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Operational Document

Jurisdiction and Authority Map

Virginia Operational Technology (OT)/Supervisory Control and Data Acquisition (SCADA)/Industrial Control System (ICS)

By Christian Crumlish, Guillermo Fisher, Colin Jenkel, and Nick Kotakis | November 2026

This authority map was developed by Aspen Policy Academy alumni. They worked with the Commonwealth of Virginia to propose a way to better protect its systems against cyber threats enabled by frontier AI models. This authority map helps Virginia understand who oversees and has control over the operational technology systems they are looking to protect. The full project, including a policy brief explaining the alumni's core recommendations, is available here. Please note that all authors' opinions published here are their own. This publication does not reflect the views of the Aspen Policy Academy or the Aspen Institute.

This chart indicates who owns each vital system, what law governs its cybersecurity, who enforces, and what lever the Commonwealth actually holds. Context rows (shaded) are concentration risks that Virginia cannot act on directly. A glossary of key terms is below.

Sector: *Critical-infrastructure category*	**Example Vital System** *(OT/SCADA/ICS): A representative OT/SCADA/ICS system anchoring the analysis*	**Owner Type:** *Who owns and operates the system*	**Governing Federal Law/Regulation:** *Federal statute/ regulation reaching this system's cybersecurity, if any*	**Governing State Law/ Regulation:** *Virginia statute, standard, or program reaching it*	**Enforcing Regulator:** *Who actually enforces whatever law/reg exists*	**Commonwealth's Available Lever:** *What Virginia can do today given the above*	**Lever Strength:** *Relative rating of how much that lever actually accomplishes*
State government	Executive branch agency systems and agency-owned SCADA	State (executive branch agency)	None general (agency-specific)	Code of Va. § 2.2-2009; COV ITRM SEC530	VITA/CIO (CSRM)	Direct: CIO sets standards, audits, can suspend IT projects and limit investment. Binds state agencies only.	Full
Transportation—traffic	Virginia Department of Transportation (VDOT) traffic signals, VMS, cameras, Smart Traffic Centers (ITS)	State (VDOT)	None (Federal Highway Administration [FHWA] funding; NIST/CISA voluntary)	VITA IT security policy; VDOT agency IT plan	VITA/VDOT	Full: State owns and operates the OT; can mandate and enforce cyber standards outright. Natural starting point.	Full

Sector	Example Vital System	Owner Type	Governing Federal Law/Regulation	Governing State Law/Regulation	Enforcing Regulator	Commonwealth's Available Lever	Lever Strength
Corrections	Prison door control, perimeter, and security systems	State (Department of Corrections)	None sector-specific	VITA policy (state agency)	VITA/DOC	Direct: State-owned, life-safety OT.	Full
State facilities	Building management, HVAC, physical access, backup power	State (Department of General Services/agencies)	None sector-specific	VITA policy (state agency)	VITA/DGS	Direct: Fully state-controlled OT; proving ground for any standard before asking others to adopt.	Full
Maritime/ports	Port of Virginia terminal operating systems, cranes, gate OT	State (Virginia Port Authority)	Maritime Transportation Security Act (US Coast Guard)	VITA policy (state authority)	US Coast Guard (MTSA) and VITA	Direct on the state-owned asset under a federal MTSA overlay. State can act on its own systems.	Strong
Transportation—express lanes	I-495/95/395 dynamic tolling gantries, back-office toll and traffic OT	Private operator (Transurban LLCs) on state ROW	No dedicated federal OT-cyber regime (US Department of Transportation/ FHWA financial oversight only)	Va. Public-Private Transportation Act; Comprehensive Agreements w/ VDOT (to 2087)	VDOT (concession oversight)	Strong but contractual: VDOT can insert or amend cyber terms via the P3 agreement. Bound by existing contract.	Strong

Sector	Example Vital System	Owner Type	Governing Federal Law/Regulation	Governing State Law/Regulation	Enforcing Regulator	Commonwealth's Available Lever	Lever Strength
Public safety/911	PSAP call handling, radio/CAD dispatch systems	Local (cities/counties); state coordinates	None sector-specific (voluntary CISA)	Wireless E-911 Services Board (§ 56-484.14); 20VAC5-425; public body incident-reporting duty	State boards coordinate; VITA/VDEM grants	Strong (indirect): State controls E-911 governance, PSAP accreditation, and cyber grant allocation to locally owned OT.	Strong
Water—drinking	Municipal water treatment plant SCADA and distribution controls	Local/municipal authority/private entity regulated by State Corporation Commission (Aqua VA, VA American Water)	SDWA § 1433 (as amended by AWIA § 2013): RRA and ERP including cyber, systems > 3,300	No state cyber mandate; ODW advisory; 2-hour operational reporting; Fusion Center incident duty	EPA (federal, no state primacy); SCC rates only	Moderate: No enforcement primacy. Levers = ODW technical assistance, incident reporting, SLCGP grants to public systems.	Moderate
Dams/flood—state	Municipal/private impounding-structure gate controls; coastal and stormwater OT	Local/private/ authorities	None (state-regulated track)	Va. Dam Safety Act § 10.1-604 et seq.; Dam Safety Regs (VSWCB)	Virginia DCR/VSWCB	Moderate: DCR permits and certifies physical safety/EAPs but has no explicit cyber mandate. Could add OT/cyber criteria by rule.	Moderate

Sector	Example Vital System	Owner Type	Governing Federal Law/Regulation	Governing State Law/Regulation	Enforcing Regulator	Commonwealth's Available Lever	Lever Strength
Electric—distribution (IOU)	Dominion distribution feeders/distribution management SCADA	Private (IOU)	Gap—below NERC CIP bulk-power threshold	SCC rates/charges/services (Va. Const. Art. IX §2); SB 1239 advisory only	SCC (economic only)	Weak: Economic regulation only; SB 1239 produced advice, not mandate. Would need new statutory cyber authority.	Weak
Electric—cooperative	Member co-op distribution/SCADA	Private (member-owned)	Gap—below NERC CIP threshold	SCC jurisdiction over co-ops (rates/services)	SCC (economic only)	Moderate: SCC reaches co-ops economically; SB 1239 study included them; no cyber mandate. It may be possible to use the SCC's existing convening authority (the SB 1239 model) to ask cooperatives to self-report their participation in US Department of Energy programs and their OT security posture.	Moderate
Water—wastewater	Wastewater treatment SCADA, lift-station controls	Local/municipal/SCC-regulated private entity	None binding (Clean Water Act has no AWIA equivalent; EPA guidance voluntary)	No state cyber mandate; Fusion Center incident duty	None for cyber (EPA voluntary; SCC rates only)	Weak but open: Weakest federal floor, so a state lever could add the most. Currently only voluntary assistance and grants.	Weak

Sector	Example Vital System	Owner Type	Governing Federal Law/Regulation	Governing State Law/Regulation	Enforcing Regulator	Commonwealth's Available Lever	Lever Strength
Transportation—rail	Norfolk Southern/CSX signaling and dispatch OT; VRE/WMATA/ Amtrak control	Private (freight); state/regional/ federal (passenger/transit)	TSA SD 1580-21-01 (freight) and 1582-21-01 (passenger/ transit); pending 2024 Surface Cyber NPRM	None (federally occupied)	TSA (with CISA reporting)	Weak: Federally occupied. State influence indirect via VRE ownership, DRPT funding, coordination.	Weak
Transportation—airports (state/local)	Access-control and airfield OT at Richmond, Norfolk, Newport News	Local/regional airport authorities	49 CFR Part 1542; TSA Joint EA 23-01 (aviation cyber); FAA	No state OT cyber mandate; Virginia Department of Aviation supports	TSA/FAA	Weak: TSA/FAA federal primacy; state can influence but not override.	Weak
Electric—bulk system	Dominion generation and high-voltage transmission SCADA	Private (IOU)	Federal Power Act § 215; NERC CIP standards	SCC economic regulation; SB 1239 advisory	FERC (via NERC/SERC) for CIP; SCC for rates	None (cyber): Binding authority is federal. SCC has economic regulation only; does not enforce CIP.	None/Void
Dams/flood—federal	FERC-licensed hydropower dam spillway/gate ICS	Private/utility (FERC licensees)	FERC Security Program for Hydropower Projects (ICS cyber)	Excluded from state Dam Safety Act	FERC	None: Federally licensed dams are expressly excluded from the state program.	None/Void

Sector	Example Vital System	Owner Type	Governing Federal Law/Regulation	Governing State Law/Regulation	Enforcing Regulator	Commonwealth's Available Lever	Lever Strength
Electric—municipal	Municipal utility distribution/ SCADA	Local (municipal)	Gap—below NERC CIP threshold	Local governing body; note SCC rate-regulated	Local government	None/Void: Outside NERC CIP and outside SCC economic reach. Least-covered power tier.	None/Void
Transportation—airports (Metropolitan Washington Airports Authority—MWAA)	Baggage, access-control, airfield OT at Dulles and Reagan National	Interstate compact authority (MWAA); federally owned, leased	49 CFR Part 1542/1544; TSA Joint EA 23-01; 49 USC 49106/49111	MWAA Compact (Va. Code § 5.1-152 et seq.) establishes independence	TSA/FAA	None/Void: MWAA is independent of Virginia by design; airports federally owned. State holds only concurrent police power.	None/Void
Fuel pipelines (CONTEXT)	Colonial Pipeline fuel-transport OT/SCADA crossing Virginia	Private (interstate pipeline)	TSA Pipeline Security Directives (2021-01/02 series, post-Colonial ransomware); PHMSA safety	None (federally occupied)	TSA (with CISA)	Context/concentration risk: Federally occupied, no state cyber lever. 2021 shutdown is the clearest OT cyber precedent. Advocate/coordinate only.	Context

Sector	Example Vital System	Owner Type	Governing Federal Law/ Regulation	Governing State Law/Regulation	Enforcing Regulator	Commonwealth's Available Lever	Lever Strength
Data centers (CONTEXT)	Loudoun "Data Center Alley"—power, water, and cooling OT beneath the facilities	Private (commercial); depends on Dominion power and local water	None direct for the data center OT	None direct; dependency routes through power (SCC) and local water	None direct (private)	Context/ concentration risk: State carries a huge share of global internet traffic. No direct lever on the data center OT; the honest levers run through the power and water sectors.	Context

Virginia's Lever Menu, by Ownership Tier

The same pattern repeats across sectors: The more directly Virginia owns the asset, the stronger its lever. Read this next to the Authority Map.

Ownership Tier	What Virginia Can Do Today	Mechanism/Legal Basis	Reaches
State agency OT	Mandate and enforce an OT security standard outright; inventory internet-facing devices; require isolation planning	Code of Va. § 2.2-2009; SEC530; executive directive	Direct/Full
State authorities (port, higher education, health)	Direct action on the owned asset, under any federal overlay (e.g., MTSA for ports)	State ownership and agency governance	Direct/Strong
Privately operated on state assets (Express Lanes)	Insert or amend cybersecurity terms, reporting duties, and audit rights in the concession	P3 Comprehensive Agreements (VDOT)	Contractual
Locality-owned OT (water, 911, most dams)	Condition state/federal grant dollars on meeting a baseline; offer shared services; require incident reporting; publish model policy	SLCGP (VITA/VDEM); § 2.2 incident-reporting duty to Fusion Center; E-911 governance	Incentive/Indirect
Investor-owned utilities (Dominion, cooperatives)	Study, convene, and recommend; potentially direct SCC to open a cyber docket (would need new authority)	SCC economic regulation; SB 1239 model	Weak/economic only
Federally occupied (bulk power, rail, aviation, FERC dams, pipelines)	Coordinate, share intelligence, advocate federally; no unilateral cyber mandate	NERC CIP, TSA SDs, FAA/TSA, FERC	None (federal)

Sources

Reference (as it appears in the map)	Source
Maritime Transportation Security Act of 2002	Pub. L. 107-295 (Congress.gov)
VA Public-Private Transportation Act of 1995 (now Title 33.2, Ch. 18)	Code of Virginia, Title 33.2, Chapter 18
Wireless E-911 Services Board, § 56-484.14	Code of Virginia § 56-484.14
SDWA § 1433 / AWIA § 2013 (risk & resilience assessments)	EPA: AWIA Section 2013
VA Dam Safety Act, § 10.1-604 et seq.	Code of Virginia, Title 10.1, Chapter 6, Article 2
TSA SD 1580-21-01 / 1582-21-01 series (rail/transit cyber)	TSA: Security Directives and Emergency Amendments
49 CFR Part 1542 (airport security)	eCFR, Title 49, Part 1542
FERC Security Program for Hydropower Projects (cyber, § 9.0)	FERC: Security Program for Hydropower Projects
MWAA Compact, Va. Code § 5.1-152 et seq.	Code of Virginia, Title 5.1, Chapter 10
TSA Pipeline Security Directives 2021-01/02	Federal Register: Ratification of Security Directive
Federal Power Act § 215	16 U.S.C. § 824o (Cornell LII)

Glossary

Acronym or Term	Definition
Amtrak	National Railroad Passenger Corporation, the federally chartered intercity passenger railroad (operates as Amtrak; not an abbreviation)
Art.	Article (as in "Va. Const. Art. IX, § 2": Constitution of Virginia, Article IX, Section 2)
AWIA	America's Water Infrastructure Act of 2018; Section 2013 amended SDWA § 1433 to require community water systems serving more than 3,300 people to complete risk and resilience assessments (RRAs) and emergency response plans (ERPs), including for cybersecurity
CAD	Computer-aided dispatch: the software 911 centers use to log calls and dispatch responders
CFR	Code of Federal Regulations (as in "49 CFR Part 1542": Title 49, Part 1542)
CIO	Chief Information Officer of the Commonwealth, who heads VITA
CIP	Critical Infrastructure Protection: NERC's mandatory cybersecurity standards for the bulk electric system
CISA	Cybersecurity and Infrastructure Security Agency, US Department of Homeland Security
Colonial Pipeline	Colonial Pipeline Company, operator of the interstate refined-fuel pipeline that crosses Virginia; shut down by a ransomware attack in 2021
Const.	Constitution (as in "Va. Const.": Constitution of Virginia)
COV	Commonwealth of Virginia (as in "COV ITRM SEC530")
CSRM	Commonwealth Security and Risk Management, VITA's information security division

Glossary

Acronym or Term	Definition
CSX	CSX Transportation, a Class I freight railroad operating in Virginia ("CSX" is the company's name, not an abbreviation)
DCR	Virginia Department of Conservation and Recreation, which administers the state Dam Safety Program
DGS	Virginia Department of General Services
DOC	Virginia Department of Corrections
Dominion	Dominion Energy Virginia, the state's largest investor-owned electric utility
DRPT	Virginia Department of Rail and Public Transportation
E-911	Enhanced 911: 911 service that automatically delivers the caller's number and location to the answering center
EA	Emergency Amendment: a TSA security requirement issued to aviation operators (as in "TSA Joint EA 23-01")
EAP	Emergency Action Plan: the plan a regulated dam owner must keep for responding to a dam emergency
EPA	US Environmental Protection Agency
ERP	Emergency response plan, required of community water systems under AWIA § 2013
et seq.	And following: the cited section and the sections after it

Glossary

Acronym or Term	Definition
FAA	Federal Aviation Administration, US Department of Transportation
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration, US Department of Transportation
Fusion Center	Virginia Fusion Center, run by the Virginia State Police: the state's hub for threat intelligence, and the recipient of incident reports from public bodies
HVAC	Heating, ventilation, and air conditioning
I-495/95/395	Interstate highways 495 (the Capital Beltway), 95, and 395 in Northern Virginia, where the Express Lanes run
ICS	Industrial control system: the controllers and networks that run physical processes in plants, pipelines, and utilities
IOU	Investor-owned utility: a privately owned, shareholder-funded utility (e.g., Dominion)
IT	Information technology
ITRM	Information Technology Resource Management: VITA's series of Commonwealth IT policies, standards, and guidelines (as in "COV ITRM SEC530")
ITS	Intelligent transportation systems: traffic signals, sensors, cameras, and message signs that are networked and centrally managed
LLC	Limited liability company

Glossary

Acronym or Term	Definition
MTSA	Maritime Transportation Security Act of 2002, enforced at ports by the US Coast Guard
MWAA	Metropolitan Washington Airports Authority, operator of Dulles International and Reagan National airports
NERC	North American Electric Reliability Corporation, which sets and enforces reliability standards (including CIP) for the bulk power system under FERC oversight
NIST	National Institute of Standards and Technology, US Department of Commerce
NPRM	Notice of proposed rulemaking
ODW	Office of Drinking Water, Virginia Department of Health
OT	Operational technology: hardware and software that monitors and controls physical equipment and processes (as opposed to IT, which handles data)
P3	Public-private partnership
PHMSA	Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation
PSAP	Public safety answering point: the call center that answers 911 calls
Pub. L.	Public Law (as in "Pub. L. 107-295")
ROW	Right-of-way: public land (here, state highway land) on which infrastructure sits

Glossary

Acronym or Term	Definition
RRA	Risk and resilience assessment, required of community water systems under AWIA § 2013
SB 1239	Senate Bill 1239, Virginia General Assembly; in this map, the study of utility cybersecurity it produced, which was advisory and created no mandate
SCADA	Supervisory control and data acquisition: systems that remotely monitor and control equipment spread over a wide area (e.g., pipelines, water distribution, power grids)
SCC	Virginia State Corporation Commission, which regulates utility rates and services
SD	Security Directive: a mandatory TSA security requirement (as in "TSA SD 1580-21-01")
SDWA	Safe Drinking Water Act
SEC530	VITA's Information Security Standard (COV ITRM SEC530), which binds executive branch agencies
SERC	SERC Reliability Corporation, the NERC regional entity whose territory includes Virginia
SLCGP	State and Local Cybersecurity Grant Program: a federal grant program run by CISA and FEMA, administered in Virginia by VITA and VDEM
Transurban	Transurban, the toll-road company whose US subsidiaries operate the Northern Virginia Express Lanes under agreements with VDOT
TSA	Transportation Security Administration, US Department of Homeland Security
U.S.C. / USC	United States Code (as in "16 U.S.C. § 824o")

Glossary

Acronym or Term	Definition
Va. / VA	Virginia (as in "Code of Va.")
VAC	Virginia Administrative Code (as in "20VAC5-425": Title 20, Agency 5 [the SCC], Chapter 425)
VDEM	Virginia Department of Emergency Management
VDOT	Virginia Department of Transportation
VITA	Virginia Information Technologies Agency, the Commonwealth's central IT and cybersecurity agency
VMS	Variable message signs: electronic roadside signs that display changing traffic information
VRE	Virginia Railway Express, the Northern Virginia commuter rail service
VSWCB	Virginia Soil and Water Conservation Board, which issues the state's dam safety regulations
WMATA	Washington Metropolitan Area Transit Authority (Metro)
§	Section (as in "Code of Va. § 2.2-2009")

If you'd like to learn more, see the full project, including a policy brief explaining the alumni's core recommendations, at aspenpolicyacademy.org/project/virginia-operational-systems-cybersecurity-2026.



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