



VDOT Roadway Lighting Energy Performance Contract

CTB Workshop | September 2017

Quintin D. Elliott | Chief Deputy Commissioner

Background

❑ VDOT Maintains 50,000 Roadway Lighting Fixtures

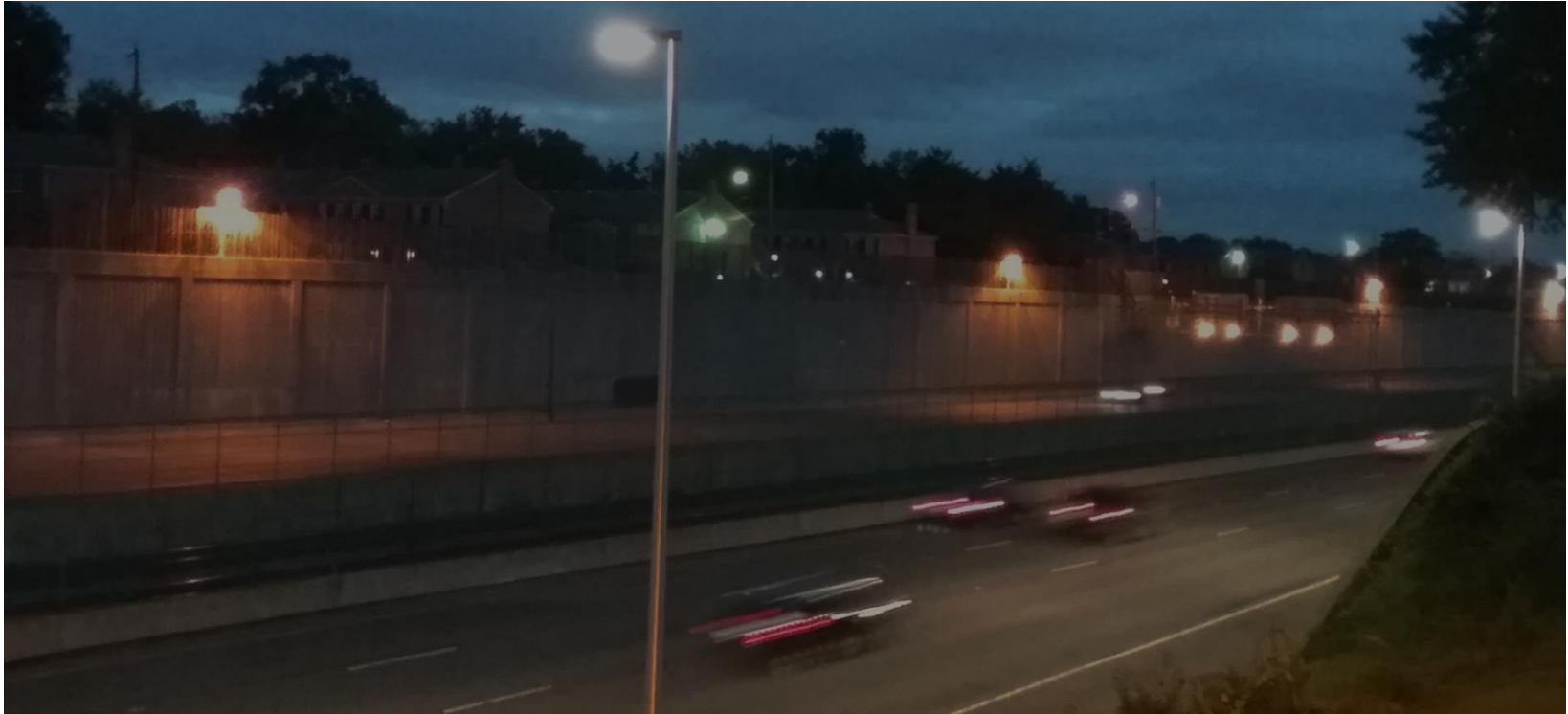
- Majority High Pressure Sodium (HPS) bulbs, 5 years life
- Estimated 10%~25% outages

❑ Proven Light-emitting Diodes (LEDs) Lighting + Controls Technology

- Consumes 50%+ less energy
- Lasts three times longer compared to HPS, 15 years life
- Reduce Operations & Maintenance (O&M costs)
- Improve monitoring & response
- Improved color rendering contributes to safety
- Opportunities for future capabilities: Wi-Fi, veh. detection, CAV

“...no other lighting technology has more energy-saving potential than LED ...” - US Department of Energy

LED Policy Guidance



- **Governor and General Assembly LED Mandates**
 - **Executive Order 31 (issued October 2014)**
 - **2017 Appropriation Act, Chapter 836 Item 80(H)**

VDOT LED Strategic Migration Program

- ❑ **LED luminaires on all future exterior lighting projects**
 - **Highway roadway lighting**
 - **Parking lots** (*District/Residency/Area HQs, Park & Rides, Rest Areas, DMV Weigh Stations*)
 - **Guide sign lighting**
 - **Underbridges and tunnels**
- ❑ **Replace existing lights through attrition & stand-alone projects**
- ❑ **Evaluate Energy Performance Contract in Fredericksburg, Richmond & Hampton Roads Districts**

How EPC/ESCO Works

□ Energy Performance Contract (EPC):

- Energy-savings improvements financed with an available line of credit secured by future energy savings

□ Energy Service Contractor (ESCO):

- Pre-approved design-build general contractor; combines a diagnostic front end & a guaranteed-savings back end

□ ESCO Services:

- Develop package of feasible energy cost-reduction measures
- Annually track & report future energy consumption to DMME
- Provide guaranty; ESCO compensates agency if energy savings fall short

Sister Agency Roles

- ❑ **Department of General Services**

(DGS) – competitively procures ESCO contractors & make available for any government agency use



DEPARTMENT OF
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- ❑ **Department of Mines, Minerals, & Energy (DMME)** – administers the program and advises agencies



- ❑ **Department of Treasury (TRS)** – oversees the Virginia Energy Leasing Program (VELP)



Department of the Treasury
COMMONWEALTH OF VIRGINIA

Example EPC Projects

- ❑ **\$761 million cumulative EPC investment since 2001**
- ❑ **Virginia DMV headquarters renovation**
 - \$6.9 million project to replace chillers, windows, etc.
 - \$284k/year savings and 36% energy reduction
 - Completed October 2014
- ❑ **Other state DOT lighting EPC or P3 projects**
 - Washington State & North Carolina (ESCO)
 - Michigan, Arizona, & District of Columbia (P3)

“Cumulative EPC projects Net Present Value Savings of \$180M+ from avoided costs that exceed debt service during and after repayment of the loan.” - DMME ESCO Program

VDOT EPC Project Timeline

- ❑ **Late 2014/Early 2015:** VDOT seeks proposals from DGS-procured ESCOs; Trane selected above other three responses
- ❑ **Apr 2015:** VDOT and Trane sign \$513,000 MOU for audit of CO facilities, rest areas, major tunnels, and roadway lighting
- ❑ **2015-2017:** ESCO energy audit evaluation, project development, roadway lighting inventory, equipment testing. Selected roadway lighting for a cost-effective EPC project
- ❑ **Aug 2017:** Contract negotiation
- ❑ **Sept 20, 2017:** CTB approval
- ❑ **Sept 30, 2017:** DMME, Treasury, and Governor's office approval for contract award and VELP financing
- ❑ **Nov 2017:** Construction period start
- ❑ **July 2019:** Construction completion
- ❑ **Fall 2034:** Project completion, Guaranty period end

Proposed VDOT EPC Project

□ Scope

- Upgrade 9,627 existing lights in Fredericksburg, Richmond, and Hampton Roads Districts to LED
- Includes highway, park & ride, and rest area lights
- Install Lighting Controls System for monitoring and additional savings

□ Finance - 15-year VELP loan

□ Schedule

- Expected construction completion July 2019
- Energy guaranty contract through 2034



VDOT EPC Project Costs & Benefits

Costs	Cost (Millions)
CONSTRUCTION COSTS **	\$15.9M
Operating Costs (2018-2034):	
--Measurement & Verification (M&V) and Controls	\$1.0M
--Interest Payment	\$3.4M
TOTAL PROJECT COSTS (over 15 years)	\$20.3M

Project Savings (2018-2034)	Savings (Millions)
Total energy savings	\$18.3M
Operations & Maintenance savings	\$9.2M
TOTAL PROJECT SAVINGS (over 15 Years)	\$27.5M

NET PROJECT SAVINGS (\$27.5M-\$20.3M) = \$7.2M

** Include \$500K owner contingency & \$500K Pre-construction energy audit assessment cost