Chapter 4. Public-private partnerships for infrastructure at the subnational level of government: Opportunities and challenges in the Commonwealth of Virginia, United States

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This chapter presents a case study of public-private partnerships (PPPs) for infrastructure development in the state of Virginia, United States. As one of the first US states to enable PPP procurement, Virginia's more than 25-year history with PPPs and their governance provide a unique opportunity to study subnational governments' challenges and success factors in practice. The case study focuses in particular on five categories of challenges: (i) Intergovernmental regulatory coherence; (ii) Financial risks; (iii) Cross-jurisdictional co-ordination; (iv)Administrative capacity and (v) Accountability and transparency. The case study concludes with a summary of Virginia's major PPP drivers, challenges, and success factors, along with a discussion of lessons learned that can inform other subnational governments.

Introduction

As governments throughout the world strive to develop, operate, and maintain infrastructure assets to support their citizens' well-being, procurement practices have advanced beyond traditional approaches. As a result, many governments have turned to alternative procurement approaches to fill resource gaps. Recognising this trend, Principle 6 of the OECD's 2014 Council Recommendation on Effective Public Investment Across Levels of Government notes the potential benefits when government actors, including those at the subnational level, match private financing and expertise with public investment needs and administrative capacity through arrangements including public-private partnerships (PPPs) (OECD, 2014). While such PPP approaches present great potential value, they differ significantly from traditional approaches and often introduce highly complex features and a different allocation of risks. As a result, PPPs offer important opportunities but also important challenges for subnational governments engaged in infrastructure development and delivery.

To develop a greater understanding of the opportunities, challenges, and key support characteristics involved in successful subnational PPP governance, the following discussion explores an example of the United States' PPP experience through a case study in the Commonwealth of Virginia. As one of the first US states to enable PPP procurement, Virginia's more than 25-year history with PPPs and their governance provide a unique opportunity to study subnational governments' challenges and success factors in practice (Buxbaum and Ortiz, 2009: 9).

The case study proceeds as follows. The next section explores the current state of play in the US, focusing on infrastructure needs, the role of subnational governments in addressing these needs, and recent trends in PPP procurement. This is followed by examination of the Virginia PPP experience, with attention to five categories of challenges:

1. Intergovernmental regulatory coherence;
2. Financial risks;
3. Cross-jurisdictional co-ordination;
4. Administrative capacity; and
5. Accountability and transparency.

The case study concludes with a summary of Virginia's major PPP drivers, challenges, and success factors, along with a discussion of lessons learned that can inform other subnational governments.[1]

The US context: Infrastructure needs, PPPs, and the role of subnational governments

With its large, diverse, and post-industrialised economy, its nearly 320 million residents (US Census Bureau, 2015a), and its large and varied geographic area, the United States faces many challenges in developing and maintaining its extensive infrastructure systems. Evaluating the US legacy systems and future needs across fifteen infrastructure categories, the American Society of Civil Engineers' "2017 Infrastructure Report Card" estimated that USD 4.6 trillion in new investment would be needed by 2025 to address the country's infrastructure capacity, operation and maintenance, safety, and resilience needs (American Society of Civil Engineers, 2017: 8). With nearly 100 000 miles of rail and more than 4 million miles of roadways, 10 000 miles of transit, 5 000 public-use

airports, 185 000 miles of oil pipeline, and 1.5 million miles of gas pipeline, public infrastructure investment represents a significant undertaking for US subnational governments (USDOT 2015a; 2015b).

The US federal system of government operates under a decentralised structure with authority divided between the federal government, fifty state governments, and thousands of city, county, and other municipal and local governments. Infrastructure provision responsibilities are particularly fragmented, with primary authority resting with subnational governments. As in many other OECD countries, subnational governments in the US account for the bulk of total public investment (55.2% in 2014) (OECD, 2016). Looking at transportation and water infrastructure, US states and local governments accounted for 62% of capital spending in 2014 (US Congressional Budget Office, 2015). For example, since the early 19th century, subnational governments have maintained primary responsibility for roadway provision, although some federal funding programmes developed during the early 20th century. The federal government's funding role in highway provision increased substantially during the mid-20th century when the National Interstate and Defense Highway Act (1956) and the Federal Highway Trust Fund provided 90% or more in federal funding for interstate highway construction. Maintenance funding responsibility remained with the states, however (Seely, 1987; Gifford, 2003). While the interstate highway system represents an exceptional case of federal financial support, federal regulatory frameworks do address environmental protection, community impacts, hazardous material, and vehicle safety concerns. State and local governments maintain primary authority for assessing and addressing their citizens' infrastructure needs. This arrangement limits centralised planning and control, but provides enhanced opportunities for locally appropriate solutions, experimentation, and citizen engagement.

In the US infrastructure sector, the term public-private partnership encompasses a range of contract types that shift facility construction, funding, financing, operation, and/or maintenance activities to private partners (Custos and Reitz, 2010: 555; FHWA, n.d. c). Starting in the late 1980s, US PPPs began to increase private-sector participation compared to traditional design-bid-build (DBB) approaches, bundling design, construction, financing, operation, and/or maintenance phases into single private-sector delivery agreements. While the public sector usually retains facility ownership, PPP arrangements typically rely on private partners to make significant investments, allowing them to raise revenue through tolls, user fees, and/or public payments (US General Accounting Office, 1999: 13–14). Such PPP structures include, but are not limited to: design-build (DB); private service and/or maintenance contracts; design-build-operate-maintain (DBOM); build-operate-transfer (BOT); build-transfer-operate (BTO); design-build-finance (DBF); design-build-finance-operate (DBFO); design-build-finance-operate-maintain (DBFOM); and long-term lease agreements or concessions (brownfield) (FHWA, n.d.c; Buxbaum and Ortiz, 2009: 8). These public-private arrangements offer access to private capital, financing, and expertise, along with a range of time saving, cost saving, and quality improving benefits derived from: a) private-sector incentives for on-time delivery, facility quality, and life-cycle efficiencies; b) cost, scheduling, and revenue risk-transfers; and c) innovative technologies and techniques (Rall, Reed, and Farber, 2010: 9–10).

Between 2007 and 2013, transportation PPP projects accounted for about USD 22.7 billion in public and private funds, or about 2% of total capital highway investments in the United States over that period (USDOT, 2015c: 173). Specifically, funding for transportation PPP projects in the US market comes from two primary sources: user fee revenues (tolls, fares) and government appropriations. In addition,

financing arrangements generally fall into two categories: revenue risk and availability payment (AP). For revenue risk projects, a significant portion of the financing depends on toll revenues for repayment, which, in turn, depend on future traffic. For AP projects, in contrast, the government promises to pay the concessionaire a fee subject to the concessionaire's delivery (i.e. making available) of a properly operated and maintained facility. The concessionaire takes "appropriation risk," that is, the risk that the government will fail to appropriate the funds to make its payment. On the other hand, the concessionaire also retains the ability to curtail access (i.e. availability) of the facility if the government fails to pay. States vary in how they register these availability payment obligations on their balance sheets. Some states consider all such obligations as debt and record liabilities. Others allow the exclusion of such future contractual obligations from balance sheets. Rating agency treatment of availability payments is tending toward including them as a factor in assessing issuer creditworthiness (Hecht, 2015).

Recognising the potential offered by innovative delivery approaches, the US federal government began supporting state-level PPP experimentation nationwide in the 1990s. Highway provision provides an illustrative example. As road networks expanded during the mid-20th century, states turned from in-house design approaches to DBB processes in which public agencies procured project designs from private engineering firms and bid out project construction. By the early 1990s, however, growing dissatisfaction over cost and schedule over-runs, poor facility quality, and deferred maintenance drove advancements in state of the art project delivery strategies. The federal government undertook several actions to support these innovative procurement approaches. For example, the Federal Highway Administration (FHWA) established Special Experimental Project Number 14 (SEP-14) in 1990, allowing states to experiment with innovative procurement methods for projects supported by federal funds. By 2002, 140 highway capital projects worth USD 5.5 billion[2] resulted from DB approaches supported by this programme (US General Accounting Office, 1997; FHWA, 2006).

More recently, the US Department of Transportation (USDOT) established several federal programmes supporting innovative procurement strategies, private-sector involvement, and PPPs at the subnational level. For example, the FHWA formed its Innovative Program Delivery office in 2008 to offer tools, resources, technical assistance, outreach, and other support for communities considering innovative procurement, delivery, and financing approaches (FHWA, n.d. b). In addition, the department formed the Build America Transportation Investment Center (BATIC) in 2015 to support communities pursuing P3 approaches for transportation infrastructure projects across all modes (USDOT, 2015d). National-level professional organisations also provide P3-related resources and support, including the National Conference of State Legislatures' Public-Private Partnerships for Transportation: A Toolkit for Legislators (Rall, Reed, and Farber, 2010; Rall, 2014) and the American Association of State Highway and Transportation Officials' Transportation Finance Clearinghouse (American Association of State Highway and Transportation Officials, 2015). The US Economic Development Administration provides non-infrastructure grants to subnational partners for capacity building on PPP and general infrastructure delivery. Similarly, the National Governors Association has also offered workshops and resources for state officials (National Governors Association Center for Best Practices, n.d.).

While the US federal government supports procurement experimentation and alternative financing at the subnational level, the United States lacks a national PPP statutory framework. Instead, states maintain primary responsibility for allowing PPP approaches and establishing PPP programmes (Rall, Reed, and Farber, 2010: 15). As of July 2015, thirty-three states, the District of Columbia, and Puerto Rico enacted statutes enabling

PPP approaches for transportation infrastructure delivery (FHWA, n.d.d). PPPs for "social infrastructure" (e.g. hospitals, schools, and public facilities) remain much less common in the United States. Unlike water, wastewater, or transportation projects, such facilities rarely qualify for favourable treatment under the federal funding programmes and tax policies discussed in more detail below (US House of Representatives, 2014: 18, 34).

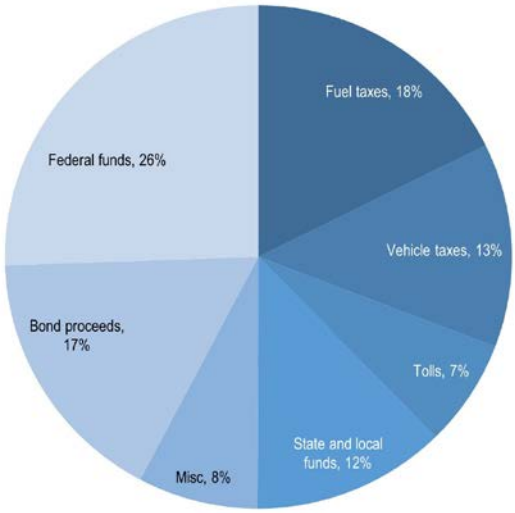
State statutory frameworks and PPP programmes vary considerably, ranging in programme scope, policy and geographic objectives, allowable proposals (e.g. solicited vs. unsolicited), qualifying facilities, qualifying partners, allowable delivery mechanisms, and implementing agencies (Buxbaum and Ortiz, 2009: 13–15, 27; Rall, Reed, and Farber, 2010: 11, 13, 41–59). A diverse PPP project history has arisen from this statutory diversity. Between 1989 and 2011, the United States developed 96 transportation PPP projects collectively valued at USD 54.3 billion. Three quarters of this investment occurred in eight states: Texas (USD 9.57 billion); California (USD 6.02 billion); Florida (USD 4.63 billion); Colorado (USD 4.85 billion); Indiana (USD 3.85 billion); Virginia (USD 3.88 billion); Utah (USD 3.66 billion); and New Jersey (USD 3.35 billion) (Reinhardt, 2011: 25-26). These eight states represent large economies, long PPP programme histories, and/or favourable statutory frameworks for PPPs. Favourable statutory frameworks, in turn, develop in states with higher traffic congestion due to state legislators' focus on the problem (Geddes and Wagner, 2013). During the 1989 to 2011 period, states have generally preferred DB, DBF, or DBOM approaches, building 79 projects worth USD 31.5 billion using these arrangements, although 11 projects worth USD 12.4 billion employed DBFOM or concession contracts. The remaining four projects, worth USD 6.9 billion, involved asset privatisations (Reinhardt, 2011: 25–26).

PPPs will likely remain an increasingly popular alternative to traditional design-bid-build procurement as infrastructure needs develop, existing facilities age, maintenance costs rise, and capital expenditures fall. Between 2003 and 2014, for example, US inflation-adjusted public spending on transportation and water infrastructure fell by 23% for capital projects but increased 6% for operation and maintenance (US Congressional Budget Office, 2015: 12).

The US federal government offers a variety of grant and loan programmes for subnational infrastructure investment, many of which are supported by the Highway Trust Fund. Originally established in 1956 to fund the interstate highway system, this fund today uses federal fuel tax revenue to fund 25% of all national transit and highway investment. Unfortunately, inflation and improving vehicle fuel efficiencies have eroded the fuel tax base, forcing the fund to the brink of insolvency in recent years. Without sufficient political will to raise federal fuel taxes, the government has preserved the fund's solvency through a chain of multi-billion dollar stopgap measures drawing from the general fund (FHWA, 2014d; Morris, 2015; Halsey and Eilperin, 2014; Rubin, 2015). The most recent surface transportation authorisation, the FAST Act (Fixing America's Surface Transportation Act, Pub. Law 114-94), signed into law on December 4, 2015, maintains this policy. The act did not raise fuel taxes and authorised supports the Highway Trust Fund with approximately USD 70 billion in transfers from the general fund.

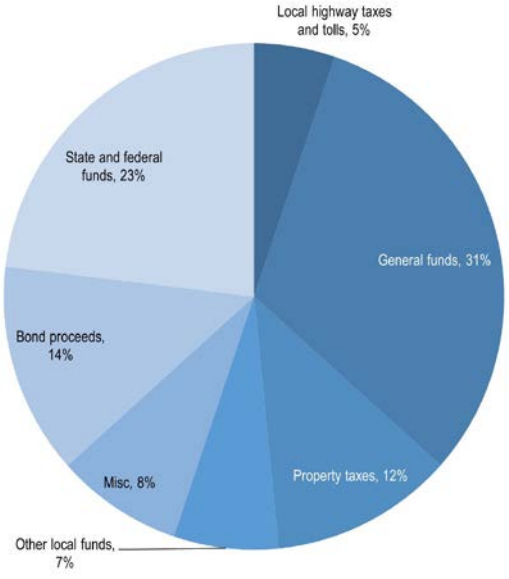
Many states have similar revolving funds and state infrastructure banks facing parallel challenges (Puentes and Thompson, 2012; Gifford, 2010). With their strong reliance on federal funds and tax revenues (see Figure 4.1. for the highway sector), state and local infrastructure programmes have also struggled to find sufficient funds to address their infrastructure needs through traditional sources.

Figure 4.1.State highway funding



Sources: US Federal Highway Administration (FHWA 2014c), "Highway Statistics 2013: Revenues Used by Local Government for Highways – 2012", www.fhwa.dot.gov/policyinformation/statistics/2013/lgf1.cfm; FHWA (2014e). "Highway Statistics 2013: Revenues Used By States for Highways – 2013", www.fhwa.dot.gov/policyinformation/statistics/2013/sf1.cfm#foot1.

Figure 4.2. Local highway funding



Sources: US Federal Highway Administration (FHWA 2014c), "Highway Statistics 2013: Revenues Used by Local Government for Highways – 2012",www.fhwa.dot.gov/policyinformation/statistics/2013/lgf1.cfm; FHWA (2014e). "Highway Statistics 2013: Revenues Used By States for Highways – 2013", www.fhwa.dot.gov/policyinformation/statistics/2013/sf1.cfm#foot1.

Beyond its traditional grant and loan programmes, the federal government also offers several programmes and policies that support innovative financing. The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA), for example, provides credit assistance for large transportation projects. This programme became particularly attractive following the 2008 financial crisis. In addition, 2005's Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) included provisions allowing tax-exempt Private Activity Bonds (PAB) for up to USD 15 billion in selected highway and freight projects developed and operated by private parties (FHWA, 2015). Similarly, the American Reinvestment and Recovery Act of 2009 created Build America Bonds (BAB) following the 2008 financial crisis to provide subsidised municipal financing. The programme expired in December 2010, but enabled 2 275 BAB issues supporting more than USD 181 billion in public infrastructure projects (US Treasury Department, 2011).

Finally, federal and state municipal bond policies exempt interest paid on bonds issued by subnational governments (including Puerto Rico) from federal and state income taxes. This represents a distinct feature of the US infrastructure financing system and as a result, interest rates for municipal debt have typically been lower than for taxable debt. In addition, the US municipal bond market is large — USD 3.7 trillion in mid-2015 — and liquid, serving as a principal source of capital for states and localities (US House of Representatives, 2014: 10). However, states typically cap their bond issuance in order to protect their bond ratings. As a result, competition within a state for access to state and municipal bond funds is often fierce, limiting the debt capacity available for transportation infrastructure investment. In addition, interest paid by PPPs is often taxable under federal or local law, leading to higher market rates for PPP project debt (for a more detailed discussion of project finance see, for example, Esty 2003). Note, however, that the Internal Revenue Service's (IRS) Rule 63-20 and Revenue Proclamation 82-26 have allowed non-profit public-benefit corporations to issue tax-exempt municipal bonds, opening another financing option for PPPs (US Securities and Exchange Commission, 2012; FHWA, n.d.a).

Subnational PPPs: The Virginia case

The Commonwealth of Virginia, located on the US mid-Atlantic coast, was first settled at Jamestown in 1607, making it one of the 13 original American colonies ("Virginia - US States", 2015). Its legislative body, the Virginia General Assembly, established as the House of Burgesses in 1619, represents the oldest continuous law-making body with elected representatives in the new world (Virginia General Assembly, n.d.). The state also boasts the first American highway legislation (1632) and arguably the first American toll road (1772) (VDOT, 2006: 5, 10). Today, the state covers 39 490 square miles (102 280 sq. km), with a population of over 8 million people (US Census Bureau, 2015b) and a primarily service-based economy (Table 4.1).

Table 4.1. Virginia GDP by industry group (2014)

Industry	GDP (USD millions)	% of total state GDP
Finance, Insurance, Real Estate, Rental, and Leasing	90 765	20%
Government	86 462	19%
Professional and Business Services	84 891	18%
Construction and Manufacturing	59 349	13%
Other Services	43 932	9%
Wholesale and Retail Trade	43 620	9%
Education, Health Care, and Social Assistance	32 154	7%
Utilities and Transportation	17 964	4%
Mining and Natural Resources	4 476	1%
Total	463 613	100%

Source: US Bureau of Economic Analysis (2014), "Regional Data, GDP & Personal Income", www.bea.gov/iTable/index_regional.cfm.

PPP drivers and statutory history

Virginia's recent history with alternative infrastructure procurement originated in 1986 when Governor Gerald L. Baliles identified transportation infrastructure development as a top priority for his administration (Virginia General Assembly, 1986: 15–25). A specially-formed Commission on Transportation in the 21st Century (COT-21) evaluated the state's transportation needs and funding options and ultimately identified USD 7 billion in needed transportation investment (USD 15 billion in 2015 dollars). At the same time, private actors submitted draft legislation permitting privately-funded toll road development in the state. Following the Commission's recommendation to the state legislature, this draft developed into Virginia's first PPP enabling statute, the Virginia Highway Corporation Act of 1988 (HCA) (Levy, 1996).

Enacted with the intent of accelerating roadway construction and improving cost efficiencies, HCA permitted the submission of proposals by private parties for toll-based roadway construction and operation. The state's Commonwealth Transportation Board reviewed and approved the proposals' locations, designs, costs, interconnection requirements, and public needs assessments, while the Virginia Department of Transportation (VDOT) arranged comprehensive agreements for facility inspections. The State Corporation Commission (SCC) then reviewed the proposals; if approved, the private partners received certificates of authority allowing them to construct and operate their toll road facility for up to ten years following the original permanent financing's term. To protect the public interest, the SCC regulated the resulting facilities and authorised tolls. Upon termination, facility ownership reverted to the state.

Five years after HCA, in 1993, the state legislature, the Virginia General Assembly, began re-evaluating the state's procurement processes, establishing the Joint Subcommittee Studying Privatisation of Certain State Government Functions to consider infrastructure project and highway maintenance privatisation among other government activities (Virginia General Assembly, 1993; 1994). As the Joint Subcommittee developed its findings, the General Assembly passed the Qualifying Transportation Facilities Act of 1994 (QTFA), allowing PPP procurement for a wider range of qualifying transportation facilities and shifting primary proposal review from the SCC to whatever "responsible public entity" had "the power to acquire, construct or improve the applicable transportation facility." Nevertheless, approved projects still required SCC certification and remained under its regulatory authority as public service commissions or utilities.

The Joint Subcommittee's final report, issued in May 1995, proposed several changes to the new QTFA statutory framework. It first recommended that responsible public entities assume sole responsibility for project approvals, limiting SCC involvement to regulating comprehensive agreement terminations under default conditions. The report then recommended allowing public entities to solicit PPPs through requests for proposals (RFP). It also recommended clearly exempting qualifying PPP facilities from the state's public procurement laws (Virginia General Assembly, Joint Subcommittee Studying Privatisation of Certain State Government Functions, 1995: 3–5). In response, the General Assembly quickly amended and re-titled QTFA to create the Public-Private Transportation Act of 1995 (PPTA).

PPTA addressed most of the Joint Subcommittee recommendations, adjusting the qualifying facility definition, permitting public-agency PPP RFPs, shifting proposal approvals and oversight from the SCC to responsible public entities (including user-fee setting and termination dates), exempting PPPs from the Virginia Public Procurement Act, and removing the ten-year concession limitation. Looking to extend the state's PPP programme to a broader range of infrastructure sectors, seven years later the Virginia General Assembly passed the Public-Private Education Facilities and Infrastructure Act of 2002 (PPEA), replicating PPTA's PPP procurement statutes for educational, governmental, and other public infrastructure facilities.

The steady expansion of Virginia's PPP statutes reflects the changing environment influencing its infrastructure sector over the past several decades. Growing urban population centres, for instance, have increased traffic congestion and project complexity as new projects are developed to respond to high population densities and existing facilities. The highway capacity expansions developed under the 495 Express Lanes project, for example, had to accommodate the quarter million vehicles already travelling in the existing lanes (Samuel, 2013). Newly relevant alternative transportation modes (e.g. bikes, buses) and land use policies (e.g. transit-oriented development) have also contributed to increased project complexity and inter-governmental co-ordination requirements. Increasing costs, rising consumer expectations, and technological innovations have also complicated Virginia's infrastructure investment environment and disrupted traditional procurement processes (Gifford et al., 2015b).

Such challenges will likely persist into Virginia's future. Policy makers anticipate a growing but aging population, especially in urban northern Virginia, Fredericksburg, Richmond, and Hampton Roads. They also foresee a shift from automobile reliance to a more multi-modal and rail-based transportation system, along with continued need for technological, user information, sustainability, and resilience enhancements. To address these needs, their infrastructure investment plans stress return-on-investment optimisation; safety, security, and resiliency improvements; more efficient programme delivery; operational improvements and demand management; improved transparency and accountability; and improved land use and facility co-ordination (Virginia Office of Intermodal Planning and Investment, 2015: 19–21, 26–28, 33).

Despite these challenges and investment needs, public infrastructure budgets and bond issues have not grown commensurately. The 2008 economic downturn particularly diminished revenues from sales taxes, and motor vehicle sales and use taxes, which account for about a third of Virginia's transportation funding. While the American Recovery and Reinvestment Act of 2009 provided nearly USD 700 million in highway stimulus funding (VDOT, 2012a), state and federal programmes using motor fuel taxes to support about half of the state's transportation funding have become less reliable as

inflation and increased fuel efficiencies erode the tax base (Virginia Office of Intermodal Planning and Investment, 2010: 64–66). Considering the state's increasingly complex infrastructure needs and stagnating funds, the private-sector development, funding, financing, and management options offered by PPP procurement arrangements present appealing solutions.

PPP project experience

Given Virginia's long history with transportation-related PPP statutes under HCA, QTFA, and PPTA, transportation infrastructure projects offer some of its largest and most visible PPP endeavours, although the programme is currently considering a range of PPP development opportunities related to air rights, solar energy, broadband, cell towers, advertising, interstate lighting upgrades, customer service facilities, and airport runway maintenance (VAP3, 2015f). While PPEA has supported a range of public and educational facilities at the local level, these smaller, typically design-build projects have not been documented systematically given the many state and local entities arranging the partnerships. As a result, the following case analysis draws primarily from transportation projects (see Table 4.2) to explore five categories of challenges facing subnational governments engaged in PPP infrastructure development: 1) intergovernmental regulatory coherence; 2) financial risks; 3) cross-jurisdictional co-ordination; 4) administrative capacity; and 5) accountability and transparency.

Intergovernmental regulatory coherence

PPP statutory frameworks and regulations that vary across federal and subnational governments can complicate investment environments for potential private partners, raising business costs and discouraging their participation (Mizell and Allain-Dupré, 2013: 37). In the US, complex interactions between large infrastructure projects and state and federal environmental protection statutes present the most compelling example (Custos and Reitz, 2010: 571), often delaying projects and greatly increasing total project costs (e.g. see Virginia's 495 Express Lanes Case, Daito et al., 2013; or California's South Bay Expressway case, Gifford, Bolaños, and Daito, 2014). In addition, the state-based US PPP market, despite guidance and support from federal programmes, offers a highly variable and confusing operating environment for private actors navigating the range of proposal, financing, facility, partner, and institutional regulations maintained by each state (Istrate and Puentes, 2011: 8; Rall, Reed, and Farber, 2010: 41–59).

Table 4.2. Virginia transportation PPP project history

Completed	Under construction
Dulles Greenway	Elizabeth River Crossings
I-495 Capital Beltway Express Lanes	Route 58 Tri-County & Laurel Forks
Route 895, Pocahontas Parkway	Coalfields Expressway
Route 199	Route 28
Route 58	Dulles Rail
Route 288	
I-95 Express Lanes	
	Under procurement
	I-66 Transformation
	Route 460
	Odd Fellows Road Interchange
	I-73 Corridor
	NOVA Commuter Fast Ferry Service
	NOCA North-South Connector
	I-95 Statewide Corridor Improvements
	I-64 Corridor Improvements
	Port of Virginia
	Southeastern Parkway & Greenbelt
	Powhite Parkway Extension
	Western Washington Bypass
Under consideration	No longer under consideration
I-495 Express Lanes Extension	Route 460
I-66 Corridor Park-and-Ride System Enhancements	Odd Fellows Road Interchange
Statewide Rest Area & Parking Asset Enhancements	I-73 Corridor
Hampton Roads Crossings Improvements	NOVA Commuter Fast Ferry Service
Route 460/58 Connector	NOCA North-South Connector
Patriots Crossing	I-95 Statewide Corridor Improvements
I-64 to HOT	I-64 Corridor Improvements
	Port of Virginia
	Southeastern Parkway & Greenbelt
	Powhite Parkway Extension
	Western Washington Bypass

Source: Virginia Office of Public-Private Partnerships (VAP3) (2013), "Public-Private Transportation Act Projects", www.p3virginia.org/wp-content/uploads/2014/12/2013_PPTA_Portfolio_Map_final1.pdf; VAP3 (2015), "Projects", webpage, www.p3virginia.org/p3-projects; VAP3 (2015), "Draft 2015 Virginia P3 Project Pipeline", www.p3virginia.org/wp-content/uploads/2015/10/Clean-copy-Revisions-to-2015-PipelineOctober2620151.pdf.

Virginia addressed this regulatory coherence problem, in part, by adapting its PPP enabling statutes to produce a flexible and inclusive PPP programme (Gifford and Transue, 2015). From the outset, each of its PPP enabling acts instituted a state-wide, programmatic approach without geographic or political restrictions (HCA, QTFA, PPTA as amended, PPEA as amended). As the state's statutory framework developed, this programme flexibility extended to a nearly unlimited range of qualifying proposal types (solicited and unsolicited), facility types (transportation, education, utility, government), partner types, delivery approaches, and financing options (PPTA, as amended in 2001, 2005, and 2006; PPEA, as amended in 2003, 2005, 2007, 2008, and 2009). As a result, private parties encounter few limitations in these respects.

Virginia PPP projects have also faced limited legislative intervention. State law does not require legislative approval prior to facility procurement, relying instead on responsible public entities for project review, approvals, and management. Some argue that

legislative approval at or near commercial close can preserve public accountability and protect the public interest. Limiting legislative involvement at such a late stage can greatly reduce the political risk that can discourage private participation (Rall, Reed, and Farber, 2010: 16, 18–19; Buxbaum and Ortiz: 2009, 13–14). To address public oversight concerns without introducing direct legislative approval, a 2015 PPTA amendment established the Transportation Public-Private Partnership Advisory Committee, which is comprised of members from the gubernatorially-appointed Commonwealth Transportation Board, legislative staff, and the executive branch, and charged with assessing whether proposed projects serve the public interest.

In addition to its inclusive statutes, Virginia's PPP programmes have developed implementation guidelines to help potential and active partners understand and navigate the state's PPP procurement procedures. In response to 2005 amendments to PPTA and PPEA requiring these guidelines, the state developed formal PPTA implementation guidelines in 2005, with updates in 2008, 2010, 2012, and 2014 (additional updates are under development) (Commonwealth of Virginia, 2005; 2008a; 2010; 2012; 2014; 2016). It developed equivalent PPEA implementation guidelines in 2002 with updates in 2006 and 2008 (additional updates are under development) (Commonwealth of Virginia, 2002; 2006a; 2006b; 2008b; 2015). These detailed guideline documents provide thorough descriptions of the PPP programme's objectives and organisational structure, as well as their project identification, screening, development, and procurement processes. Together these guidelines provide transparency and consistency for private-sector entities interested in providing investment and innovations to address the state's infrastructure needs.

Virginia's PPP programme also benefitted greatly from the formation of Virginia's Office of Public-Private Partnerships (VAP3), formerly the Office of Transportation Public-Private Partnerships (OTP3), following an independent PPTA programme review, to develop and implement the state's PPP programme and streamline long project development and implementation processes (Daito et al., 2013: 40; KPMG Infrastructure Advisory, 2010). The office works with seven transportation-related departments to develop PPP infrastructure projects and provides education and feedback by developing and disseminating implementation manuals and guidelines, presentations, forms, outreach events, and other resources to support relationships with the private sector and the general public (VAP3, 2015c; 2015a). (See the Administrative Capacity section below for additional discussion.)

Finally, Virginia's PPP programme works to develop public-interest projects that remain sufficiently attractive for private investment, even when public policy diverges from private-sector interests. For example, state policy encourages carpooling, typically exempting high occupancy vehicles (HOV) from tolls to the disadvantage of toll-collecting concessionaires. To accommodate both HOV policy and private financial viability, several Virginian PPP concession agreements include provisions ensuring lost-revenue compensation for concessionaires if/when HOV traffic exceeds a pre-determined rate. According to the I-95 Express Lanes agreement, for example, the state will pay 70% of the average toll for HOV vehicles exceeding 35-38% of total traffic flow (VDOT, 2012b: 13–14). For the first two quarters of operation in 2015, HOV traffic accounted for 32% of all traffic in these lanes, approaching the compensation threshold (Shenk, 2015a; 2015b). The 495 Express Lanes agreement includes a similar provision for HOV vehicles exceeding 24% of total traffic flow (VDOT, 2007). Such provisions offer a mechanism to accommodate both public and private sector interests to produce a mutually beneficial project.

Financial risks

Since PPPs offer access to private-sector capital investment and financing, they can present appealing options for public-sector decision makers looking to locate new or timely financing options for public infrastructure investment. Virginia does not currently use availability payments and has instead relied exclusively on revenue risk financing complemented by direct government funding.[3] For instance, private investments, supported by private activity bonds and federal TIFIA loans, enabled Virginia's 495 Express Lanes project just as the 2008 credit crisis undermined more traditional financing instruments (Daito et al., 2013: 43). Along with their many valuable and timely opportunities however, PPP approaches generate substantial and long-term design, revenue, and debt-related risks. Consequently, decision makers must carefully evaluate whether a PPP project's projected benefits outweigh its resultant risks and liabilities (Koelemay, 2015). Only projects fitting this criterion and addressing the public's long-term public interests should be considered for PPP procurement.

Appropriate project selection has formed an important component of Virginia's PPP program. Each of the enabling acts conditioned project approvals on formal findings of public need and/or public interest, particularly with respect to existing public sector transportation plans. In addition, while PPTA and PPEA exempt PPP projects from the Virginia Public Procurement Act, they require that responsible public entities develop equivalent procedures preserving competitiveness, protecting the public interest, and demonstrating that accepted projects provide sufficient benefits under PPP procurement when compared to their risks and to traditional procurement.

While Virginia has developed and/or completed many PPP projects, it has also rejected a large number (see Table 4.2). For some, like Route 460 and Odd Fellows Road, the state's screening evaluations determined that PPP procurement would not offer better value than more traditional procurement approaches (VAP3, 2015e; 2015b). Other proposals, like the NOVA Commuter Fast Ferry Service and the Powhite Parkway Extension, demonstrated insufficient economic viability or cost effectiveness (VAP3, 2014a; 2014b). These cases signal caution by responsible public entities using alternative procurement approaches only where they promise to meet the public's needs efficiently and effectively.

Even the best projects face real risks however, especially regarding debt repayment and investment returns under concession agreements lasting fifty years or more. Large and complex infrastructure projects depend on demand and revenue forecasts in advance of construction because capital investments in infrastructure assets typically become indivisible and immobile, exposing investors to revenue risk (Medda, 2007). Unfortunately, many projects fail to meet their demand forecasts. Up to 90% of transit projects worldwide have failed to meet their demand forecasts (Siemiatycki and Friedman, 2012), for example, and 20% to 30% differences between projections and actual demand are typical across the transportation sectors (Trujillo, Quinet, and Estache, 2002). Demand overestimation for toll roads has even exceeded observed traffic flows by up to 60% in some international cases (Checherita and Gifford, 2007). Despite careful project selection, several Virginia projects have experienced this predicament.

For example, the first toll road built under HCA, the Dulles Greenway connecting Leesburg with the Washington Dulles International Airport, failed to meet traffic projections after it opened in 1995 just as a real estate market downturn began. With revenues reaching only about one third of expectations, the project required debt restructuring and design and contract modifications between 1997 and 2013 to remain

operational. A few years later, the Route 895 (Pocahontas Parkway) toll facility connecting Chesterfield and Henrico counties south of Richmond faced similar difficulties. With disappointing demand and earnings equalling less than half of expectations upon opening in 2002 – again attributable in part to a real estate downturn – the project experienced several contract modifications and owner changes with significant investment losses (Gifford, Bolaños, and Daito, 2014). The state was not responsible for paying the debt obligations in either case, nor did it provide bailouts. Instead, it relied on restructuring and contract modification processes to keep the facilities open, including allowing toll increases and a concession extension for the Dulles Greenway project. This approach reflects the US bankruptcy system's preference for debt restructuring over asset liquidation, a potential divergence from Europe's experience (Gifford, Bolaños, and Kweun, 2015a). Nevertheless, such experiences motivated statutory changes strengthening Virginia's proposal review processes and may have a chilling effect on PPP enthusiasm within investment markets and the public sector.

While Virginia's PPP project approvals have always depended on the reasonableness of their proposed designs, schedules, and financing plans, as the programme matured into the 21st century, the state legislature began strengthening PPTA and PPEA's review requirements, particularly with regard to risk. In 2007, for instance, an amendment to PPEA required additional review for proposed comprehensive agreements creating state tax-supported debt, requiring significant appropriations, or significantly altering state discretion over future service levels or service funding. A year later, a 2008 PPTA amendment required independent audits of all traffic, cost, and taxpayer liability estimates for projects whose estimated construction costs exceed USD 50 million. More recently, a 2015 amendment to PPTA required formal findings of public interest from responsible public entity chief executives, with concurrence from the Transportation Public-Private Partnerships Advisory Committee, prior to PPP procurement, providing detailed risk disclosures, outlining measures to address these risks, and demonstrating that project benefits outweigh the prevailing risks. Together, these statutory amendments have greatly strengthened the PPP programme's risk review procedures but have also raised concerns that project cancellation risks might discourage potential bidders from developing proposals.

Virginia's PPP programme has also encountered problems regarding user fees. While tolls and other user fees often form the foundation for PPP facilities' financial viability, pricing and implementation choices require careful consideration, especially in places where user fees have proven unpopular for customers. Virginia's PPP enabling statutes maintain public-sector regulatory authority over tolls and user-fee setting procedures, aiming to ensure viable private rates-of-return while also protecting users and encouraging facility use (Buxbaum and Ortiz 2009, 29–30, 40). While HCA originally gave the State Corporation Commission authority over tolling, PPTA and PPEA shifted user fee setting and approvals to the comprehensive agreements negotiated by responsible public entities. In practice, however, tolls can be difficult to implement due to technical challenges (e.g. electronic toll collection, congestion management pricing) and public resistance.

For example, under the Elizabeth River Crossing DBFOM project currently under construction, a large portion of the project's estimated USD 2.1 billion construction cost was to be financed through toll revenues, particularly USD 268 million in tolls collected from the existing tunnels starting several years before the project's completion (FHWA, 2014a). The public objected to the tolling plan, however (Reinhardt, 2012; Samuel, 2012a), and the project has since experienced several public-sector-initiated contract

renegotiations to modify and delay tolling implementation (Samuel 2012b; Virginia Office of the Governor, 2014; VDOT, 2015). A Portsmouth resident even sued, arguing that VDOT imposed the tolls unlawfully, but a 2013 Virginia Supreme Court ruling decided the case in the state's favour (Elizabeth River Crossings OPCO, LLC v. Meeks, 749 S.E.2d 176 (Va. 2013); Gifford, Bolaños, and Daito, 2014). Despite this court decision, anti-tolling sentiment has solidified politically in Virginia and might discourage, or at least complicate, future PPP procurements using this important revenue source.

Cross-jurisdictional co-ordination

Qualifying PPP projects often entail wide scope to benefit from economies of scale and positive spillovers across jurisdictions. Virginia's recent I-95 Express Lanes and Elizabeth River Crossings projects, costing USD 925 million and USD 2.1 billion, respectively, with concession agreements lasting fifty years or more, demonstrate just how extensive PPPs can be (VAP3, 2015f; FHWA, 2014a; 2014b). These billion-plus dollar projects involve long-term co-ordination, co-operation, and management across dozens of actors and subnational governments (Koelemay, 2015), with affected jurisdictions often representing different views, risks, benefits, and responsibilities. A diversity of stakeholders can complicate co-ordination efforts and, given the United States' highly decentralised system of local governments, might discourage PPP use as a result (Mizell and Allain-Dupré, 2013: 18-19). In the Elizabeth River Crossings case, for example, leaders of the city of Portsmouth, were particularly concerned that its residents would be disproportionately affected by the imposition of tolls on river crossings that had previously been toll free.

The Virginia state government's exceptional (by US standards) control over its roadways may have simplified its PPP experience somewhat in the surface transportation sector. Unlike many states, only two of Virginia's 100 counties maintain their own roads; the state government assumed this responsibility during the Great Depression. As a result, VDOT supports 57 867 miles of state-maintained highways, 10 561 miles of urban streets, 12 600 bridges, 6 tunnels, 2 toll facilities, 4 ferry services, rest areas, and several commuter parking lots (VDOT, 2014; Gifford et al., 2015b). While this centralised control can simplify planning, it adds a substantial administrative burden for VDOT and limits county and local-government participation (Gifford, 2011).

Virginia's PPP statutes also require that proposal reviews consider a proposed project's compatibility with existing public infrastructure development plans and their objectives. PPP approval processes also provide sixty-day comment periods for affected jurisdictions. Responsible public entities must consider these comments before approving alternative procurement (QTFA; PPTA as amended in 2005; PPEA). The VAP3 also plays a role in co-ordination, information dissemination, and technical assistance.

Nonetheless, such activities cannot prevent all conflict. Existing transportation service providers may resist entry by new competition. Communities often oppose projects that increase traffic through their borders. In the I-95 Express Lanes case, original project plans included a 6-mile stretch through Arlington County and Alexandria connecting the District of Columbia and northern Virginia. Arlington County objected, ultimately suing in August 2009 to challenge the project's environmental reviews, potential for increased traffic congestion and emissions, and possible effects on minority populations. Facing mounting delays the state eventually revised the project to remove that portion (Goodman, 2011; Halsey, 2009), although an I-395 Express Lanes Extension came back under consideration in late 2015 (VDOT, 2016).

Administrative capacity

Most subnational governments shifting from traditional design-bid-build procurement approaches to an innovative PPP programme require new technical and administrative skills. PPPs introduce a range of new relationships, development processes, risk evaluations, and contract management requirements that challenge existing public and private-sector strategic, executive, institutional, and cross-cultural capacities. Adopting PPP procurement challenged the routines of Virginia's public sector, forcing agencies like VDOT to change focus and develop new relationships, organisational structures, skills, and management styles. In some cases, this meant shifting focus from physical infrastructure delivery to service provision. In many other cases, agencies developed new relationships with the private sector and with other public agencies to execute complex alternative financing and procurement approaches. In the process, many state agencies recognised the need for stronger public engagement as well, developing improved outreach, feedback, and information dissemination capacities. All these development, evaluation, management, and monitoring approaches required challenging institutional changes given the agencies' prevailing objectives, procedures, cultures, and contested political environments. Strong leadership, improved communication, and structural changes helped advance the transition (Gifford et al., 2015b).

The strongest administrative changes came with the formation of a dedicated PPP programme office. A PPTA programme assessment completed in 2010 found that the programme, as originally administered by various transportation sub-departments: 1) suffered from fragmented priorities, authority, and accountability; 2) lacked a multi-modal focus; 3) lacked a programmatic approach to its methods, processes, priorities, and funding; and ultimately, 4) demonstrated overly-long project development and implementation. To address these limitations, the report recommended the formation of a separate, multi-modal PPTA programme office that centralised PPP programme ownership, accountability, funding, and responsibility with the focus, funding, expertise, and standardised procedures necessary to support a robust and effective programme (KPMG Infrastructure Advisory, 2010). The resulting Virginia Office of Public-Private Partnerships office (VAP3, originally called the Office of Transportation Public-Private Partnerships, OTP3), was established in 2011. It greatly refocused the state's PPP program, developed a PPP-sensitive organisational culture with PPP-appropriate procedures, and improved public engagement and stakeholder outreach (VAP3, 2014c). Other subnational governments considering new or adapted PPP programmes often solicit guidance from VAP3 staff members. For example, the National Governors Association included the leader of the VAP3 in a fall 2015 showcase on PPPs in the capital of Arkansas. Soon after the current director's appointment in early 2014, a blog post from the widely read *Public Works Financing* characterised the office as "… the most powerful P3 incubator in the country…" (Reinhardt, n.d.).

Accountability and transparency

Since PPP procurement arrangements necessarily transfer infrastructure delivery responsibilities (and often their revenue streams) to private-sector actors, transparency, accountability and competitive procurement procedures are essential for protecting the public interest. Virginia's PPP enabling statutes and their subsequent amendments have endeavoured to provide this protection. First, while PPTA and PPEA (as amended) exempted qualifying facilities from the Virginia Public Procurement Act, they stipulated that responsible public entities develop equivalent procedures consistent with competitive negotiation and competitive sealed bidding. In addition, both acts required that

responsible public entities justify the proposed alternative procurement based on "(i) the probable scope, complexity, or urgency of a project or (ii) risk sharing, added value, an increase in funding, or economic benefit from the project that would not otherwise be available."

Second, since Virginia relies on responsible public entities rather than legislative approval to review, approve, and manage its PPP projects, comprehensive and timely public information disclosures become essential (Rall, Reed, and Farber, 2010: 10, 12; Buxbaum and Ortiz, 2009: 24–27).Virginia's PPP statutes always required financial disclosures from private partners, but several amendments strengthened PPTA's and PPEA's disclosure requirements during the mid-2000s. For example, 2006 and 2007 amendments to both acts require public disclosure of all proposals within ten days of receipt. Interim and comprehensive agreements are made available for thirty-day public comment periods before finalisation, and procurement records for finalised comprehensive agreements are available to the public upon request.

Third, Virginia has strengthened its public PPP review provisions in recent years. In 2007, for example, the state legislature established the Public-Private Partnership Advisory Commission to review PPEA proposals valued between USD 3 million and USD 50 million and to promptly provide recommendations regarding proposed projects' state tax-supported debt, financial impacts, policy concerns, and business terms. Additional disclosure and review by appropriating bodies were also required for agreements involving tax-supported debt, unusual appropriations, or changes in state control. As noted previously, a similar 2015 amendment to PPTA established the Transportation Public-Private Partnership Advisory Committee with representatives from the Commonwealth Transportation Board, the executive branch, and legislative staff to determine whether proposed projects serve the public interest.

Following the proposal review and procurement phases, responsible public entities remain accountable for oversight. At the project level, PPP contractual agreements, including project-specific performance standards, can offer an additional tool for protecting the public interest and producing high-quality PPP facilities ahead of schedule and under budget. Virginia's flexible statutory framework allows for innovative project management and performance measurement systems as negotiated in comprehensive agreements. However, these approaches present challenges in practice. By shifting to new core activities, procurement methods, and relationships to manage innovative, uncertain, and complex PPP delivery mechanisms, public agencies often struggle without clear-cut, measureable results. This is particularly true as outside factors (e.g. public preferences, macroeconomic shifts, political shifts) drive project outcomes (Koelemay, 2015). As a result, while performance measurement offers management benefits, agencies accustomed to traditional procurement can find them difficult to implement for complex PPP projects (Gifford et al., 2015b).

Discussion

Given the US infrastructure market's decentralised governance and ongoing funding limitations, PPP approaches have become increasingly popular as subnational governments search for improved design, procurement, and funding solutions. While the federal government offers several support programmes and thirty-three states allow PPP approaches for transportation infrastructure delivery, challenges remain. With its multi-decade history, Virginia's PPP programme experience offers insights for other subnational governments. Three broad success factors emerge from the preceding case

analysis, suggesting three recommendations for subnational governments developing PPPs.

First, Virginia's experience highlights the importance of developing a flexible and inclusive statutory framework that supports private-sector participation, accountability, and transparency without inviting political interference. Virginia's flexible and inclusive statutory framework, without legislative approval, opens attractive opportunities for public and private partners to formulate best-practice infrastructure delivery to meet the state's needs. While many states impose restrictions on their PPP programmes, Virginia's PPP enabling acts support a state-wide, programmatic approach without restrictions on qualifying proposal types (solicited vs. unsolicited), facility types, partner types, delivery approaches, or financing options. As a result, Virginia's programme presents few barriers to entry for private parties in these respects. In addition, the state's reliance on responsible public entities – rather than the legislature – to review, approve, and manage projects has limited political interference that might otherwise discourage private-sector participation.

Virginia has also developed a range of policies and procedures to preserve accountability and protect the public interest. For example, while PPTA and PPEA exempt qualifying facilities from the Virginia Public Procurement Act, they stipulate that responsible public entities must justify their PPP procurements and develop equivalent procedures consistent with competitive negotiation and competitive sealed bidding. Virginia's PPP statutes also include a range of provisions requiring timely public disclosure and comment periods, independent audits, and review by either the Public-Private Partnership Advisory Commission (PPEA) or the Transportation Public-Private Partnership Advisory Committee (PPTA) to determine whether proposed projects serve the public interest.

Second, not all infrastructure projects represent strong candidates for PPP procurement. Virginia's experience underscores the need to develop a rigorous selection and review process for projects. Under Virginia's careful project selection and review processes, candidate projects must address public needs and PPP proposals must demonstrate superior predicted outcomes compared to traditional public procurement alternatives. As a result, Virginia has developed and completed many PPP projects, but it has also rejected many. The state's willingness to say "no" to inappropriate projects, debt guarantees, and bailouts has done much to limit its financial risks. Nevertheless, given the wide-ranging risks facing PPPs, the state continues to strengthen its PPP review requirements, recently adding provisions for debt review, independent audits, and official findings of public interest.

Finally, Virginia's experience points to the value of developing a dedicated PPP programme office to centralise programme priorities, authority, funding, and processes, and to develop the internal expertise and external advisors needed to review and assess projects. Prior to VAP3's formation, the state's PPP programme lacked cohesive priorities, authority, accountability, and programmatic approaches to its methods, processes, and funding. VAP3's formation as a separate, multi-modal office centralised PPP programme ownership, accountability, funding, and responsibility, and provided the focus, expertise, and standardised procedures necessary to support a robust and effective program. The resulting office greatly refocused the state's PPP programme and developed a vital PPP-sensitive organisational culture with PPP-appropriate procedures. The office also maintains a set of legal, financial and technical capabilities through on-call staff augmentation contracts that provide specialised expertise needed for particular projects.

Table 4.3. Successes and challenges in the Virginia PPP case

Type of challenge	Factors facilitating success	Remaining challenges
Intergovernmental regulatory coherence	Flexible, inclusive statutory framework Limited political interference Virginia Office of Public-Private Partnerships	State and federal environmental regulations (e.g. I-495 Express Lanes) Statutory variation between US states (potential private-sector barrier)
Financial risks	Careful project selection, evaluation, and review	Demand and revenue risk evaluation (e.g. Dulles Greenway, Route 895) User-fee opposition (e.g. Elizabeth River Crossings)
Cross-jurisdictional co-ordination	Consideration of public infrastructure development plans and comments from affected jurisdictions	Stakeholder outreach and engagement (e.g. I-95 Express Lanes)
Administrative capacity	Virginia Office of Public-Private Partnerships	Transitioning bureaucratic tasks, processes, and procedures Stakeholder outreach and engagement
Accountability and transparency	Public-interest requirements Review bodies Public disclosure requirements	Project management, performance measurement, and oversight

Source: Authors' elaboration.

Despite these success factors, Virginia's PPPs still face important challenges (Table 4.3). Environmental regulations complicate already complex projects (e.g. I-495 Express Lanes) and financial risks often prove difficult to predict (e.g. Dulles Greenway, Route 895). In addition, growing public opposition to user fees threatens to discourage future PPP procurements using this revenue source (e.g. Elizabeth River Crossings). Administratively, new infrastructure delivery approaches like PPPs have required difficult transitions to new development, evaluation, management, and monitoring approaches that often clash with prevailing objectives, procedures, and cultures. Public outreach and stakeholder engagement has remained particularly challenging (e.g. Elizabeth River Crossings). Finally, while the state has greatly improved its PPP review and disclosure requirements, robust performance measurement, management, and oversight prove difficult to formulate and implement.

Conclusion

Ultimately, Virginia's ability to develop and adapt its PPP programme over its long history has proved essential to its continued relevance and viability. As the state continues to grapple with different challenges, its statutory flexibility, dedicated PPP office, and continued institutional learning will help its PPP programme evolve to meet the state's developing needs. Alongside FHWA's office of Innovative Programme Delivery, the Build America Transportation Investment Center, and organisations like the National Conference of State Legislatures' (NCSL), the American Association of State Highway and Transportation Officials' (AASHTO), and the National Governors Association (NGA), Virginia's PPP programme offers an ever evolving model to inform other subnational governments pursuing PPP opportunities.

Notes

1. This Virginia case analysis benefitted greatly from research conducted for the article, Gifford, J.L., and M. Transue (2015), "The Evolution of Virginia's Public-Private Partnership Enabling Statutes", *Journal of Corporation Law*. 41: 265-281.
2. Nominal dollars, unless otherwise noted.
3. The most recent draft "pipeline" documents from the Virginia Office of Public-Private Partnerships includes a conceptual project involving exploring the viability of using availability payments as a funding option (Virginia Office of Public-Private Partnerships, 2015f).

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