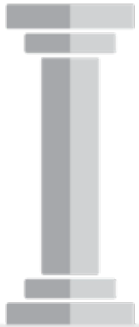
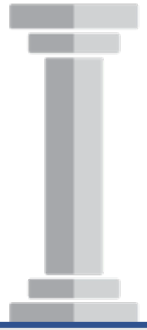
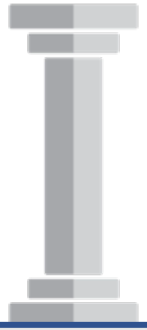
COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

Overview: Development and Monitoring of the Long-term Risk & Opportunity Register, and VTrans Strategic Actions

Jitender Ramchandani
Office of Intermodal Planning and Investment (OIPI)

September 16, 2025

OVERVIEW: VTRANS FOCUS AREAS

CTB Vision, Guiding Principles, Goals and Objectives	Mid-term Needs and Priority Locations (0 – 10 Years)	Long-term Risk & Opportunity Register (20+ Years)	Strategic Actions
			
		Today's Focus	
Presentation		Sept. 2025	Sept. 2025
Action	April 2025	April 2025	Dec. 2025*	Dec. 2025*

VTRANS | VIRGINIA'S TRANSPORTATION PLAN

* If needed

CODE REQUIREMENT

- **Virginia Code § 33.2-353 and 23 CFR § 450.216 require the State's Transportation Plan, VTrans, to cover a 20-year planning horizon.**
  - This VTrans plan must be submitted to the GA and the Governor every four years.
  - The last submission was in December 2021.

- **CTB is meeting the Code requirements by maintaining and monitoring a Long-term Risk and Opportunity Register.**
  - This evaluates the impacts of relevant global macroeconomic factors that are projected to have a measurable effect on Virginia's transportation system.

- **CTB has also identified Strategic Actions to address the impacts of the identified risks and opportunities.**

PURPOSE OF TODAY'S PRESENTATION

- **This presentation provides an overview of the CTB Policy, Development and Monitoring of the Long-term Risk & Opportunity Register, and associated Strategic Actions.**
  - The original policy was adopted in December 2021.

- **The long-term risk and opportunity register policy is designed to be:**
  - Replicable, evidence-based, and non-speculative.
  - Measuring impacts over and above the business-as-usual scenario.
  - Reflects uncertainties by providing three scenarios of impacts.

IDENTIFYING TRENDS

- **The CTB policy identifies four megatrends and ten macrotrends that are likely to impact Virginia's transportation system in the coming decades.**
  - The focus is on "Known Unknowns" – trends that are known, can be measured.
  - The uncertainty around impacts is captured by developing scenarios.
  - Trends must have direct or indirect measurable impact on Virginia's transportation system.
  - Key terms:

MEGATREND

"A large, social, economic, political, environmental or technological change that is slow to form. Once in place, megatrends influence a wide range of activities, processes and perceptions, both in government and in society, **possibly for decades**. They are the underlying forces that drive trends." – European Foresight Forum

MACROTREND

An emerging pattern of change likely to impact state government and require a response.

More than one macrotrends can be associated with a megatrend.

RISK & OPPORTUNITY REGISTER

It "identifies and records the risks facing different areas of business. Identifying risk is a critical step in managing it and the risk and opportunity register allow our organization to **assess the risk in context with our overall strategy** and help record the controls and treatments of those risks." – ISO9001

IDENTIFIED TRENDS

MEGATREND	CLIMATE	TECHNOLOGICAL ADVANCEMENTS	CHANGE IN CONSUMPTION PATTERNS	SOCIO-DEMOGRAPHIC / EMPLOYMENT CHANGES
MACROTREND	Increase in Flooding Risk ▪ Sea-level Rise ▪ Storm Surge ▪ Inland/Riverine Flooding	Adoption of Highly Autonomous Vehicles Adoption of Electric Vehicles Growth in Shared Mobility	Growth in E-commerce Greater Automation of Production and Services	Growth of the Professional Service Industry Increase in Workplace Flexibility Growth of the 65+ Cohort Population and Employment Shift

FORECASTED IMPACTS OF THE IDENTIFIED TRENDS

- **The impacts shown on the right were calculated in 2021.**
- **Staff research and analysis indicate that trends continue to remain relevant to the transportation system; however, the impacts are projected to be different.**
- **Staff is currently calculating the revised impacts.**

	IMPACTS OF VTRANS MACROTRENDS Over and above impacts due to economic growth			WHAT IT MEANS[1]
	Low	Medium	High	
VEHICLE MILES TRAVELED (VMT) INDEX Estimated change in VMT	+4%	+8%	+17%	👎
SHARED MOBILITY INDEX Estimated switchable urban auto Single-Occupancy Vehicle VMT to micromobility + ridesourcing	+9%	+18%	+27%	👍
SAFETY INDEX Estimated change in number of crashes involving fatalities + serious injuries	-26%	-38%	-67%	👍
TAILPIPE EMISSIONS INDEX Estimated change in tailpipe emissions	-3%	-17%	-69%	👍
NUMBER OF AT RISK MILES FROM FLOODING				
Sea Level Rise	900	1,100	1,400	👎
Storm Surge	7,700	13,100	17,100	👎
Inland/Riverine Flooding	17,500	17,900	18,200	👎

[1] Up logo: Desirable impact. Down logo: Undesirable impact.

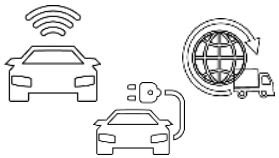
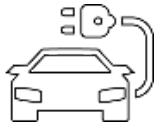
- **The Board's policy preferences regarding the trends and their impacts are captured in the Long-term Risk and Opportunity register. A total of nineteen risks and opportunities were documented in 2021.**

MACROTREND	NATURE	DESCRIPTION
		1. A large number of the state's roadways are at risk of flooding. 2. Several unknown and unquantified flooding risks are present. 3. Impacts of increased flooding risk are disproportionately higher for certain geographic areas and populations.
		4. Proactively eliminate or mitigate identified flooding risks. 5. Increase the state's preparedness to address other macrotrends associated with the climate change megatrend.

 Uncertainty with negative impacts.

 Uncertainty with a positive impact.

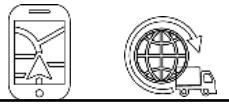
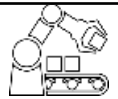
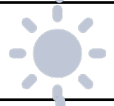
LONG-TERM RISK & OPPORTUNITY REGISTER (CONT.)

MACROTREND	NATURE	DESCRIPTION
		6. Greater wear-and-tear of the transportation system due to increased vehicle miles traveled (VMT) and increase in average vehicle weight.
		7. Improve the state's ability to manage a transportation system with a high number of highly autonomous vehicles. 8. Maximize safety benefits offered by highly autonomous vehicles, especially those with Automated Driving System.
		9. Higher vehicle miles traveled (VMT) for each unit of economic activity compared to the present fleet.
		10. Minimize environmental impacts of the transportation system development

 Uncertainty with negative impacts.

 Uncertainty with a positive impact.

LONG-TERM RISK & OPPORTUNITY REGISTER (CONT.)

MACROTREND	NATURE	DESCRIPTION
		11. Increased curb access conflicts in urbanized areas.
		12. Projected growth in shared mobility (micromobility and TNC/ridesourcing) does not provide measurable transportation system benefits. 13. Benefits of growth in shared mobility are not equally accessible by all areas and population segments.
		14. Utilize shared mobility services to improve accessibility. 15. Improve the state's ability to manage a transportation system with a high number of shared mobility vehicles.
		16. Proactively eliminate or mitigate transportation impacts associated with e-commerce including those related to large warehouse and distribution centers.
		17. Improve the state's ability to proactively manage transportation impacts associated with greater automation of production and services.
		18. Maximize the utilization of workplace flexibility for telework-capable jobs.
		19. Transportation system and services are unable to meet mobility needs of Virginians age 65 and older.

 Uncertainty with negative impacts.

 Uncertainty with a positive impact.



- **The Policy identifies trend trackers to monitor changes and fluctuations associated with the identified trends.**

MACROTREND	VTRANS TREND TRACKERS
	▪ Number of directional miles at risk from sea level rise ▪ Number of directional miles at risk from storm surge ▪ Number of directional miles at risk from inland/riverine flooding ▪ Annual cost of transportation repair due to flooding events
	▪ Market Penetration of Semi-Autonomous (Levels 1 and 2) Vehicles ▪ Attitude and Preferences for Adoption of Semi-Autonomous (Levels 1 and 2) Vehicles ▪ Market Penetration of Highly Autonomous (Levels 3 and 4) Vehicles ▪ Attitude and Preferences for Adoption of Highly Autonomous (Levels 3 and 4) Vehicles
	▪ Number of Electric Vehicles ▪ Market Penetration of Electric Vehicles ▪ Attitude and Preferences for Adoption of Electric Vehicles ▪ Transportation Funding by Funding Source

MONITORING TRENDS (CONT.)

MACROTREND	VTRANS TREND TRACKERS
	▪ Access to Shared Mobility Services ▪ Utilization of Shared Mobility Services by Type
	▪ Number of Warehouse and Distribution Centers ▪ Square Footage of Warehouse and Distribution Centers ▪ Share of E-commerce Sales (Business-to-business, business-to-customers) ▪ Number of Jobs in Goods Movement Dependent Industries
	▪ Number of short-range drone deliveries ▪ Number of long-range drone deliveries
	▪ Share of Professional Services Industry Jobs ▪ Number of Science, Technology, Engineering, and Mathematics (STEM) Jobs
	▪ Number of Workers with Workplace Flexibility ▪ Utilization of Workplace Flexibility
	▪ Number of Virginians Age 65 or higher ▪ Share of Age 65+ Cohort
	▪ VTrans Land Use Vitality Index ▪ Population ▪ Employment ▪ Income

*Based on the VTrans State of Transportation Biennial Survey

STRATEGIC ACTIONS

- **The VTrans planning process culminates with a set of actions, called Strategic Actions, which are developed to:**
  - Advance transportation goals and objectives
  - Address identified transportation needs, and
  - Minimize long-term risks to Virginia's transportation system and be better prepared to maximize benefits from long-term opportunities.

STRATEGIC ACTIONS (CONT.)

1. Collect data (e.g., right-of-way mapping, precipitation, roadway elevation, etc.) to accurately assess flooding risks for state- and locally-maintained roadways that can be used to identify funding needs and prioritize investment.
2. Develop policies, based on robust data collection and analysis, to ensure flooding risks are reflected in transportation asset life cycle and/or transportation project planning processes.
3. Collaborate with state/regional agencies to systematically identify solutions that facilitate consistent and systematic prioritization and support the allocation of state resources to address flooding risks.
4. Evaluate options to gather vehicle automation/capability data for the state's registered vehicle fleet to develop a more complete and accurate assessment of risks and opportunities associated with automated vehicles.
5. Develop a roadmap for implementing foundational digital practices such as digital-as-builts (DABs) and information management processes, etc., for capturing asset information from projects.

STRATEGIC ACTIONS (CONT.)

6. Evaluate and facilitate vehicle-to-infrastructure communications along limited-access highways by the private sector
7. Identify and provide access to the available real-time or up-to-date state transportation asset and operations data in digital formats for use by the public and industry partners as needed to support autonomous vehicle deployment.
8. Identify and develop solutions to address barriers to the installation of electric vehicle charging infrastructure by the private sector.
9. Evaluate and establish sidewalk and curb management best practices for state-owned roadways and promote them for locality-owned roadways.
10. Formalize a process for needs identification and prioritization for the § 33.2-372: Interstate Operations and Enhancement Program, utilizing the transportation planning policies established by the CTB in VTrans.

STRATEGIC ACTIONS (CONT.)

11. Evaluate the performance of selected construction projects from the SMART SCALE, Interstate Operations and Enhancement Program, Virginia Highway Safety Improvement Program, and DRPT's MERIT program to determine if the selected projects are providing the anticipated benefits to support efforts to continue to improve project evaluation criteria and methods.
12. Establish a regular study cycle for Project Pipeline studies, as defined in the CTB Policy for the Prioritization of VTrans Mid-term Needs adopted in March 2021, to include solutions for the most up-to-date Priority 1 and 2 locations.
13. Evaluate the feasibility of and alternatives to a combined dashboard to monitor performance and delivery of projects and programs included in the Six-Year Improvement Program (SYIP).

STRATEGIC ACTIONS (CONT.)

14. Evaluate and, if feasible, integrate the remaining application-based highway and transit capital funding programs and transit operating funding programs administered by OIPI, VDOT, and DRPT into SMART PORTAL to provide one-stop access to the state's funding programs.
15. Identify and clarify the roles and responsibilities of state transportation agencies in emerging areas, such as curb management, micromobility, and shared mobility, to ensure a greater focus.
16. To methodically address items in the 2021 VTrans Risk & Opportunity Register, formalize OIPI's role in supporting and advising the CTB in the conduct of CTB business and the development of a comprehensive transportation policy.

NEXT STEPS

- **October: Review updated mega and macrotrends associated with the Long-term Risk & Opportunity Register and consider staff-recommended or other CTB-proposed updates.**
- **October: Review current Strategic Actions and consider staff-recommended updates or other CTB-proposed updates.**
- **December: If needed, request Board action on the policy updates and submit the plan to the General Assembly and the Office of the Governor.**