

USA

# I-495 Express Lanes



## OVERVIEW

### Location

Virginia, United States of America (USA)

### Sector

Transport – Roads

### Procuring Authority

Virginia Department of Transportation

### Project Company

Capital Beltway Express LLC

### Project Company Obligations

Design, Build, Finance, Operate and Maintain

### Financial Close

21 December 2007

### Capital Value

USD \$2.069 billion

### Contract Duration

80 years

### Key Events

Transition from contract signing to construction, and from construction to operations

## SUMMARY

The I-495 Express Lanes PPP (generally referred to in North America as P3) project consists of the construction of two additional high-occupancy toll (HOT) lanes per side along a 14-mile segment of the Interstate 495 highway (I-495) in the state of Virginia.

The I-495 is an interstate highway which surrounds Washington D.C. and is widely known as the “Capital Beltway”. The I-495 Express Lanes project, also known as the “E-ZPass Express Lanes”, consists of the expansion of a 14-mile segment of the I-495 extending from the Springfield Interchange to a point north of the Dulles Toll Road, in the state of Virginia. The project began when the Procuring Authority, the Virginia Department of Transportation (VDOT), signed an agreement with the Project Company, Capital Beltway Express LLC, in April 2005. However, financial close was not achieved until December 2007. The Project Company’s equity investors comprised of Fluor Corporation and Transurban at financial close.

A number of challenges arose during project delivery. By working collaboratively in a focused project office, committing appropriate resources to meet peak production periods, and working closely with the Project Company, these challenges were overcome and construction was completed ahead of schedule. The project opened early, on budget and with an industry-leading safety record.

## SUMMARY LESSONS LEARNED

- The level of Procuring Authority oversight must align with the risk profile of the PPP project. The Procuring Authority may also need to commit additional resources during peak production periods to meet its contract management obligations.
- Early and comprehensive public engagement with key stakeholders can deliver a better project for the community and for the project sponsor.
- Robust and early customer engagement with end users before operations begin, especially where new and unknown technologies are involved, is critical to a successful opening of a tolled facility.
- Allocation of operational responsibilities should be based on which party is best positioned to manage assigned responsibilities.
- Ensure adequate time is built into the project schedule for testing and commissioning of complex tolling and traffic management systems.
- Promoting opportunities for disadvantaged businesses, including small, women-owned and minority-owned businesses, can help the Procuring Authority meet broader policy objectives.

## PROJECT INCEPTION

### Goals and Objectives of the Partnership

In the early 2000s, the Procuring Authority began advancing plans for a traditional highway expansion to help address growing congestion on the Capital Beltway I-495 in Virginia. The plan faced significant opposition from the community, because it was considered unaffordable, required the demolition of more than 350 homes and businesses, and did not provide the transit options needed to support the local business district. In 2002, the private sector proposed an alternative plan under the Public Private Transportation Act – to build four new HOT lanes that would expand capacity and deliver new travel choices, including a network for buses and carpools. The Procuring Authority embraced the proposal. A partnership with the private sector and tolling would help the Procuring Authority deliver improvements more quickly and with fewer tax dollars, provide new travel choices, and reduce impacts on the community and the environment. The new approach would also reduce the number of homes which needed to be demolished from 350 to just eight.

The Procuring Authority advanced a competitive procurement, a series of environmental reviews, and a public engagement process for the new project. In 2005, local leaders voted to include HOT lanes as part of the

region's long-range transportation plan. In 2007, the Procuring Authority finalised a long-term partnership agreement with the Project Company to design, build, finance, operate, and maintain the USD \$2.069 billion HOT lanes project.

The Project Company's equity investors provided a substantial upfront equity commitment to help fund construction and financed the rest of the project through Private Activity Bonds (PABs) and a Transportation Infrastructure Finance and Innovation Act (TIFIA) loan. PABs are tax-exempt bonds issued by or on behalf of local or state government, to provide special financing benefits for qualified projects. The financing is most often for projects of a private party, and the government generally does not pledge its credit. The TIFIA loan program has a strategic goal to leverage limited Federal resources and stimulate capital market investment in transportation infrastructure by providing credit assistance in the form of direct loans, loan guarantees, and standby lines of credit (rather than grants) to projects of national or regional significance. The arrangement enabled the state of Virginia to leverage private capital to translate every state tax dollar into four dollars of transportation improvements.

According to the project website<sup>1</sup>, the project supported 31,000 jobs and injected approximately USD \$3.5 billion into the economy. The Project Company contracted USD \$490 million of work to disadvantaged businesses and small, women-owned, and minority-owned businesses, which was the largest contribution in Virginia's history for such businesses for a single transportation project at the time.

## MANAGEMENT OF THE PPP CONTRACT

### Transition from financial close to construction

Design plan development, and design review and approval processes initially took longer than anticipated. Through additional resources, improved processes, and a focused, collaborative effort, both parties were able to bring the project back on schedule.

### Construction Phase

During construction, the existing eight-lane (four lanes per carriageway) Beltway was widened to a 12-lane facility, consisting of four general-purpose lanes per side and two HOT express lanes per side, located to the left of the general-purpose lanes. Construction required the replacement of more than 50 overpasses and bridges and the reconstruction of ten interchanges. The project also added direct connections between the Capital Beltway I-495 and the existing I-95/I-395 high-occupancy vehicle (HOV) lanes.

<sup>1</sup> [www.p3virginia.org/projects/i-495-express-lanes/](http://www.p3virginia.org/projects/i-495-express-lanes/)

Construction began in June 2008 and was completed ahead of schedule and on budget, opening to traffic on November 17, 2012. Buses, motorcycles, and vehicles with three or more people are permitted to use the express lanes for free; other vehicles must pay a toll. The toll rates change dynamically according to traffic conditions, which, in turn, regulates demand for the lanes and keeps them operating at high speeds. Tolls are collected solely via electronic means using E-ZPass transponders; no cash toll booths are available. All vehicles using the Express Lanes, including those traveling for free under the high-occupancy vehicle provision, must have a transponder.

The speed limit on the lanes was increased from 55 mph to 65 mph on June 24, 2013, after a Procuring Authority study concluded an increase in speed would not pose a safety risk.

The Project Company was responsible for monitoring quality control and quality assurance of the design and construction, in accordance with the contract and the project management plans it had developed. The Project Authority provided compliance monitoring through independent verification and assurance to ensure contract requirements were met. In addition, project schedule progress and contract compliance were monitored and certified through a general engineering consultant, appointed by the Procuring Authority.

A risk management protocol was adopted by both the Procuring Authority and the Project Company, which was focussed on financial and schedule risk. Primavera P6 was used as the base software to manage the project schedule and to assess potential project schedule risk. In addition, the project team met weekly to resolve identified project risk and scope change items. The risk management protocol also tracked the Procuring Authority's potential financial liability for its retained risks.

### **Transition between Construction and Operations**

The initial communications program to educate drivers started in January 2012 for the November 2012 opening of the I-495 Express Lanes and continued for six months after the opening. Multiple communication approaches were used to educate the entire region on new rules, requirements, and entry and exits of the new system. Drivers were required to buy an electronic transponder to use the system and could elect to purchase an E-ZPass Flex transponder that could be switched to the "HOV" setting when eligible for free use of the road (with three or more occupants). The entire system opened in November 2012 ahead of schedule. Some adjustments were made immediately following project opening due to unanticipated driver behaviour. Overall, initial toll revenues were lower than expected during the first two years of operations.

The drivers were slow to adapt to the new system. The behaviour of the drivers started to change once they realised the benefits the lanes provide, and became increasingly familiar with the dynamically tolled facility, the first-of-its-kind in Virginia.

### **Payment Mechanisms**

All Project Company revenue comes from tolls. The Project Company is required to undertake self-monitoring of its performance, with oversight from the Procuring Authority. The philosophy of this approach is that it is in the interest of the Project Company to keep the roadway open and in good condition, so that drivers will want to continue to use it and continue to pay the tolls. There is monthly and quarterly reporting provided by the Project Company, as well as a small number of KPIs associated with payment deductions in case they are not met. The Procuring Authority meets with the Project Company every month to discuss general operations, tolling and overall performance.

### **Change Management**

The number of changes implemented on the project is considered to be standard. There were some adjustments to the project scope, mainly related to civil works to accommodate approximately USD \$125 million in Procuring Authority-directed changes, and no extensions of time were granted. The Procuring Authority financed (or partnered with other agencies to finance) these changes implemented to accommodate and improve the expanding roadway network in and around the project. These were considered to be typical changes to a large project developed over several years.

The Procuring Authority set up a major project office that assisted in the process of managing changes (see following sections for more information on the major project office) and to reach resolution among the parties on an expedited schedule that was much faster than typical Procuring Authority scope change approval timeframes for routine projects. The major project office meant that the Procuring Authority had staff dedicated to reacting quickly to change management.

### **ROLE OF GOVERNMENT**

The Procuring Authority established an independent major project office to manage the review and approval of early design packages immediately following commercial close. The major project office housed project staff with some additionally hired resources where needed, maximising collaboration among the project team and ensuring focused, timely reviews. The government support was adequately resourced, project-focused, and allowed decisions to be made quickly and for the benefit of both parties to the contract.

## RELATIONSHIP BETWEEN THE PROCURING AUTHORITY AND PROJECT COMPANY

The Procuring Authority described its relationship with the Project Company as collaborative, transparent and successful. This positive relationship allowed the parties to make full use of the Procuring Authority's major project office, and to overcome early delays and deliver the construction phase ahead of schedule, on budget, and with an industry-leading safety record.

### Team Set-Up and Staffing

The Procuring Authority considers its resources and set-up as adequate for the project, once the major project office was in place to enable it to fully meet its obligations. A general engineering consultant was engaged immediately after financial close and provided support for the design approvals and monitoring of the construction progress. The Procuring Authority also received some financial advisory support from third party consultants prior to financial close and during contract development.

On two subsequent projects, the Procuring Authority did not appoint a general engineering consultant after financial close. On these subsequent PPP projects, the Procuring Authority has been able to procure an engineering monitoring team during the procurement phase, to assist in the development of the project contract and documents and to then continue to assist the Procuring Authority in administering the contract through design and construction.

The majority of training for the Procuring Authority staff was delivered on the job.

## KEY EVENTS

### Transition from financial close to construction

Design plan development, and design review and approval process initially took longer than anticipated. Through additional resources, improved processes, and a focused, collaborative effort, both parties were able to bring the project back on schedule. Both parties committed to a collaborative and proactive engagement. The Procuring Authority set up a major project office, providing space for a project-focused team to identify and resolve project issues, and to streamline plan reviews and approvals.

### Challenges to transition to Toll Day 1

The high-occupancy tolling concept was new for end users and initial toll revenues were lower than anticipated during the first two years of operations. The users were not familiar with the new tolling system and the benefits it provides.

## LESSONS LEARNED

**The level of Procuring Authority oversight must align with the risk profile of the PPP project. The Procuring Authority may also need to commit additional resources during peak production periods to meet its contract management obligations.**

The Procuring Authority needs to commit appropriate resources throughout the various phases of project delivery and must be able to increase resources during peak production periods (both design and construction). There can be a misconception that the Procuring Authority's responsibility for project oversight is minimal, which is not accurate. Change management, in particular, requires dedicated resources to meet agreed approval timeframes. Following a slow start on final design development and plan approvals, the Procuring Authority committed dedicated resources to the project, in the form of a major project office, in order to carry out the required reviews and approvals, as well as any other activities that they were best placed to do. This helped to expedite progress and assisted in schedule recovery, resulting in opening the project 45 days ahead of schedule.

**Early and comprehensive public engagement with key stakeholders can deliver a better project for the community and for the project sponsor.**

Initial plans for the project included just one access point into the region's largest employment centre – Tysons Corner. After early feedback from major employers, elected officials and transit advocates, the project team changed the scope of the project to include three major entry and exit points to serve the busy commercial area. By proactively engaging stakeholders early (and outside the traditional public hearing process), the parties were able to work collaboratively to develop a transportation solution that provided a better outcome, helping to diffuse traffic congestion in the area.

**Robust and early customer engagement with end users before operations begin, especially where new and unknown technologies are involved, is critical to a successful opening of a tolled facility.**

The initial communications program started in January 2012 for the November 2012 opening of the I-495 Express Lanes and continued for six months after opening. The robust campaign included multiple tactics required to educate the entire region on new rules, requirements and entry and exits. The I-495 Express Lanes has new entrances and exits, and limited access at certain locations. In addition to a new type of facility, customers also needed to learn where they could get on and off the network. This was a big hurdle for travellers. Communications approaches included

multi-media advertising, on-road banners and dynamic messaging signs, community events, business briefings, direct mail pieces, and incentive programs to drive adoption of the E-ZPass.

**Allocation of operational responsibilities should be based on which party is best positioned to manage assigned responsibilities.**

The I-495 Express Lanes project included construction of both the Express Lanes and general-purpose lane improvements. The Procuring Authority transferred most operational responsibilities and risk to the private sector for the Express Lanes assets, and most responsibility for shared assets, such as sign structures and bridges. This required careful planning to ensure effective coordination and to establish clear responsibilities. The Procuring Authority retained the responsibility for snow and ice removal on the I-495 Express Lanes project in order to achieve benefits of scale and synergies associated with region-wide efforts and to ensure a consistent approach and prioritisation across the transportation network. A partnership agreement provides a framework to ensure both the Procuring Authority and Project Company are incentivised to work together to achieve optimum operations of the overall transportation network.

**Ensure adequate time is built into the project schedule for testing and commissioning of complex tolling and traffic management systems.**

Detailed planning and coordination for the road opening and commencement of tolling should begin at least one year prior to the anticipated opening date, including interagency coordination, customer education, pre-operations planning (e.g., vehicles, staffing enforcement, familiarity with operating system, construction staging to support for final road works etc.). Preparation of opening plans should be closely coordinated between the Procuring Authority and the Project Company, law enforcement, and other transportation and community partners to ensure a smooth and safe opening for customers. Extensive testing of the end-to-end system is critical to verifying the accuracy and reliability of revenue collection and enforcement activities, as well as ensuring a positive experience for toll-paying customers. Developing a “hyper care” period at the initial opening that includes intensified resourcing across all partners can help identify and quickly respond to inevitable start-up challenges.

**Promoting opportunities for disadvantaged businesses, including small, women-owned and minority-owned businesses, can help the Procuring Authority meet broader policy objectives.**

The Procuring Authority had a policy of prioritising disadvantaged business enterprises and small, women-owned and minority-owned businesses, with approximately USD \$490 million of work awarded to these organisations by the construction contractor through a variety of construction sub-trade packages. This was a relatively new concept at the time. The Procuring Authority played an important role in training and preparing small businesses to participate in contract opportunities.