COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

VTrans Long-term Risk & Opportunity Register, and Strategic Actions

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PURPOSE OF TODAY'S PRESENTATION

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



Focus of Today's Presentation

Presentation	2023 - April 2025	Sept., Oct. 2025
Action	April 2025	Dec. 2025

VTRANS | VIRGINIA'S TRANSPORTATION PLAN

PURPOSE OF TODAY'S PRESENTATION (*cont.*)

- **This presentation includes:**
  - Transportation Plan requirements
  - Trends impacting transportation
  - Recommended updates to the VTrans Long-term Risk & Opportunity Register
  - Status of 2021 VTrans Strategic Actions and recommended updates for 2025

CODE REQUIREMENT

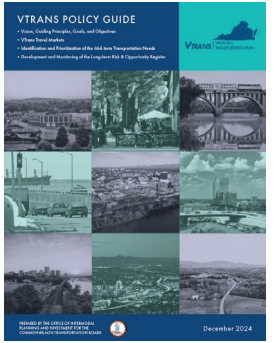
- **Virginia Code § 33.2-353 and 23 CFR § 450.216 require the State's Transportation Plan, VTrans, to cover a 20-year planning horizon.**
  - This VTrans plan must be submitted to the GA and the Governor every four years.
  - The last submission was in December 2021.

- **Commonwealth Transportation Board (CTB) is meeting the Code requirements by maintaining and monitoring a Long-term Risk and Opportunity Register, which has a 20-year planning horizon.**
  - This evaluates the impacts of relevant global macroeconomic factors that are projected to have a measurable effect on Virginia's transportation system.

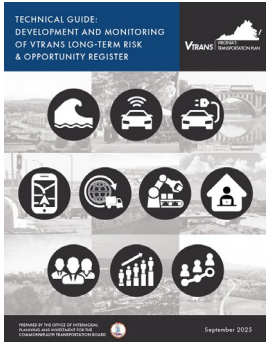
- **CTB has also adopted Strategic Actions to address the impacts of the identified risks and opportunities.**

IDENTIFIED TRENDS

- **The current CTB VTrans policy includes four megatrends and ten macrotrends that are likely to impact Virginia's transportation system in the coming decades.**
  - The trends were identified based on available research and literature review.
  - The focus is on trends that are "Known Unknowns"
    - Trends that are known and expected to have a measurable impact on Virginia's transportation system
    - Trends that have an unknown or uncertain level of impact
  - Three scenarios were developed to capture uncertainty around the impacts of the identified trends.
  - Each scenario identifies **cumulative impacts** over and above the business-as-usual scenario.
- **Staff recommendation:**
  - OIPI does not recommend any changes to the identified megatrends.



VTrans Policy Guide



Technical Guide: Development And Monitoring Of VTrans Long-term Risk & Opportunity Register

IDENTIFIED TRENDS (*cont.*)

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** (e.g. Uber, Lyft, e-Scooters, e-bikes, etc.)	**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**

ESTIMATED ANNUAL IMPACTS OF THE IDENTIFIED TRENDS IN 2050

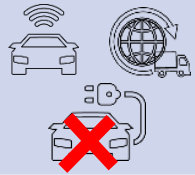
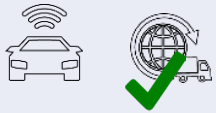
Metrics related to the 2025 VTrans Vision, Goals, Objectives, and Guiding Principles		Annual Impacts by Scenarios in 2050: Impact of VTrans Macrotrends (Over and above impacts due to economic growth)			Desirability
		2025 Low Estimate / (2021 Low Estimate)	2025 Medium Estimate / (2021 Medium Estimate)	2025 High Estimate / (2021 High Estimate)	
Vehicle Miles Traveled (VMT) Index (Estimated change in VMT)		**+1% /** (4%)	**+3% /** (8%)	**+9% /** (17%)	
Shared Mobility Index (Estimated switchable urban single-occupancy auto VMT to micromobility + ridesourcing)		**+1% /** (9%)	**+5% /** (18%)	**+7% /** (27%)	
Safety Index (Estimated change in number of crashes involving fatalities + serious injuries)		**-42% /** (-26%)	**-46% /** (-38%)	**-55% /** (-67%)	
Tailpipe Emissions Index (Estimated change in tailpipe emissions)		**-14% /** (-3%)	**-33% /** (-17%)	**-58% /** (-69%)	
Flooding Risk (Estimated number of at-risk directional roadway miles; rounded to the nearest hundred)	Sea Level Rise	**1,100 /** (900)	**1,300 /** (1,100)	**1,700 /** (1,400)	
	Storm Surge	**8,600 /** (7,7000)	**13,900 /** (13,100)	**17,800 /** (17,100)	
	Inland/Riverine Flooding	**14,000 /** (17,5000)	**14,800 /** (17,900)	**18,000 /** (18,200)	

RECOMMENDED MODIFICATIONS: LONG-TERM RISK & OPPORTUNITY REGISTER

- **The Board's preferences regarding the trends and their impacts are captured in the Long-term Risk and Opportunity Register.**
  - Staff is recommending the removal of the following four of the 19 risks (⚠) and opportunities (☼) documented in 2021.

Associated Macrotrend(s)	Nature	Description of Risk or Opportunity (Rationale for deletion or modification)
	⚠	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.

RECOMMENDED MODIFICATIONS: LONG-TERM RISK & OPPORTUNITY REGISTER (*cont.*)

Associated Macrotrend(s)	Nature	Description of Risk or Opportunity (Rationale for deletion or modification)
	⚠	6. Greater wear-and-tear of the transportation system due to increased vehicle miles traveled (VMT) and an increase in average vehicle weight. (Electric vehicles are no longer estimated to be a meaningful contributing macrotrend for greater wear and tear of the transportation system.)
	☀	~~7. Improve the state's ability to manage a transportation system with a high number of highly autonomous vehicles.~~ (The timeframe for higher fleet penetration of highly autonomous vehicles (Levels 4 and 5) is estimated to be further out in the planning horizon. Additionally, VDOT has completed 2021 VTrans Strategic Action # 4, which helps improve the state's ability to manage highly autonomous vehicles.) 8. Maximize safety benefits offered by highly autonomous vehicles, especially those with an Automated Driving System.
	⚠	9. Higher vehicle miles traveled (VMT) for each unit of economic activity compared to the present fleet. (Growth of e-commerce has been added as a macrotrend influencing higher vehicle miles traveled.)

RECOMMENDED MODIFICATIONS: LONG-TERM RISK & OPPORTUNITY REGISTER (*cont.*)

Associated Macrotrend(s)	Nature	Description of Risk or Opportunity (Rationale for deletion or modification)
	☀	10. Minimize the environmental impacts of the transportation system development.
	⚠	11. Increased curb access conflicts in urbanized areas.
	⚠	12. Projected growth in shared mobility ((e.g. Uber, Lyft, e-Scooters, e-bikes, etc.) does not provide measurable benefits to the transportation system. 13. Benefits of growth in shared mobility are not equally accessible ~~by~~ to 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.~~ (The usage and growth rate of the shared mobility services in Virginia are lower than previously estimated. Additionally, OIPI is currently working on the 2021 VTrans Strategic Action # 9, which helps improve the state's ability to manage shared mobility vehicles.)
	☀	16. Proactively eliminate or mitigate transportation impacts associated with e-commerce, including those related to large warehouse and distribution centers.

RECOMMENDED MODIFICATIONS: LONG-TERM RISK & OPPORTUNITY REGISTER (*cont.*)

Associated Macrotrend(s)	Nature	Description of Risk or Opportunity (Rationale for deletion or modification)
	☼	~~17. Improve the state's ability to proactively manage transportation impacts associated with greater automation of production and services.~~ (This risk has become less relevant from a state transportation entity's perspective.)
	☼	~~18. Maximize the utilization of workplace flexibility for telework-capable jobs.~~ (Virginia's approach focuses on maximizing the economic benefits of collaboration enabled by in-person work.)
	⚠	~~19. The transportation system and services are unable to meet the mobility needs of Virginians age 65 and older.~~ Due to the higher life expectancy and higher growth rate of this population cohort in rural areas, there is a greater need for more mobility options across the state. (The description of the risk has been modified to clarify the intent and the underlying issue.)

RECOMMENDED MODIFICATIONS: LONG-TERM TREND TRACKERS

- **Trend trackers are used to monitor changes and fluctuations associated with the identified trends.**
- **Staff recommendation:**
  - Remove three trend trackers included in the 2021 policy.
  - Add two trend trackers.
  - OIPI to annually report on the identified trend trackers to the CTB.

RECOMMENDED MODIFICATIONS: LONG-TERM TREND TRACKERS (*cont.*)

Macrotrend	VTrans Trend Trackers (Rationale for deletion or modification)
	▪ 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
	▪ Access to Shared Mobility Services ▪ Utilization of Shared Mobility Services by Type
	▪ Number of Warehouses 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~~ (This is no longer a relevant tracker due to higher automation in these industries.)

RECOMMENDED MODIFICATIONS: LONG-TERM TREND TRACKERS (*cont.*)

Macrotrend	VTrans Trend Trackers (Rationale for deletion or modification)	
	~~Number of short-range drone deliveries~~ ~~Number of long-range drone deliveries~~ Percent of plants with robots and percent of employees exposed to robots Capital expenditures for industrial robotic equipment (The recommended trackers are expected to be more relevant and reliable for this macrotrend.)	
	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

STRATEGIC ACTIONS: APPROACH

- **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.
- **Transportation entities under the CTB purview should incorporate these actions in their business plans.**
- **Staff recommendation:**
  - OIPI to annually report the status of the 2025 Strategic Actions to the CTB.

STRATEGIC ACTIONS STATUS AND RECOMMENDATIONS: CLIMATE MEGATREND

2021 VTrans Strategic Action	Responsible Entity(s)	Status (Description)	Recomm-endation
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.	VDOT	Ongoing (VDOT has developed a resiliency plan for data collection.)	Delete
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.	VDOT, DRPT	Underway (VDOT has developed a resiliency plan.)	Retain
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.	VDOT, DRPT	Ongoing (VDOT has developed a resiliency plan.)	Retain

STRATEGIC ACTIONS STATUS AND RECOMMENDATIONS: TECHNOLOGY MEGATREND

2021 VTrans Strategic Action	Responsible Entity(s)	Status (Description)	Recommendation
4. **Evaluate options to gather vehicle automation and 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.	VDOT	Complete (VDOT's Research Council investigated options to estimate.)	Delete
5. **Develop a roadmap for implementing foundational digital practices** such as digital as-builts (DABs) and information management processes for capturing asset information for transportation infrastructure.	VDOT, DRPT	Complete (VDOT and DRPT are making steady progress in implementing through a multi-pronged, phased approach.)	Delete
6. **Evaluate and facilitate desirable deployment of vehicle-to-infrastructure** communications along limited-access highways by the private sector.	VDOT	Underway (VDOT has coordinated and partnered with the private sector.)	Retain

STRATEGIC ACTIONS STATUS AND RECOMMENDATIONS: TECHNOLOGY MEGATREND (*cont.*)

2021 VTrans Strategic Action	Responsible Entity(s)	Status (Description)	Recomm-endation
7. **Evaluate opportunities to 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 to support autonomous vehicle deployment.	VDOT, DRPT	Underway (VDOT has completed the initial evaluation, and both VDOT and DRPT are continuing their evaluations.)	Retain
8. **Identify and develop solutions** to address barriers to the installation of electric vehicle charging infrastructure by the private sector.	OIPI	Underway (OIPI has identified the current barriers.)	Retain
9. **Evaluate and establish sidewalk and curb management best practices** for state-owned roadways and promote them for locality-owned roadways.	OIPI	Underway (OIPI has evaluated the current state of practice and will be forming a working group.)	Retain

STRATEGIC ACTIONS STATUS AND RECOMMENDATIONS: TRANSPORTATION NEEDS

2021 VTrans Strategic Action	Responsible Entity(s)	Status (Description)	Recomm-endation
10. **Formalize a process for comprehensive 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.	OIPI	Complete (CTB has adopted a policy for the administration of the Interstate Operations and Enhancement Program.)	Delete
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 and to support efforts to continue to improve project evaluation criteria and methods.	OIPI	Ongoing (OIPI has completed the initial evaluation of completed SMART SCALE projects.)	Retain
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 VTrans Priority 1 and 2 locations.	OIPI	Complete (OIPI has developed and implemented a regular study cycle.)	Delete

STRATEGIC ACTIONS STATUS AND RECOMMENDATIONS: VTRANS GUIDING PRINCIPLES

2021 VTrans Strategic Action	Responsible Entity(s)	Status (Description)	Recomm-endation
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).	VDOT, DRPT	Complete (The evaluation has found a combined dashboard unfeasible at this time.)	Delete
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 the SMART PORTAL to provide one-stop access to the state's funding programs.	VDOT, DRPT, OIPI	Complete (The evaluation has found integration is unfeasible at this time.)	Delete

STRATEGIC ACTIONS STATUS AND RECOMMENDATIONS: LONG-TERM RISKS & OPPORTUNITIES

2021 VTrans Strategic Action	Responsible Entity(s)	Status (Description)	Recomm-endation
15. **Identify and clarify the roles and responsibilities of the state transportation agencies** related to emerging areas such as curb management, shared mobility, drones, etc., to ensure greater focus.	OIPI	Initiated (OIPI, through VTrans, is conducting a peer review.)	Retain
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 develop a comprehensive transportation policy as required by 2.2-229.	OIPI	Initiated (OIPI will continue to address the items in the 2025 VTrans Risk & Opportunity Register.)	Retain

ACTION ITEMS FOR THE DECEMBER CTB MEETING

- **Request CTB action on the following at the December CTB Meeting:**
  - The 2025 VTrans Long-term Risk & Opportunity Register, based on agreed-upon modifications to the 2021 version and reflective of the Vision, Goals, Objectives, and Guiding Principles adopted in 2025.
  - The 2025 VTrans Strategic Actions, based on agreed-upon modifications to the 2021 version.
  - Direct OIPI to submit the plan, collection of four policies, to the General Assembly and the Office of the Governor.