International Experience on Regional Cooperation in Innovative Policies and Public-Private Partnerships

Presented by:
Art Smith
Chairman, UNECE TOS-PPP
asmith@mainet.com

November 19, 2013

UNECE
Team of Specialists for PPPs

Public-Private Partnerships

- Can be used to achieve environmental improvements and mitigate the effects of climate change
- Can be developed locally, nationally, or regionally
  - Important tool for regional development strategies
- Can introduce new technologies and innovation
- Can promote sustainable development:
  - Sustainability and profitability are not mutually exclusive goals

Vancouver Cogeneration (Landfill to Energy) Case Study

Vancouver Cogeneration Case Study

- The City of Vancouver, British Columbia owns and operates one of the largest landfill sites in Canada. The site serves approximately 900,000 residents and receives approximately 400,000 tons of solid waste annually.
- The site produces landfill gases as a byproduct of waste decomposition, including methane, a greenhouse gas that contributes to global climate change.
- Since 1991, the City collected and burned (flared) the landfill gases to control odors and reduce the gases' environmental impact. This burning created significant heat energy. In 2000, the City began to consider ways to make beneficial use of the landfill gases and heat energy, and to further reduce greenhouse gas emissions, in keeping with Canada's commitment under the Kyoto Protocol.

Vancouver Cogeneration Case Study – cont.

- The City considered building a power plant itself to use the gas. They decided to solicit private proposals in order to evaluate a broader array of project concepts and maximize the economic, environmental, and social benefits to the City.
- The City decided to implement a Public-Private Partnership-based solution. It pursued a competitive tender process under which potential partners could propose their own solutions for the beneficial use of the landfill gas.
- A request for tender was released in January 2001, for a private partner to finance, design, build, own, and operate a beneficial use facility.
- Five varied proposals were received.

Vancouver Cogeneration Case Study – cont.

- Following a detailed and structured proposal evaluation and negotiation process, a 20-year Public-Private Partnership contract, based on the most highly-evaluated proposal, was approved by the City Council in February 2002.
- Under the approved PPP structure, the City continues to operate the landfill, and a 2.9 kilometer pipeline was constructed by the private partner to take the gas from the landfill to a nearby agricultural complex, where they built the cogeneration power plant.

Vancouver Cogeneration Case Study – cont.

- The private partner selected by the City designed, financed and constructed the cogeneration plant, which uses the landfill gas as fuel to generate enough electricity (7.4 MW per year) to supply 4,000 to 5,000 local homes. The power is sold by the private partner to a provincial utility, BC Hydro.
- Proceeds from the sales of power and thermal energy go to the private partner, minus a 10 percent royalty paid to the City.
- Waste heat from the power generation process is recovered as hot water, which is sold by the private partner to a large (32 acre) tomato greenhouse complex adjacent to the plant, where the water is used for heating purposes.

Vancouver Cogeneration Case Study – cont.

- The City of Vancouver makes no payments to the private partner, but guarantees provision of landfill gases for the twenty-year duration of the PPP contract.
- The private partner's investment was approximately $10 million.
- Construction of the power plant was completed in September 2003, and it was operating at full capacity by November of that year. (Initial capacity was 5.55 MW per year, increasing to 7.4 MW per year with the installation of a fourth engine in late 2004.)
- Together, the power plant and greenhouse complex employ 300 people.

Vancouver Cogeneration Case Study – Outcomes

- Instead of paying to flare the gas, the City now receives net revenues of $150,000 per year.
- Using the landfill gases in this manner, rather than burning them, results in further reduction of greenhouse gases, equating to the removal of 6,000 vehicles from Canada's roads.
- New jobs and more available power were created for the greater Vancouver area.

Tala Power (Hydropower/transmission) Case Study

Tala Power Transmission

- North India has experienced a chronic shortage of power, while neighboring Bhutan has extraordinary hydropower potential. This formed the basis of an agreement under which Bhutan constructed a 1,020 MW hydroelectric plant, with power export to India a key factor in the economic rationale for the project.

- Export of the power would require a 1,156 km 400 Kv power line and 20 km of 220 Kv lines. Due to the cost and complexity of this project, the Government of India sought to utilize a PPP.

- The public partner would be Power Grid Corporation of India, a state-owned utility.

Tala Hydropower Plant

Initial Private Sector Interest was Limited

- This would be the first private investment in power transmission in India.
- Indian state electricity boards had poor payment records.
- It is often difficult for private parties to obtain consents and approvals in India.
- The potential for political disputes between India and Bhutan also created risk.

PPP Strategy to Mitigate Risk

- A private company would be formed to execute the project
- The company would be 51% owned by private investors, and 49% by the Power Grid Corporation of India, thus ensuring the Government's commitment to the project
- Management positions would be nominated by each shareholder and the funders:
  - ✓ 4 from the private partner
  - ✓ 4 from Power Grid Corporation of India
  - ✓ 2 additional members appointed by lenders
- A higher than normal tariff would be granted

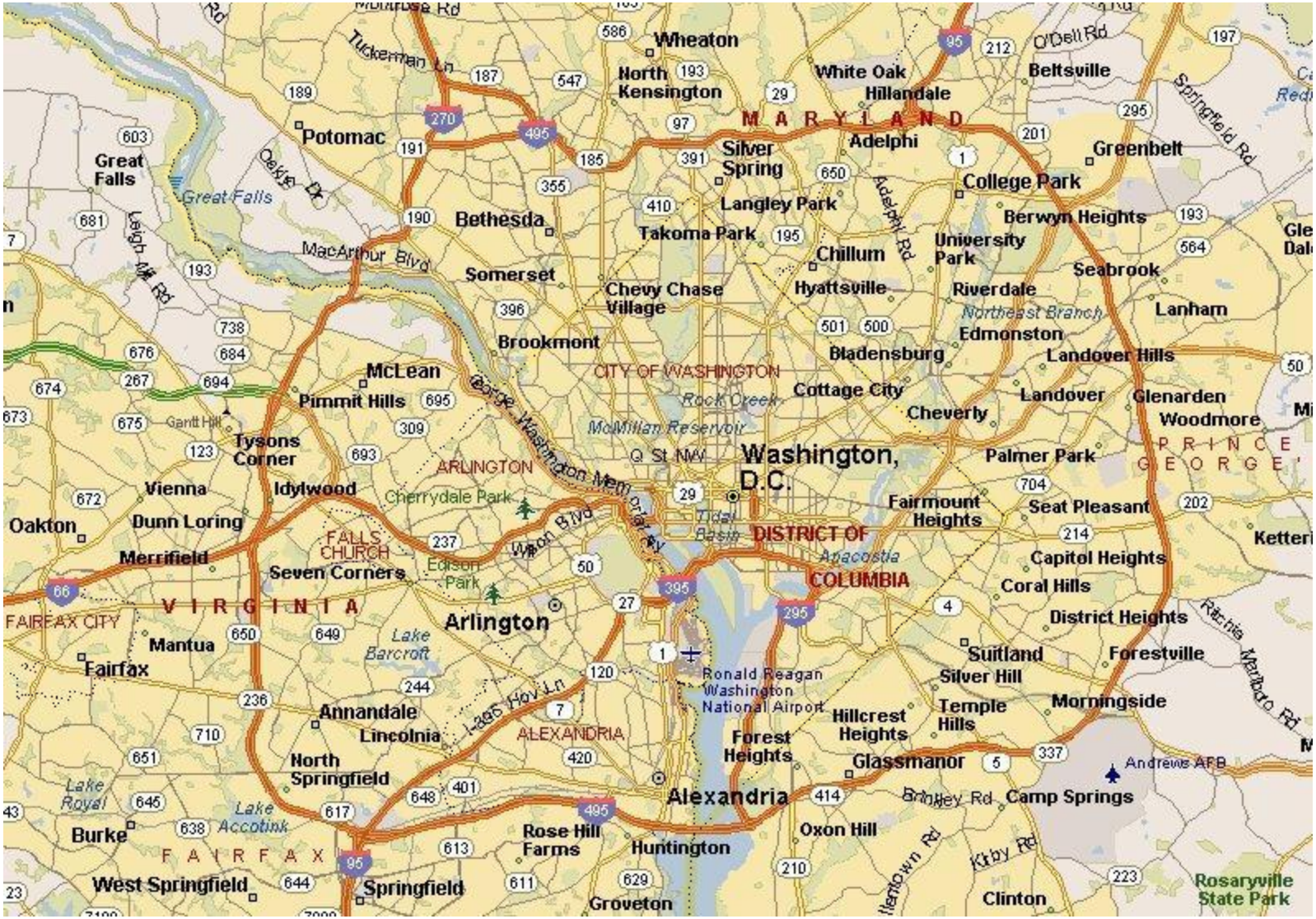
Contract Structure

- A private partner, Tata Power, was selected to be the majority shareholder.
- The PPP legal vehicle, Powerlinks Transmission Limited, was formed.
- Construction cost US$265 million
- Financed 30% equity and 70% debt
- $62 million loan from ADB
- 30 years operation as PPP, followed by transfer of operation to Power Grid Corporation of India
- Project now operational

Clean Technologies in Transport

- Energy efficiency
- Green materials
- Green construction

Washington Beltway (Road) Case Study


Wheaton
North Kensington
White Oak
Hillandale
Beltsville
M A R Y L A N D
Potomac
Great Falls
Great Falls
Silver Spring
Adelphi
Greenbelt
College Park
Langley Park
Takoma Park
Bethesda
Berwyn Heights
University Park
Chillum
Hyattsville
Seabrook
Riverdale
Northeast Branch
Lanham
Edmonston
Bladensburg
Landover Hills
Somerset
Chevy Chase Village
Brookmont
CITY OF WASHINGTON
Rock Creek
Cottage City
Landover
Glenarden
Woodmore
Cheverly
McLean
Pimmit Hills
McMillan Reservoir
Q St NW
Washington, D.C.
Palmer Park
P R I N C E G E O R G E '
Tysons Corner
ARLINGTON
Vienna
Idylwood
Cherrydale Park
Fairmount Heights
Seat Pleasant
Oakton
Dunn Loring
Tidal Basin
DISTRICT OF COLUMBIA
Anacostia
Capitol Heights
Merrifield
FALLS CHURCH
Edison Park
Seven Corners
Coral Hills
V I R G I N I A
FAIREAX CITY
Arlington
District Heights
Mantua
Lake Barcroft
Suitland
Forestville
Fairfax
Ronald Reagan Washington National Airport
Silver Hill
Morningside
Annandale
Lincolnia
ALEXANDRIA
Hillcrest Heights
Temple Hills
Forest Heights
Glassmanor
Andrews AFB
North Springfield
Lake Royal
Lake Accotink
Alexandria
Brinley Rd
Camp Springs
Burke
Rose Hill Farms
Huntington
Oxon Hill
F A I R F A X
West Springfield
Springfield
Groveton
Clinton
Rosaryville State Park

Washington Beltway

- 64 miles (103 km)
- Completed August 1964
- Six to eight lanes
- By 2000, average daily volume on some Beltway segments exceeded 250,000 vehicles per day
- Two Beltway intersections ranked in the Top 20 most congested intersections in the U.S.; one at I-70 receives over 750,000 cars daily.

Improvements Needed

The governments of Virginia, Maryland, and Washington, D.C. agreed that improvements to the Beltway were needed.

Objectives included:

- Increased capacity
- Reduced congestion
- Incentives for carpooling and public transport

The State of Virginia initially proposed the Virginia portion of this expansion as a publicly-funded project, and began planning and public meetings.

Why a PPP?

- Virginia Public-Private Transportation Act of 1995
- Private Sector Innovation
- Over $1 billion in private capital

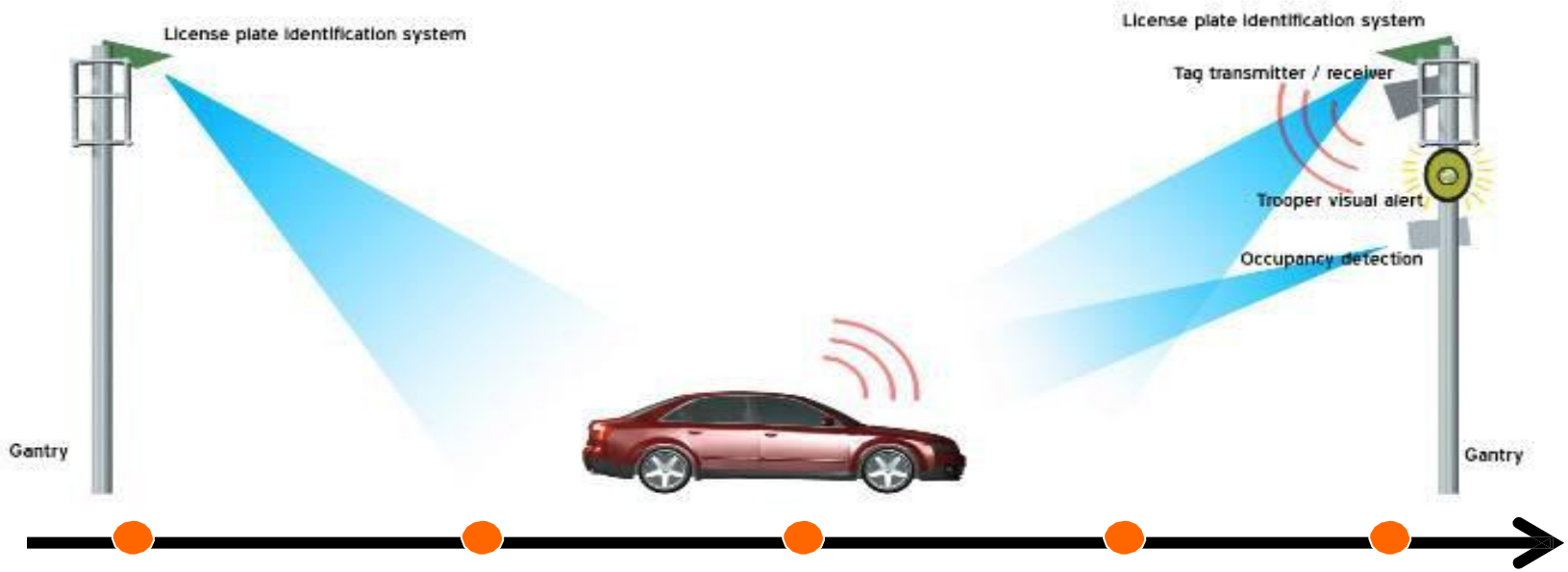
The PPP Concept

- Addition of four, dedicated, congestion-free lanes on which buses and carpools of 3 or more (High Occupancy Vehicles “HOV”) travel free
- Other vehicles can use the new lanes, but must pay a toll
- Toll prices fluctuate based on congestion; required minimum speed of 45 mph (73 kmh)
- The original lanes remain free to all traffic

How Do the 495 Express Lanes Work?

- **Electronic Toll Collection – Open Road**
  - All users must have a transponder
  - No toll booths, stopping or slowing down
  - Electronic readers above the Express lane read transponders with no slowing down
  - Transponders can be ordered online, with a $1 per month maintenance fee

How Do the 495 Express Lanes Work?



User drives under toll gantry at speed limit

Tag transmitter checks for presence of transponder

No transponder? License plate Video detection system captures license plate number and generates a violation

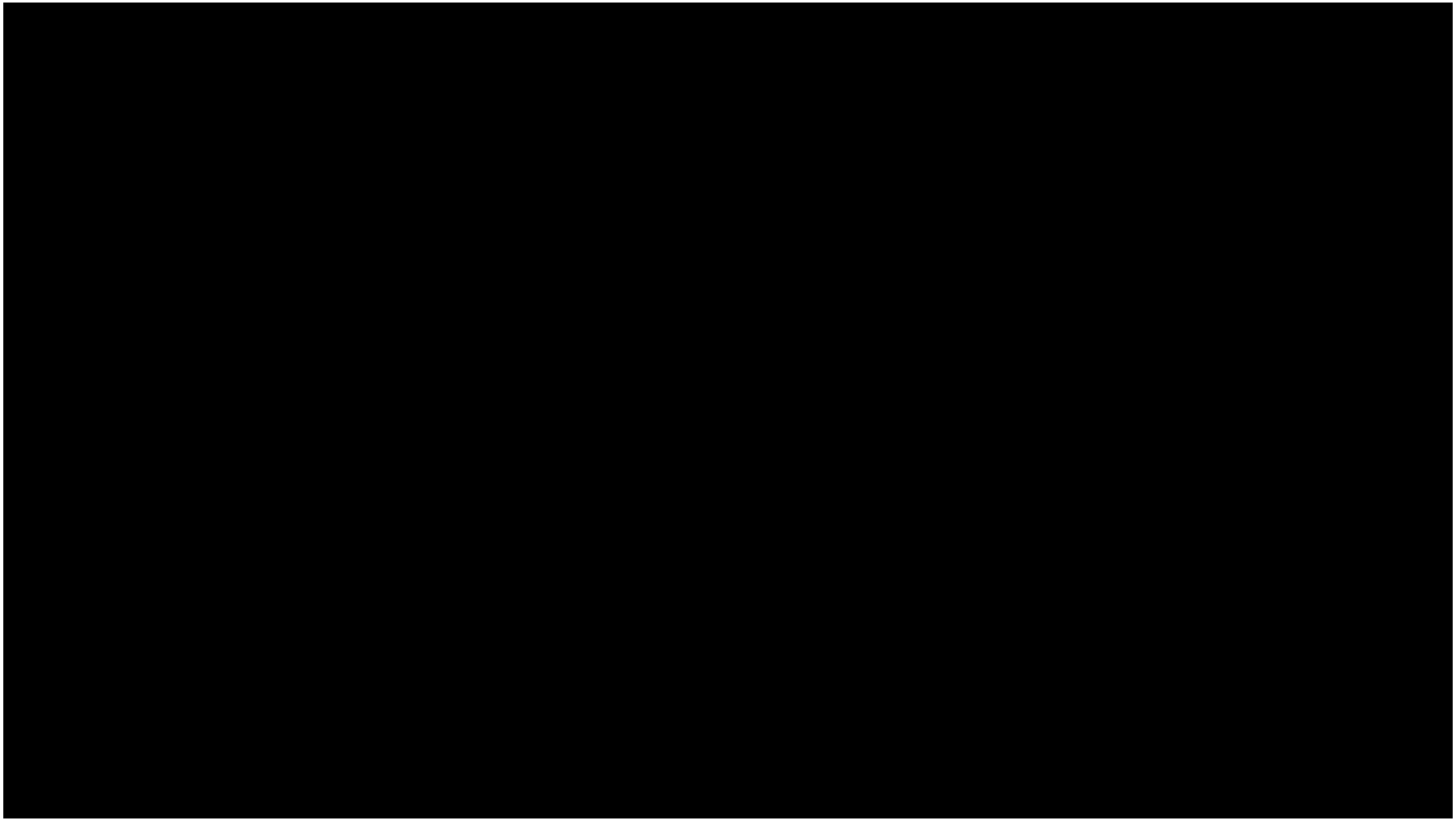
HOV-3+? Occupancy detection technology indicates how many people are in the car, notifies law enforcement to potential violators

Law enforcement officer makes visual assessment and takes appropriate action

How Do the 495 Express Lanes Work?

- Gantries, dynamic signing & video monitoring system allow for:
- Traffic monitoring
- Fast incident management
- Flexible pricing
  - Electronic signs display latest toll rates before you enter Express lanes
  - Tolls are adjusted based on traffic levels to manage number of vehicles in the lanes
  - Motorists know toll well before decision point for entering Express lanes
  - Motorists “lock-in” toll rates – the toll does not change once the vehicle enters the Express lanes.

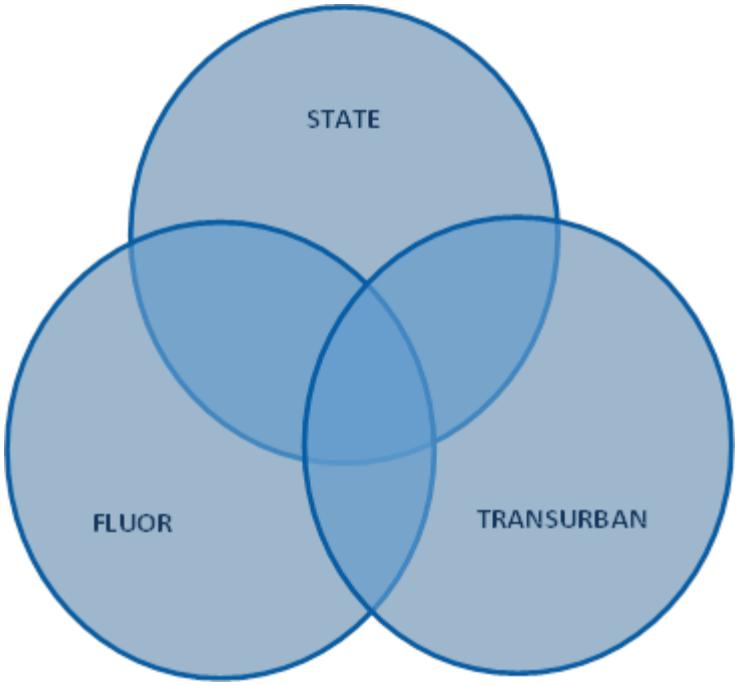
How to Use 495 Express Lanes



Video courtesy https://www.495expresslanes.com/using-the-lanes *and Transurban*

How Were the 495 Express Lanes Funded?

- Total Construction Cost: $1.4 billion for a fixed-price design-build contract
- $409 million Virginia contribution to support HOV use and major capital rehabilitation needs
- $349 million private equity contribution to support operational success and on-time, on-budget project delivery
- $1.1 billion user fees – tolls paid by motorists choosing to use the toll lanes support revenue bonds
  - Private partners liable for all risk if user fee revenues are insufficient to support bonds



Contract Structure

- 80-year term contract that began in December 2007: five years for construction and 75 years of operations and maintenance. Road opened on-time on November 17, 2012.
- The private partners assumed debt risk, construction risks, and costs of operations and maintenance.
- The private partners pay for all maintenance and operations, construction debt, and other expenses of the Express Lanes.
- The private partners must share revenues with the State for use in the corridor in any case where they refinance debt and/or reach a level of profit that exceeds a 7.95% return on investment.
  - The percentage share grows if return on investment grows.
  - The percentage share is based on gross revenue (before all expenses) not on the net available after expenses are paid.

Opportunities for Sustainable PPPs in Central Asia

- Potable Water
- Irrigation
- Wastewater
- Renewable Energy
  - Hydropower
  - Geothermal
  - Solar
  - Wind
- Energy Savings
- Energy Efficiency
- Waste to Energy