393,444,286	411,454,622	428,099,710	445,427,176	463,464,832
Debt Service on Toll Revenue Bonds - Phase 1	95,096,215	99,586,215	104,286,215	109,211,215	114,368,355	119,763,965	125,418,795	130,624,760	136,042,715	141,688,985
Debt Service on Toll Revenue Bonds - Phase 2	114,671,948	119,761,948	125,076,948	130,636,948	136,446,948	142,526,948	148,876,948	154,771,948	160,901,948	167,281,948
Total Coverage	209,768,163 1.50 x	219,348,163 1.50 x	229,363,163 1.50 x	239,848,163 1.50 x	250,815,303 1.50 x	262,290,913 1.50 x	274,295,743 1.50 x	285,396,708 1.50 x	296,944,663 1.50 x	308,970,933 1.50 x
Loan Payments on TIFIA Loan - Phase 1	27,874,260	29,189,760	30,566,415	32,008,965	33,521,295	35,106,435	36,761,560	38,283,275	39,874,015	41,529,530
Loan Payments on TIFIA Loan - Phase 2	27,486,420	28,702,718	29,979,180	24,880,395	25,993,238	27,147,790	28,360,128	29,479,838	30,649,838	31,864,418
Total	55,360,680	57,892,478	60,545,595	56,889,360	59,514,533	62,254,225	65,121,688	67,763,113	70,523,853	73,393,948
Combined Bond Debt Service/TIFIA Loan Combined Coverage	265,128,843 1.19 x	277,240,640 1.19 x	289,908,758 1.19 x	296,737,523 1.21 x	310,329,835 1.21 x	324,545,138 1.21 x	339,417,430 1.21 x	353,159,820 1.21 x	367,468,515 1.21 x	382,364,880 1.21 x
Excess Revenues	49,532,308.26	51,783,761.28	54,144,303.75	63,040,181.34	65,900,465.73	68,899,148.42	72,037,192.45	74,939,889.64	77,958,661.45	81,099,952.31

STAR Solutions I-81 Detailed Proposa												EXHIBIT 8
Heavy Commercial Vehicles Only												
Project Financing												
Debt Service Coverage - Series 2010												
Year Ended	1/1/2045	1/1/2046	1/1/2047	1/1/2048	1/1/2049	1/1/2050	1/1/2051	1/1/2052	1/1/2053	1/1/2054	1/1/2055	
Calendar Year	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0	
Toll Revenues (HV) - Phase 1	245,950,306	255,880,550	266,211,727	276,960,025	288,142,286	299,776,031	311,879,488	322,873,240	334,254,522	346,036,994	358,234,798	
Toll Revenues (HV) - Phase 2	256,537,541	266,895,244	277,671,139	288,882,111	300,545,727	312,680,260	325,304,726	336,771,717	348,642,921	360,932,583	373,655,457	
DSRF Earnings - Phase 1	132,152,874											
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	113,043,734						
	638,988,556	527,123,629	548,230,702	570,189,973	593,035,849	725,500,026	637,184,214	659,644,958	682,897,443	706,969,578	731,890,255	
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0	0	
Fixed O&M Costs	29,676,869	30,418,791	31,179,261	31,958,742	32,757,711	33,576,654	34,416,070	35,276,472	36,158,384	37,062,343	37,988,902	
	29,676,869	30,418,791	31,179,261	31,958,742	32,757,711	33,576,654	34,416,070	35,276,472	36,158,384	37,062,343	37,988,902	
Net Revenues	609,311,687	496,704,838	517,051,441	538,231,230	560,278,138	691,923,372	602,768,144	624,368,486	646,739,059	669,907,234	693,901,353	
Debt Service on Toll Revenue Bonds - Phase 1	232,281,060	0	0	0	0	0	0	0	0	0	0	
Debt Service on Toll Revenue Bonds - Phase 2	173,921,948	180,826,948	188,011,948	195,481,948	203,261,948	283,813,255						
Total Coverage	406,203,008	180,826,948	188,011,948	195,481,948	203,261,948	283,813,255	0	0	0	0	0	
	1.50 x	2.75 x	2.75 x	2.75 x	2.76 x	2.44 x	n/a	n/a	n/a	n/a	n/a	
Loan Payments on TIFIA Loan - Phase 1	0	0	0	0	0	0	0	0	0	0	0	
Loan Payments on TIFIA Loan - Phase 2	33,127,570	34,442,395	35,811,100	0	0	0	0	0	0	0	0	
Total	33,127,570	34,442,395	35,811,100	0	0	0	0	0	0	0	0	
Combined Bond Debt Service/TIFIA Loan Combined Coverage	439,330,578	215,269,343	223,823,048	195,481,948	203,261,948	283,813,255	0	0	0	0	0	
	1.39 x	2.31 x	2.31 x	2.75 x	2.76 x	2.44 x	n/a	n/a	n/a	n/a	n/a	
Excess Revenues	169,981,109.27	281,435,495.65	293,228,393.53	342,749,282.72	357,016,190.43	408,110,117.18	602,768,144.17	624,368,485.97	646,739,058.94	669,907,234.20	693,901,353.22	

EXHIBIT 9

**STAR Solutions I-81 Detailed Proposal**  
**Heavy Commercial Vehicles Only**  
**Project Financing**

*Debt Service Coverage - Series 2012*

Year Ended Calendar Year	1/1/2005 2004	1/1/2006 2005	1/1/2007 2006	1/1/2008 2007	1/1/2009 2008	1/1/2010 2009	1/1/2011 2010	1/1/2012 2011	1/1/2013 2012	1/1/2014 2013
Toll Revenues (HV) - Early Systemwide	0	0	0	39,499,101	98,807,209	139,151,092	138,812,732	138,507,787	121,241,519	127,764,198
Toll Revenues (HV) - Phase 1	0	0	0	0	0	39,805,901	56,174,504	59,293,025	62,584,670	66,059,051
Toll Revenues (HV) - Phase 2	0	0	0	0	0	0	0	15,453,730	65,235,806	68,846,006
Toll Revenues (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
DSRF Earnings - Phase 1	0	0	0	0	0	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	0	0	0	0	0	0	0	2,173,918	4,347,836	4,347,836
DSRF Earnings - Phase 3	0	0	0	0	0	0	0	0	0	0
	0	0	0	39,499,101	98,807,209	184,039,796	200,070,039	220,511,262	258,492,634	272,099,894
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
Net Revenues	0	0	0	27,596,687	86,607,234	171,534,822	187,252,440	207,373,224	245,026,145	258,296,742
Debt Service on Toll Revenue Bonds - Phase 1	0	0	0	0	0	37,253,411	124,831,215	126,496,215	116,961,215	123,401,215
Debt Service on Toll Revenue Bonds - Phase 2	0	0	0	0	0	0	0	6,816,737	46,386,948	48,791,948
Debt Service on Toll Revenue Bonds - Phase 3	0	0	0	0	0	0	0	0	0	0
Total Coverage	0 n/a	0 n/a	0 n/a	0 n/a	0 n/a	37,253,411 4.60 x	124,831,215 1.50 x	133,312,952 1.56 x	163,348,163 1.50 x	172,193,163 1.50 x
Loan Payments on TIFIA Loan - Phase 1	0	0	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 2	0	0	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 3	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Combined Bond Debt Service/TIFIA Loan Combined Coverage	0 n/a	0 n/a	0 n/a	0 n/a	0 n/a	37,253,411 4.60 x	124,831,215 1.50 x	133,312,952 1.56 x	163,348,163 1.50 x	172,193,163 1.50 x
Excess Revenues	-	-	-	27,596,686.91	86,607,234.12	134,281,410.37	62,421,225.21	74,060,271.88	81,677,982.28	86,103,579.98

EXHIBIT 9

**STAR Solutions I-81 Detailed Proposal**  
**Heavy Commercial Vehicles Only**  
**Project Financing**

*Debt Service Coverage - Series 2012*

Year Ended Calendar Year	1/1/2015 2014	1/1/2016 2015	1/1/2017 2016	1/1/2018 2017	1/1/2019 2018	1/1/2020 2019	1/1/2021 2020	1/1/2022 2021	1/1/2023 2022	1/1/2024 2023
Toll Revenues (HV) - Early Systemwide	134,637,841	99,608,126	60,374,962	63,576,199	66,947,174	16,067,789	0	0	0	0
Toll Revenues (HV) - Phase 1	69,726,311	73,597,159	77,457,536	81,520,400	85,796,373	82,322,344	86,219,797	90,142,797	94,244,295	98,532,410
Toll Revenues (HV) - Phase 2	72,655,996	76,676,833	80,717,352	84,970,785	89,448,352	85,846,229	89,931,234	94,023,105	98,301,157	102,773,859
Toll Revenues (HV) - Phase 3	0	75,166,479	158,095,344	166,258,471	174,843,023	167,632,736	175,432,338	183,414,509	191,759,869	200,484,943
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836
DSRF Earnings - Phase 3	0	4,432,690	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380
	286,450,788	338,911,926	394,941,213	414,621,874	435,330,941	370,165,116	369,879,387	385,876,430	402,601,339	420,087,231
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	14,148,230	14,501,936	14,864,485	15,236,097	15,616,999	16,007,424	16,407,610	16,817,800	17,238,245	17,669,201
	14,148,230	14,501,936	14,864,485	15,236,097	15,616,999	16,007,424	16,407,610	16,817,800	17,238,245	17,669,201
Net Revenues	272,302,558	324,409,990	380,076,728	399,385,777	419,713,942	354,157,692	353,471,777	369,058,630	385,363,094	402,418,030
Debt Service on Toll Revenue Bonds - Phase 1	130,196,215	109,186,215	85,366,215	89,961,215	94,806,215	58,306,215	49,926,215	52,271,215	54,721,215	57,296,215
Debt Service on Toll Revenue Bonds - Phase 2	51,331,948	54,011,948	56,706,948	59,541,948	62,526,948	60,126,948	62,851,948	65,576,948	68,431,948	71,411,948
Debt Service on Toll Revenue Bonds - Phase 3	0	40,249,760	111,304,520	116,744,520	122,469,520	117,664,520	122,864,520	128,184,520	133,749,520	139,564,520
Total Coverage	181,528,163 1.50 x	203,447,923 1.59 x	253,377,683 1.50 x	266,247,683 1.50 x	279,802,683 1.50 x	236,097,683 1.50 x	235,642,683 1.50 x	246,032,683 1.50 x	256,902,683 1.50 x	268,272,683 1.50 x
Loan Payments on TIFIA Loan - Phase 1	28,578,780	23,967,995	18,737,645	19,745,895	20,807,740	15,311,340	15,311,340	15,311,340	15,311,340	15,311,340
Loan Payments on TIFIA Loan - Phase 2	0	0	0	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520
Loan Payments on TIFIA Loan - Phase 3	0	0	0	0	0	0	0	39,242,590	39,242,590	39,242,590
Total	28,578,780	23,967,995	18,737,645	37,843,415	38,905,260	33,408,860	33,408,860	72,651,450	72,651,450	72,651,450
Combined Bond Debt Service/TIFIA Loan Combined Coverage	210,106,943 1.30 x	227,415,918 1.43 x	272,115,328 1.40 x	304,091,098 1.31 x	318,707,943 1.32 x	269,506,543 1.31 x	269,051,543 1.31 x	318,684,133 1.16 x	329,554,133 1.17 x	340,924,133 1.18 x
Excess Revenues	62,195,615.01	96,994,072.77	107,961,400.59	95,294,679.32	101,005,999.52	84,651,149.38	84,420,234.86	50,374,497.88	55,808,961.61	61,493,897.57

EXHIBIT 9

**STAR Solutions I-81 Detailed Proposal**  
**Heavy Commercial Vehicles Only**  
**Project Financing**

*Debt Service Coverage - Series 2012*

Year Ended Calendar Year	1/1/2025 2024	1/1/2026 2025	1/1/2027 2026	1/1/2028 2027	1/1/2029 2028	1/1/2030 2029	1/1/2031 2030	1/1/2032 2031	1/1/2033 2032	1/1/2034 2033
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase 1	103,015,635	107,702,846	112,603,325	117,726,777	123,083,345	128,683,637	134,538,743	140,660,256	147,060,297	153,751,541
Toll Revenues (HV) - Phase 2	107,450,070	112,339,048	117,450,475	122,794,471	128,381,620	134,222,983	140,330,129	146,715,150	153,390,689	160,369,966
Toll Revenues (HV) - Phase 3	209,607,008	219,144,127	229,115,185	239,539,926	250,438,992	261,833,967	273,747,412	286,202,919	299,225,152	312,839,897
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836
DSRF Earnings - Phase 3	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380
	438,368,731	457,482,040	477,465,004	498,357,193	520,199,976	543,036,606	566,912,303	591,874,344	617,972,157	645,257,422
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071
	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071
Net Revenues	420,257,800	438,918,335	458,437,207	478,853,701	500,208,897	522,545,750	545,909,175	570,346,138	595,905,746	622,639,351
Debt Service on Toll Revenue Bonds - Phase 1	59,991,215	62,811,215	65,771,215	68,866,215	72,116,215	75,516,215	79,076,215	82,806,215	86,716,215	90,806,215
Debt Service on Toll Revenue Bonds - Phase 2	74,526,948	77,786,948	81,196,948	84,756,948	88,481,948	92,376,948	96,451,948	100,706,948	105,156,948	109,806,948
Debt Service on Toll Revenue Bonds - Phase 3	145,644,520	152,004,520	158,649,520	165,599,520	172,869,520	180,464,520	188,404,520	196,709,520	205,389,520	214,469,520
Total Coverage	280,162,683 1.50 x	292,602,683 1.50 x	305,617,683 1.50 x	319,222,683 1.50 x	333,467,683 1.50 x	348,357,683 1.50 x	363,932,683 1.50 x	380,222,683 1.50 x	397,262,683 1.50 x	415,082,683 1.50 x
Loan Payments on TIFIA Loan - Phase 1	15,311,340	15,311,340	15,311,340	15,311,340	15,826,340	16,576,985	17,358,170	18,180,620	19,034,205	19,934,080
Loan Payments on TIFIA Loan - Phase 2	18,097,520	18,647,520	19,459,795	20,316,793	21,207,860	22,142,643	23,114,893	24,138,363	25,200,615	26,319,510
Loan Payments on TIFIA Loan - Phase 3	39,242,590	39,242,590	39,667,590	41,401,240	43,215,770	45,114,400	47,104,420	49,176,880	51,352,520	53,614,910
Total	72,651,450	73,201,450	74,438,725	77,029,373	80,249,970	83,834,028	87,577,483	91,495,863	95,587,340	99,868,500
Combined Bond Debt Service/TIFIA Loan Combined Coverage	352,814,133 1.19 x	365,804,133 1.20 x	380,056,408 1.21 x	396,252,055 1.21 x	413,717,653 1.21 x	432,191,710 1.21 x	451,510,165 1.21 x	471,718,545 1.21 x	492,850,023 1.21 x	514,951,183 1.21 x
Excess Revenues	67,443,667.71	73,114,202.85	78,380,799.20	82,601,645.60	86,491,244.21	90,354,039.78	94,399,010.10	98,627,592.83	103,055,723.98	107,688,168.01

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing										
EXHIBIT 9										
Debt Service Coverage - Series 2012										
Year Ended Calendar Year	1/1/2035 2034	1/1/2036 2035	1/1/2037 2036	1/1/2038 2037	1/1/2039 2038	1/1/2040 2039	1/1/2041 2040	1/1/2042 2041	1/1/2043 2042	1/1/2044 2043
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase 1	160,747,236	168,061,235	175,708,021	183,702,736	192,061,211	200,799,996	209,936,396	218,412,578	227,230,986	236,405,437
Toll Revenues (HV) - Phase 2	167,666,799	175,295,638	183,271,590	191,610,447	200,328,723	209,443,680	218,973,367	227,814,417	237,012,424	246,581,800
Toll Revenues (HV) - Phase 3	327,074,112	341,955,984	357,514,981	373,781,913	390,788,990	408,569,889	427,159,819	444,406,397	462,349,305	481,016,658
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836
DSRF Earnings - Phase 3	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380
	673,784,166	703,608,876	734,790,611	767,391,115	801,474,942	837,109,583	874,365,600	908,929,410	944,888,733	982,299,914
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043
	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043
Net Revenues	650,600,643	679,845,765	710,433,422	742,424,997	775,884,671	810,879,555	847,479,821	881,371,486	916,641,861	953,346,870
Debt Service on Toll Revenue Bonds - Phase 1	95,096,215	99,586,215	104,286,215	109,211,215	114,368,355	119,763,965	125,418,795	130,624,760	136,042,715	141,688,985
Debt Service on Toll Revenue Bonds - Phase 2	114,671,948	119,761,948	125,076,948	130,636,948	136,446,948	142,526,948	148,876,948	154,771,948	160,901,948	167,281,948
Debt Service on Toll Revenue Bonds - Phase 3	223,959,520	233,879,520	244,249,520	255,094,520	266,434,520	278,289,520	290,679,520	302,179,520	314,139,520	326,584,520
Total Coverage	433,727,683 1.50 x	453,227,683 1.50 x	473,612,683 1.50 x	494,942,683 1.50 x	517,249,823 1.50 x	540,580,433 1.50 x	564,975,263 1.50 x	587,576,228 1.50 x	611,084,183 1.50 x	635,555,453 1.50 x
Loan Payments on TIFIA Loan - Phase 1	27,874,260	29,189,760	30,566,415	32,008,965	33,521,295	35,106,435	36,761,560	38,283,275	39,874,015	41,529,530
Loan Payments on TIFIA Loan - Phase 2	27,486,420	28,702,718	29,979,180	24,880,395	25,993,238	27,147,790	28,360,128	29,479,838	30,649,838	31,864,418
Loan Payments on TIFIA Loan - Phase 3	55,987,620	58,466,740	61,062,430	63,777,990	66,610,170	69,569,480	72,674,260	38,625,060	40,153,170	41,746,980
Total	111,348,300	116,359,218	121,608,025	120,667,350	126,124,703	131,823,705	137,795,948	106,388,173	110,677,023	115,140,928
Combined Bond Debt Service/TIFIA Loan Combined Coverage	545,075,983 1.19 x	569,586,900 1.19 x	595,220,708 1.19 x	615,610,033 1.21 x	643,374,525 1.21 x	672,404,138 1.21 x	702,771,210 1.21 x	693,964,400 1.27 x	721,761,205 1.27 x	750,696,380 1.27 x
Excess Revenues	105,524,660.07	110,258,865.18	115,212,714.93	126,814,964.17	132,510,145.60	138,475,417.33	144,708,611.30	187,407,086.18	194,880,656.26	202,650,490.30

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing											
EXHIBIT 9											
Debt Service Coverage - Series 2012											
Year Ended Calendar Year	1/1/2045 2044	1/1/2046 2045	1/1/2047 2046	1/1/2048 2047	1/1/2049 2048	1/1/2050 2049	1/1/2051 2050	1/1/2052 2051	1/1/2053 2052	1/1/2054 2053	1/1/2055 2054
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase 1	245,950,306	255,880,550	266,211,727	276,960,025	288,142,286	299,776,031	311,879,488	322,873,240	334,254,522	346,036,994	358,234,798
Toll Revenues (HV) - Phase 2	256,537,541	266,895,244	277,671,139	288,882,111	300,545,727	312,680,260	325,304,726	336,771,717	348,642,921	360,932,583	373,655,457
Toll Revenues (HV) - Phase 3	500,437,706	520,642,878	541,663,834	563,533,512	586,286,177	609,957,481	634,584,515	656,953,619	680,111,234	704,085,155	728,904,157
DSRF Earnings - Phase 1	132,152,874										
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	113,043,734					
DSRF Earnings - Phase 3	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	230,499,877			
	1,148,291,642	1,056,631,887	1,098,759,916	1,142,588,864	1,188,187,406	1,344,322,887	1,280,634,109	1,547,098,454	1,363,008,677	1,411,054,733	1,460,794,412
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	29,676,869	30,418,791	31,179,261	31,958,742	32,757,711	33,576,654	34,416,070	35,276,472	36,158,384	37,062,343	37,988,902
	29,676,869	30,418,791	31,179,261	31,958,742	32,757,711	33,576,654	34,416,070	35,276,472	36,158,384	37,062,343	37,988,902
Net Revenues	1,118,614,772	1,026,213,096	1,067,580,655	1,110,630,122	1,155,429,695	1,310,746,234	1,246,218,039	1,511,821,982	1,326,850,293	1,373,992,389	1,422,805,510
Debt Service on Toll Revenue Bonds - Phase 1	232,281,060	0	0	0	0	0	0	0	0	0	0
Debt Service on Toll Revenue Bonds - Phase 2	173,921,948	180,826,948	188,011,948	195,481,948	203,261,948	283,813,255					
Debt Service on Toll Revenue Bonds - Phase 3	339,534,520	353,004,520	367,014,520	381,594,520	396,764,520	412,544,520	428,963,640	591,631,880			
Total Coverage	745,737,528 1.50 x	533,831,468 1.92 x	555,026,468 1.92 x	577,076,468 1.92 x	600,026,468 1.93 x	696,357,775 1.88 x	428,963,640 2.91 x	591,631,880 2.56 x	0 n/a	0 n/a	0 n/a
Loan Payments on TIFIA Loan - Phase 1	0	0	0	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 2	33,127,570	34,442,395	35,811,100	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 3	43,397,230	45,119,350	46,911,910	48,777,550	50,712,670	52,732,740	54,831,060	0	0	0	0
Total	76,524,800	79,561,745	82,723,010	48,777,550	50,712,670	52,732,740	54,831,060	0	0	0	0
Combined Bond Debt Service/TIFIA Loan Combined Coverage	822,262,328 1.36 x	613,393,213 1.67 x	637,749,478 1.67 x	625,854,018 1.77 x	650,739,138 1.78 x	749,090,515 1.75 x	483,794,700 2.58 x	591,631,880 2.56 x	0 n/a	0 n/a	0 n/a
Excess Revenues	296,352,444.84	412,819,883.58	429,831,177.66	484,776,104.16	504,690,557.40	561,655,718.55	762,423,338.85	920,190,102.14	1,326,850,292.94	1,373,992,389.00	1,422,805,510.00

STAR Solutions I-81 Detailed Proposal										
Heavy Commercial Vehicles Only										
Project Financing										
<i>Debt Service Coverage - Series 2015</i>										
Year Ended	1/1/2005	1/1/2006	1/1/2007	1/1/2008	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013	1/1/2014
Calendar Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Toll Revenues (HV) - Early Systemwide	0	0	0	39,499,101	98,807,209	139,151,092	138,812,732	138,507,787	121,241,519	127,764,198
Toll Revenues (HV) - Phase 1	0	0	0	0	0	39,805,901	56,174,504	59,293,025	62,584,670	66,059,051
Toll Revenues (HV) - Phase 2	0	0	0	0	0	0	0	15,453,730	65,235,806	68,846,006
Toll Revenues (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
Toll Revenues (HV) - Phase 4	0	0	0	0	0	0	0	0	0	0
DSRF Earnings - Phase 1	0	0	0	0	0	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	0	0	0	0	0	0	0	2,173,918	4,347,836	4,347,836
DSRF Earnings - Phase 3	0	0	0	0	0	0	0	0	0	0
DSRF Earnings - Phase 4	0	0	0	0	0	0	0	0	0	0
	0	0	0	39,499,101	98,807,209	184,039,796	200,070,039	220,511,262	258,492,634	272,099,894
Net Revenues										
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 4	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
	0	0	0	11,902,414	12,199,975	12,504,974	12,817,598	13,138,038	13,466,489	13,803,152
Net Revenues	0	0	0	27,596,687	86,607,234	171,534,822	187,252,440	207,373,224	245,026,145	258,296,742
Debt Service on Toll Revenue Bonds - Phase 1	0	0	0	0	0	37,253,411	124,831,215	126,496,215	116,961,215	123,401,215
Debt Service on Toll Revenue Bonds - Phase 2	0	0	0	0	0	0	0	6,816,737	46,386,948	48,791,948
Debt Service on Toll Revenue Bonds - Phase 3	0	0	0	0	0	0	0	0	0	0
Debt Service on Toll Revenue Bonds - Phase 4	0	0	0	0	0	0	0	0	0	0
Total Coverage	0	0	0	0	0	37,253,411	124,831,215	133,312,952	163,348,163	172,193,163
	n/a	n/a	n/a	n/a	n/a	4.60 x	1.50 x	1.56 x	1.50 x	1.50 x
Loan Payments on TIFIA Loan - Phase 1	0	0	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 2	0	0	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 3	0	0	0	0	0	0	0	0	0	0
Loan Payments on TIFIA Loan - Phase 4	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Combined Bond Debt Service/TIFIA Loan Combined Coverage	0	0	0	0	0	37,253,411	124,831,215	133,312,952	163,348,163	172,193,163
	n/a	n/a	n/a	n/a	n/a	4.60 x	1.50 x	1.56 x	1.50 x	1.50 x
Excess Revenues	0	0	0	27,596,687	86,607,234	134,281,410	62,421,225	74,060,272	81,677,982	86,103,580

EXHIBIT 10

**STAR Solutions I-81 Detailed Proposal**  
**Heavy Commercial Vehicles Only**  
**Project Financing**

*Debt Service Coverage - Series 2015*

Year Ended Calendar Year	1/1/2015 2014	1/1/2016 2015	1/1/2017 2016	1/1/2018 2017	1/1/2019 2018	1/1/2020 2019	1/1/2021 2020	1/1/2022 2021	1/1/2023 2022	1/1/2024 2023
Toll Revenues (HV) - Early Systemwide	134,637,841	99,608,126	60,374,962	63,576,199	66,947,174	16,067,789	0	0	0	0
Toll Revenues (HV) - Phase 1	69,726,311	73,597,159	77,457,536	81,520,400	85,796,373	82,322,344	86,219,797	90,142,797	94,244,295	98,532,410
Toll Revenues (HV) - Phase 2	72,655,996	76,676,833	80,717,352	84,970,785	89,448,352	85,846,229	89,931,234	94,023,105	98,301,157	102,773,859
Toll Revenues (HV) - Phase 3	0	75,166,479	158,095,344	166,258,471	174,843,023	167,632,736	175,432,338	183,414,509	191,759,869	200,484,943
Toll Revenues (HV) - Phase 4	0	0	0	0	0	71,801,685	100,340,025	104,905,496	109,678,697	114,669,077
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836
DSRF Earnings - Phase 3	0	4,432,690	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380
DSRF Earnings - Phase 4	0	0	0	0	0	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943
	286,450,788	338,911,926	394,941,213	414,621,874	435,330,941	447,396,744	475,649,356	496,211,870	517,709,979	540,186,252
Net Revenues										
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0
Toll Collection Costs (HV) - Phase 4	0	0	0	0	0	0	0	0	0	0
Fixed O&M Costs	14,148,230	14,501,936	14,864,485	15,236,097	15,616,999	16,007,424	16,407,610	16,817,800	17,238,245	17,669,201
	14,148,230	14,501,936	14,864,485	15,236,097	15,616,999	16,007,424	16,407,610	16,817,800	17,238,245	17,669,201
Net Revenues	272,302,558	324,409,990	380,076,728	399,385,777	419,713,942	431,389,320	459,241,746	479,394,070	500,471,734	522,517,051
Debt Service on Toll Revenue Bonds - Phase 1	130,196,215	109,186,215	85,366,215	89,961,215	94,806,215	58,306,215	49,926,215	52,271,215	54,721,215	57,296,215
Debt Service on Toll Revenue Bonds - Phase 2	51,331,948	54,011,948	56,706,948	59,541,948	62,526,948	60,126,948	62,851,948	65,576,948	68,431,948	71,411,948
Debt Service on Toll Revenue Bonds - Phase 3	0	40,249,760	111,304,520	116,744,520	122,469,520	117,664,520	122,864,520	128,184,520	133,749,520	139,564,520
Debt Service on Toll Revenue Bonds- Phase 4	0	0	0	0	0	39,524,691	70,509,588	73,554,588	76,734,588	80,064,588
Total Coverage	181,528,163 1.50 x	203,447,923 1.59 x	253,377,683 1.50 x	266,247,683 1.50 x	279,802,683 1.50 x	275,622,373 1.57 x	306,152,270 1.50 x	319,587,270 1.50 x	333,637,270 1.50 x	348,337,270 1.50 x
Loan Payments on TIFIA Loan - Phase 1	28,578,780	23,967,995	18,737,645	19,745,895	20,807,740	15,311,340	15,311,340	15,311,340	15,311,340	15,311,340
Loan Payments on TIFIA Loan - Phase 2	0	0	0	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520	18,097,520
Loan Payments on TIFIA Loan - Phase 3	0	0	0	0	0	0	39,242,590	39,242,590	39,242,590	39,242,590
Loan Payments on TIFIA Loan - Phase 4	0	0	0	0	0	0	0	0	0	0
Total	28,578,780	23,967,995	18,737,645	37,843,415	38,905,260	33,408,860	33,408,860	72,651,450	72,651,450	72,651,450
Combined Bond Debt Service/TIFIA Loan Combined Coverage	210,106,943 1.30 x	227,415,918 1.43 x	272,115,328 1.40 x	304,091,098 1.31 x	318,707,943 1.32 x	309,031,233 1.40 x	339,561,130 1.35 x	392,238,720 1.22 x	406,288,720 1.23 x	420,988,720 1.24 x
Excess Revenues	62,195,615	96,994,073	107,961,401	95,294,679	101,006,000	122,358,087	119,680,616	87,155,350	94,183,014	101,528,331

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing											EXHIBIT 10
Debt Service Coverage - Series 2015											
Year Ended Calendar Year	1/1/2025 2024	1/1/2026 2025	1/1/2027 2026	1/1/2028 2027	1/1/2029 2028	1/1/2030 2029	1/1/2031 2030	1/1/2032 2031	1/1/2033 2032	1/1/2034 2033	
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	
Toll Revenues (HV) - Phase 1	103,015,635	107,702,846	112,603,325	117,726,777	123,083,345	128,683,637	134,538,743	140,660,256	147,060,297	153,751,541	
Toll Revenues (HV) - Phase 2	107,450,070	112,339,048	117,450,475	122,794,471	128,381,620	134,222,983	140,330,129	146,715,150	153,390,689	160,369,966	
Toll Revenues (HV) - Phase 3	209,607,008	219,144,127	229,115,185	239,539,926	250,438,992	261,833,967	273,747,412	286,202,919	299,225,152	312,839,897	
Toll Revenues (HV) - Phase 4	119,886,520	125,341,357	131,044,389	137,006,908	143,240,723	149,758,176	156,572,173	163,696,206	171,144,384	178,931,453	
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	
DSRF Earnings - Phase 3	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	
DSRF Earnings - Phase 4	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	
	563,685,195	588,253,340	613,939,336	640,794,044	668,870,642	698,224,725	728,914,418	761,000,493	794,546,484	829,618,818	
Net Revenues											
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 4	0	0	0	0	0	0	0	0	0	0	
Fixed O&M Costs	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071	
	18,110,931	18,563,704	19,027,797	19,503,492	19,991,079	20,490,856	21,003,128	21,528,206	22,066,411	22,618,071	
Net Revenues	545,574,264	569,689,636	594,911,539	621,290,552	648,879,563	677,733,869	707,911,291	739,472,287	772,480,074	807,000,747	
Debt Service on Toll Revenue Bonds - Phase 1	59,991,215	62,811,215	65,771,215	68,866,215	72,116,215	75,516,215	79,076,215	82,806,215	86,716,215	90,806,215	
Debt Service on Toll Revenue Bonds - Phase 2	74,526,948	77,786,948	81,196,948	84,756,948	88,481,948	92,376,948	96,451,948	100,706,948	105,156,948	109,806,948	
Debt Service on Toll Revenue Bonds - Phase 3	145,644,520	152,004,520	158,649,520	165,599,520	172,869,520	180,464,520	188,404,520	196,709,520	205,389,520	214,469,520	
Debt Service on Toll Revenue Bonds- Phase 4	83,539,588	87,179,588	90,979,588	94,954,588	99,109,588	103,454,588	107,999,588	112,749,588	117,714,588	122,904,588	
Total Coverage	363,702,270 1.50 x	379,782,270 1.50 x	396,597,270 1.50 x	414,177,270 1.50 x	432,577,270 1.50 x	451,812,270 1.50 x	471,932,270 1.50 x	492,972,270 1.50 x	514,977,270 1.50 x	537,987,270 1.50 x	
Loan Payments on TIFIA Loan - Phase 1	15,311,340	15,311,340	15,311,340	15,311,340	15,826,340	16,576,985	17,358,170	18,180,620	19,034,205	19,934,080	
Loan Payments on TIFIA Loan - Phase 2	18,097,520	18,647,520	19,459,795	20,316,793	21,207,860	22,142,643	23,114,893	24,138,363	25,200,615	26,319,510	
Loan Payments on TIFIA Loan - Phase 3	39,242,590	39,242,590	39,667,590	41,401,240	43,215,770	45,114,400	47,104,420	49,176,880	51,352,520	53,614,910	
Loan Payments on TIFIA Loan - Phase 4	25,692,930	25,692,930	25,692,930	25,692,930	25,692,930	25,867,930	27,001,643	28,186,503	29,429,448	30,726,448	
Total	98,344,380	98,894,380	100,131,655	102,722,303	105,942,900	109,701,958	114,579,125	119,682,365	125,016,788	130,594,948	
Combined Bond Debt Service/TIFIA Loan Combined Coverage	462,046,650 1.18 x	478,676,650 1.19 x	496,728,925 1.20 x	516,899,573 1.20 x	538,520,170 1.20 x	561,514,228 1.21 x	586,511,395 1.21 x	612,654,635 1.21 x	639,994,058 1.21 x	668,582,218 1.21 x	
Excess Revenues	83,527,614	91,012,986	98,182,614	104,390,980	110,359,393	116,219,641	121,399,896	126,817,652	132,486,016	138,418,530	

STAR Solutions I-81 Detailed Proposa											EXHIBIT 10
Heavy Commercial Vehicles Only											
Project Financing											
Debt Service Coverage - Series 2015											
Year Ended	1/1/2035	1/1/2036	1/1/2037	1/1/2038	1/1/2039	1/1/2040	1/1/2041	1/1/2042	1/1/2043	1/1/2044	
Calendar Year	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	
Toll Revenues (HV) - Phase 1	160,747,236	168,061,235	175,708,021	183,702,736	192,061,211	200,799,996	209,936,396	218,412,578	227,230,986	236,405,437	
Toll Revenues (HV) - Phase 2	167,666,799	175,295,638	183,271,590	191,610,447	200,328,723	209,443,680	218,973,367	227,814,417	237,012,424	246,581,800	
Toll Revenues (HV) - Phase 3	327,074,112	341,955,984	357,514,981	373,781,913	390,788,990	408,569,889	427,159,819	444,406,397	462,349,305	481,016,658	
Toll Revenues (HV) - Phase 4	187,072,834	195,584,648	204,483,750	213,787,760	223,515,104	233,685,041	244,317,710	254,182,038	264,444,637	275,121,590	
DSRF Earnings - Phase 1	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	5,082,803	
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	
DSRF Earnings - Phase 3	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	
DSRF Earnings - Phase 4	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	
	866,286,943	904,623,468	944,704,304	986,608,819	1,030,419,989	1,076,224,567	1,124,113,254	1,168,541,391	1,214,763,314	1,262,851,447	
Net Revenues											
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 4	0	0	0	0	0	0	0	0	0	0	
Fixed O&M Costs	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043	
	23,183,523	23,763,111	24,357,189	24,966,119	25,590,272	26,230,028	26,885,779	27,557,923	28,246,872	28,953,043	
Net Revenues	843,103,420	880,860,357	920,347,116	961,642,700	1,004,829,717	1,049,994,539	1,097,227,475	1,140,983,467	1,186,516,442	1,233,898,403	
Debt Service on Toll Revenue Bonds - Phase 1	95,096,215	99,586,215	104,286,215	109,211,215	114,368,355	119,763,965	125,418,795	130,624,760	136,042,715	141,688,985	
Debt Service on Toll Revenue Bonds - Phase 2	114,671,948	119,761,948	125,076,948	130,636,948	136,446,948	142,526,948	148,876,948	154,771,948	160,901,948	167,281,948	
Debt Service on Toll Revenue Bonds - Phase 3	223,959,520	233,879,520	244,249,520	255,094,520	266,434,520	278,289,520	290,679,520	302,179,520	314,139,520	326,584,520	
Debt Service on Toll Revenue Bonds- Phase 4	128,334,588	134,009,588	139,939,588	146,144,588	152,629,588	159,409,588	166,494,588	173,074,588	179,914,588	187,029,588	
Total Coverage	562,062,270 1.50 x	587,237,270 1.50 x	613,552,270 1.50 x	641,087,270 1.50 x	669,879,410 1.50 x	699,990,020 1.50 x	731,469,850 1.50 x	760,650,815 1.50 x	790,998,770 1.50 x	822,585,040 1.50 x	
Loan Payments on TIFIA Loan - Phase 1	27,874,260	29,189,760	30,566,415	32,008,965	33,521,295	35,106,435	36,761,560	38,283,275	39,874,015	41,529,530	
Loan Payments on TIFIA Loan - Phase 2	27,486,420	28,702,718	29,979,180	24,880,395	25,993,238	27,147,790	28,360,128	29,479,838	30,649,838	31,864,418	
Loan Payments on TIFIA Loan - Phase 3	55,987,620	58,466,740	61,062,430	63,777,990	66,610,170	69,569,480	72,674,260	76,025,060	80,153,170	84,746,980	
Loan Payments on TIFIA Loan - Phase 4	32,083,150	33,499,235	34,983,738	36,534,403	38,153,330	39,851,653	41,623,890	43,263,918	44,977,865	46,811,245	
Total	143,431,450	149,858,453	156,591,763	157,201,753	164,278,033	171,675,358	179,419,838	149,652,090	155,654,888	140,649,245	
Combined Bond Debt Service/TIFIA Loan Combined Coverage	705,493,720 1.20 x	737,095,723 1.20 x	770,144,033 1.20 x	798,289,023 1.20 x	834,157,443 1.20 x	871,665,378 1.20 x	910,889,688 1.20 x	910,302,905 1.25 x	946,653,658 1.25 x	963,234,285 1.28 x	
Excess Revenues	137,609,700	143,764,634	150,203,083	163,353,678	170,672,275	178,329,161	186,337,787	230,680,562	239,862,784	270,664,118	

STAR Solutions I-81 Detailed Proposal Heavy Commercial Vehicles Only Project Financing												EXHIBIT 10
Debt Service Coverage - Series 2015												
Year Ended Calendar Year	1/1/2045 2044	1/1/2046 2045	1/1/2047 2046	1/1/2048 2047	1/1/2049 2048	1/1/2050 2049	1/1/2051 2050	1/1/2052 2051	1/1/2053 2052	1/1/2054 2053	1/1/2055 2054	
Toll Revenues (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0	
Toll Revenues (HV) - Phase 1	245,950,306	255,880,550	266,211,727	276,960,025	288,142,286	299,776,031	311,879,488	322,873,240	334,254,522	346,036,994	358,234,798	
Toll Revenues (HV) - Phase 2	256,537,541	266,895,244	277,671,139	288,882,111	300,545,727	312,680,260	325,304,726	336,771,717	348,642,921	360,932,583	373,655,457	
Toll Revenues (HV) - Phase 3	500,437,706	520,642,878	541,663,834	563,533,512	586,286,177	609,957,481	634,584,515	656,953,619	680,111,234	704,085,155	728,904,157	
Toll Revenues (HV) - Phase 4	286,229,624	297,786,145	309,809,261	322,317,809	335,331,391	348,870,396	362,956,038	375,750,238	388,995,434	402,707,523	416,902,964	
DSRF Earnings - Phase 1	132,152,874											
DSRF Earnings - Phase 2	4,347,836	4,347,836	4,347,836	4,347,836	4,347,836	113,043,734						
DSRF Earnings - Phase 3	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	8,865,380	230,499,877				
DSRF Earnings - Phase 4	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	5,429,943	141,178,525	
	1,439,951,209	1,359,847,975	1,413,999,120	1,470,336,617	1,528,948,740	1,698,623,227	1,649,020,090	1,928,278,636	1,757,434,054	1,819,192,199	2,018,875,900	
Net Revenues												
Toll Collection Costs (HV) - Early Systemwide	0	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 1	0	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 2	0	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 3	0	0	0	0	0	0	0	0	0	0	0	
Toll Collection Costs (HV) - Phase 4	0	0	0	0	0	0	0	0	0	0	0	
Fixed O&M Costs	29,676,869	30,418,791	31,179,261	31,958,742	32,757,711	33,576,654	34,416,070	35,276,472	36,158,384	37,062,343	37,988,902	
	29,676,869	30,418,791	31,179,261	31,958,742	32,757,711	33,576,654	34,416,070	35,276,472	36,158,384	37,062,343	37,988,902	
Net Revenues	1,410,274,339	1,329,429,184	1,382,819,859	1,438,377,874	1,496,191,029	1,665,046,573	1,614,604,020	1,893,002,164	1,721,275,671	1,782,129,856	1,980,886,998	
Debt Service on Toll Revenue Bonds - Phase 1	232,281,060	0	0	0	0	0	0	0	0	0	0	
Debt Service on Toll Revenue Bonds - Phase 2	173,921,948	180,826,948	188,011,948	195,481,948	203,261,948	283,813,255						
Debt Service on Toll Revenue Bonds - Phase 3	339,534,520	353,004,520	367,014,520	381,594,520	396,764,520	412,544,520	428,963,640	591,631,880				
Debt Service on Toll Revenue Bonds - Phase 4	194,439,588	202,139,588	210,154,588	218,494,588	227,169,588	236,199,588	245,589,588	254,119,588	262,949,588	272,087,963	372,053,858	
Total Coverage	940,177,115 1.50 x	735,971,055 1.81 x	765,181,055 1.81 x	795,571,055 1.81 x	827,196,055 1.81 x	932,557,363 1.79 x	674,553,228 2.39 x	845,751,468 2.24 x	262,949,588 6.55 x	272,087,963 6.55 x	372,053,858 5.32 x	
Loan Payments on TIFIA Loan - Phase 1	0	0	0	0	0	0	0	0	0	0	0	
Loan Payments on TIFIA Loan - Phase 2	33,127,570	34,442,395	35,811,100	0	0	0	0	0	0	0	0	
Loan Payments on TIFIA Loan - Phase 3	43,397,230	45,119,350	46,911,910	48,777,550	50,712,670	52,732,740	54,831,060	0	0	0	0	
Loan Payments on TIFIA Loan - Phase 4	26,512,840	27,564,325	28,662,775	29,797,548	30,978,000	32,207,200	33,487,248	34,649,275	35,854,413	37,103,148	0	
Total	103,037,640	107,126,070	111,385,785	78,575,098	81,690,670	84,939,940	88,318,308	34,649,275	35,854,413	37,103,148	0	
Combined Bond Debt Service/TIFIA Loan Combined Coverage	1,043,214,755 1.35 x	843,097,125 1.58 x	876,566,840 1.58 x	874,146,153 1.65 x	908,886,725 1.65 x	1,017,497,303 1.64 x	762,871,535 2.12 x	880,400,743 2.15 x	298,804,000 5.76 x	309,191,110 5.76 x	372,053,858 5.32 x	
Excess Revenues	367,059,584	486,332,059	506,253,019	564,231,722	587,304,304	647,549,270	851,732,485	1,012,601,421	1,422,471,671	1,472,938,746	1,608,833,141	

STAR Solutions I-81 Detailed Proposal		EXHIBIT 11					
Heavy Commercial Vehicles Only							
<i>Closed Barrier Forecast from WSA (HV)</i>							
Estimated Annual Toll Revenue by Project Phase							
Alternative Rate 3: \$0.10 - \$0.21 - Heavy Commercial Vehicle (1)							
Closed Electronic Toll Collection System							
Annual Toll Revenue Before Rate Increases (millions)							
Year		Total	Phase 0	Phase 1	Phase 2	Phase 3	Phase 4
2005							
2006		-	-	-	-	-	-
2007	(2)	32.1	32.1	-	-	-	-
2008		78.0	78.0	-	-	-	-
2009	(3)	137.2	106.6	30.5	-	-	-
2010		145.1	103.3	41.8	-	-	-
2011	(4)	154.1	100.1	42.8	11.2	-	-
2012		174.7	85.0	43.9	45.8	-	-
2013		178.9	87.0	45.0	46.9	-	-
2014		183.1	89.0	46.1	48.0	-	-
2015	(5)	208.6	63.9	47.2	49.2	48.2	-
2016		234.7	37.6	48.3	50.3	98.5	-
2017		239.8	38.5	49.3	51.4	100.6	-
2018		245.0	39.3	50.4	52.5	102.7	-
2019	(6)	265.0	10.1	51.5	53.7	104.9	44.9
2020		275.8	-	52.6	54.9	107.1	61.2
2021	(7)	281.3	-	53.7	56.0	109.2	62.5
2022		286.9	-	54.7	57.1	111.4	63.7
2023		292.7	-	55.8	58.2	113.6	65.0
2024		298.5	-	57.0	59.4	115.9	66.3
2025		304.5	-	58.1	60.6	118.2	67.6
2026		310.6	-	59.3	61.8	120.6	69.0
2027		316.8	-	60.4	63.0	123.0	70.3
2028		323.1	-	61.6	64.3	125.4	71.7
2029		329.6	-	62.9	65.6	127.9	73.2
2030		336.2	-	64.1	66.9	130.5	74.6
2031		342.9	-	65.4	68.2	133.1	76.1
2032		349.8	-	66.7	69.6	135.8	77.7
2033		356.8	-	68.1	71.0	138.5	79.2
2034		363.9	-	69.4	72.4	141.3	80.8
2035		371.2	-	70.8	73.9	144.1	82.4
2036		378.6	-	72.2	75.3	147.0	84.1
2037		386.2	-	73.7	76.8	149.9	85.7
2038		393.9	-	75.2	78.4	152.9	87.5
2039		401.8	-	76.7	80.0	156.0	89.2
2040		409.8	-	78.2	81.6	159.1	91.0
2041		416.0	-	79.4	82.8	161.5	92.4
2042		422.2	-	80.5	84.0	163.9	93.7
2043		428.5	-	81.8	85.3	166.4	95.1
2044		435.0	-	83.0	86.6	168.8	96.6
2045		441.5	-	84.2	87.9	171.4	98.0
2046		448.1	-	85.5	89.2	174.0	99.5
2047		454.8	-	86.8	90.5	176.6	101.0
2048		461.7	-	88.1	91.9	179.2	102.5
2049		468.6	-	89.4	93.2	181.9	104.0
2050		475.6	-	90.7	94.6	184.6	105.6
2051		480.4	-	91.6	95.6	186.5	106.7

2052	485.2	-	92.6	96.5	188.3	107.7
2053	490.0	-	93.5	97.5	190.2	108.8
2054	494.9	-	94.4	98.5	192.1	109.9

(1) Toll rates shown are per-mile rates for heavy commercial vehicles. The first rate shown represents the nominal toll rate levied along uncompleted express lane sections, while the second rate represents the rate levied along completed express lane sections.

(2) Tolling begins in each Phase as construction commences, but only at the rate for unimproved sections.

(3) Phase 1 from Lexington to Staunton, Mileposts 180 to 227, open to traffic on April 1, 2009.

(4) Phase 2, an additional 49 miles opens to traffic on October 1, 2011. Commercial vehicle express lanes open from Mileposts 156 to 252.

(5) Phase 3, an additional 122 miles opens to traffic on July 1, 2015. Commercial vehicle express lanes open from Mileposts 84 to 302.

(6) Phase 4, an additional 105 miles opens to traffic on April 1, 2019. Commercial vehicle express lanes open from Mileposts 0 to 323.

(7) All revenue estimates are grown by 2.0 percent per year from 2021 through 2040, by 1.5 percent per year from 2041 through 2050, and 1.0 percent per year from 2051 through 2060.

## Tab U Design and Construction Guarantees

***A detailed listing of all firms who will provide specific design, construction and completion guarantees and warranties. Include a brief description of the guarantees and warranties. Any guarantees, warranties or representations regarding quality of materials and assets must be clearly identified.***

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As the principal contractual entity of the STAR Solutions team, we propose that KBR maintain single-point responsibility for holding all contracts except the pavement warranty, which will be executed by Koch Performance Road, Inc. (KPRI). By doing this, we seek greater participation from local firms. This also provides STAR Solutions the maximum leverage to guarantee all work, schedules and costs associated with the project.

### **Design Guarantee**

STAR Solutions' team members KBR and Wilbur Smith Associates will be responsible for managing the design development of this project, with the design being accomplished by a large number of design firms. All of the firms accomplishing work on the I-81 improvement project will provide Professional Design Liability Insurance against any errors and omissions that may occur on their respective design sections, during performance of the project or applicable warranty period.

### **Construction and Completion Guarantee**

STAR Solutions anticipates that the Comprehensive Agreement will require KBR to accept design and construction responsibilities and that the price and completion date will be fixed at the financial closing. KBR will use its best efforts to supply a parent company guarantee to support this liability. In addition, for the construction phase of the project, KBR will provide, or cause to be provided, a payment and performance bond to support these guarantees naming VDOT as obligee.

We expect the terms of the design-build contract to be somewhat similar to the contract VDOT now has in place for the Route 895 Connector, including the toll road, its equipment and potential revenue. KBR's overall concept for the project is to provide VDOT with a completed product that meets the guidelines and specifications of the PPTA. KBR and its team have worldwide experience with design-build contracts and understand the appropriate risks to be borne by the parties and the expectations of their owners. With those principles in mind, KBR anticipates that the executed design-build contract would include the following terms:

- A scope that includes obtaining all permits and right-of-way on the behalf of VDOT as well as performing design and construction
- A fixed time for performances, some of which are started by the signing of the Comprehensive Agreement and some by the Financial Closing
- An Owner contingency for any changes in design and/or construction by the Owner. This allows VDOT to make changes without obtaining more funds
- Time and price adjustments for VDOT-directed changes



**A detailed listing of all firms who will provide specific design, construction and completion guarantees and warranties. Include a brief description of the guarantees and warranties. Any guarantees, warranties or representations regarding quality of materials and assets must be clearly identified.**

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- Limited liquidated damages if the project is not finished on time
- Five-year warranty on the performance of the work not otherwise covered by the pavement warranty provided by KPRI

KBR plans to subcontract most of the construction work to local and regional contractors. The applicable provisions in the design-build contract will be passed along to those subcontractors. We will also require a payment and performance bond from each of them as insurance to KBR that each one is qualified and competent.

Attached is a proposed form of guarantee for the obligations of KBR under the Comprehensive Agreement.

PARENT COMPANY GUARANTEE

This guarantee is given effective as of the \_\_\_\_ day of \_\_\_\_\_, 2004 by \_\_\_\_\_,  
a \_\_\_\_\_ corporation (the "Parent"), to \_\_\_\_\_ (the "Owner").

In consideration of the Owner entering into a contract with \_\_\_\_\_,  
a \_\_\_\_\_ corporation and a wholly-owned subsidiary of the Parent (the "Contractor") for

\_\_\_\_\_  
(the "Contract"), the Parent does hereby agree as follows:

1. If the Contractor shall in any respect fail to perform its obligations under the Contract or commits any breach thereof, the Parent, upon notice from the Owner, shall perform, or take whatever steps may be necessary to achieve performance of, the obligations of Contractor under such Contract.
2. The Owner shall have no obligation to proceed first against Contractor or against the surety on any bond before proceeding against the Parent on this guarantee.
3. This guarantee is the irrevocable, absolute and unconditional obligation of the Parent and shall not be affected by any waiver or forbearance granted to Contractor by the Owner.
4. This guarantee shall continue in full force and effect notwithstanding any alteration, addition, or amendment to, or deletion from, the Contract.
5. Notwithstanding any other provision to the contrary, (i) Parent shall have no greater liability hereunder than Contractor has under any contract with the Owner and (ii) Parent's aggregate liability under this guarantee shall in no event exceed \$\_\_\_\_\_.



***A detailed listing of all firms who will provide specific design, construction and completion guarantees and warranties. Include a brief description of the guarantees and warranties. Any guarantees, warranties or representations regarding quality of materials and assets must be clearly identified.***

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6. For purposes of this guarantee, notice may be given to the Parent at the following address:

Kellogg Brown & Root, Inc.  
and the Halliburton Company  
4100 Clinton Drive  
01-7th Floor  
Houston, TX 77020  
Attn: J.R. Taylor, Legal Dept.

The parent may change the address for notice by sending written notice to the Owner of the new address.

SIGNED at Houston, Texas as of the date first set forth above.

Kellogg Brown & Root, Inc.

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

### **Long-Term Pavement Warranty**

The ultimate assurance of quality is a guarantee of performance. KPRI will guarantee the performance of the project through a 20-year pavement warranty for all mainline, collector-distributor (CD) lanes, ramps and shoulders constructed as a result of this proposal. A warranty for the pavement will effectively transfer the financial risk of the pavement design, materials selection, construction and future pavement maintenance or repairs from VDOT to KPRI. KPRI's pavement warranty ensures that the pavement's performance will meet or exceed the warranty criteria for the life of the warranty. Fully integrating the engineering and construction processes provides a low-maintenance, high-quality pavement, which minimizes the life-cycle project cost to the taxpayer and VDOT while maintaining a superior pavement condition over the 20-year pavement warranty. KPRI will administer the pavement warranty program.

The pavement warranty criteria identifies the distresses, which affect the pavement performance during the life of the facility. KPRI proposes to provide pavement warranty criteria that address the performance, such as smoothness, rutting, raveling, cracking, delamination and potholes. If performance or condition of the roadway does not comply with the listed performance criteria individually, at any time during the warranty period, KPRI will provide the appropriate maintenance to the I-81 project to bring the road within the established quality thresholds.

***A detailed listing of all firms who will provide specific design, construction and completion guarantees and warranties. Include a brief description of the guarantees and warranties. Any guarantees, warranties or representations regarding quality of materials and assets must be clearly identified.***

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Since I-81 will be designed and constructed in phases, separate truck lanes will be constructed, and will vary with the amount of traffic throughout the corridor, VDOT and KPRI will need to agree on several warranty issues, including the warranty criteria for all the different portions of the roadway, the amount of inflation risk to be taken, the total amount of liability coverage and the amount of traffic usage.

To manage pavement performance during the warranty period, KPRI will measure pavement condition annually on the mainline pavement and ramps. Based on the routine reviews, annual in-depth inspections and the analysis of the data, KPRI will develop a maintenance strategy to keep the pavement in proper condition. Preventive maintenance procedures will be extensively used to not only reduce the costs, but also keep traffic interference to a minimum. The condition data will be compared to the pavement warranty criteria to determine pavement performance and compliance with the warranty criteria. If any of the warranty criteria is outside the agreed-upon limits, KPRI will repair the area so the warranty criteria are met.

KPRI will communicate with VDOT field facilities and offices about any activities, concerns, planning or problems during the warranty period. Once maintenance is planned, KPRI will coordinate the work with VDOT to avoid conflicting activities on the road and keep traffic interference to a minimum.

As part of this proposal, KPRI is making the assumptions that VDOT will collect the necessary traffic and weight data and that KPRI will calculate the annual Equivalent Single Axle Loads (ESAL). VDOT will provide KPRI access to all related I-81 information. If pavement repairs are necessary to prevent accidents, damage or injury to the public, VDOT may, at its discretion, carry out emergency pavement repairs in accordance with VDOT's statutory duties. KPRI will reimburse VDOT for costs to carry out emergency pavement repairs. KPRI will not assume any VDOT statutory duty to undertake emergency repairs or be named to any third-party claim as a result of the condition of the transportation corridor.

While long-term transportation infrastructure warranties are a relatively new approach, KPRI is willing to assume this responsibility to ensure that VDOT receives the best total value for their investment. This life-cycle approach will help VDOT in eliminating maintenance cost uncertainty and will have a positive effect on future VDOT maintenance budgets. As an option to further help with future maintenance budgets, KPRI would maintain the existing pavement to an agreed-upon service level for an agreed-upon price until the construction is started.

Figure U-1 shows the benefit VDOT and the people of the Commonwealth of Virginia will receive from STAR Solutions' proposal by comparing the construction and maintenance estimates for a standard VDOT design and the STAR Solutions' design and warranty. The 20-year comparison is for 316 miles of I-81 using a 30-year design with two truck lanes carrying approximately 77 percent of the trucks and two, three or four mixed traffic lanes with 23 percent trucks and their shoulders. The maintenance costs and KPRI's pavement warranty are shown below as present worth numbers using a discount rate of 3 percent.



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The maintenance costs for VDOT's estimate use their standard Life Cycle Cost Analysis procedure. All costs are rounded to the nearest thousand dollars. VDOT and the people of the Commonwealth of Virginia will receive the benefits of high quality and cost savings through the pavement warranty.

**Figure U-1: Construction and Maintenance Estimates**

	<b>Pavement Construction Costs</b>	<b>Pavement Maintenance Costs</b>	<b>Life Cycle Costs</b>
VDOT Standard Design	\$1,604,600,000	\$775,173,000	\$2,379,773,000
STAR Solutions Proposal	\$1,349,600,000	\$522,700,000	\$1,872,300,000

## Tab V Support and Opposition

***Any known government support or opposition, or general public support or opposition for the project. Government/public support should be demonstrated through resolutions of official bodies, minutes of meetings, letters, etc.***

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The I-81 corridor improvements project is widely anticipated throughout the state. Information detailing public opposition to and support for construction of the project was included in our Phase One Conceptual Proposal, including:

- A discussion of community benefits
- Existing governmental and community support
- STAR Solutions' public involvement plan

Since our initial submission, there have been additional indications of both governmental and public support for the I-81 project. We have incorporated this information into our original Tab 4–Public Support document. Please refer to the updated and revised Tab 4 of the Conceptual Proposal—which is being submitted with our Detailed Proposal—for the most recent indications of public support for this project.



Working with VDOT to Make I-81 Safer for Everyone