



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

VTrans Long-term Risk & Opportunity Register - Part 2

Commonwealth Transportation Board Workshop

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October 19, 2021



- Present Draft Policy:
Development and Monitoring of VTrans Long-term Risk & Opportunity Register
 - Review impacts of mega/macrotrends on CTB's Goals
 - Review the Draft Risk & Opportunity Register

DRAFT LONG-TERM POLICY: CONTEXT AND OVERVIEW

1
CTB's Vision, Guiding Principles, Goals and Objectives

2
VTrans Mid-term Needs: Identification and Prioritization

3
VTrans Long-term Risk & Opportunity Register

4
Strategic Actions (Recommendations)



JAN 2020

JAN 2020
MARCH 2021

BY THE END OF 2021

DRAFT LONG-TERM POLICY: PURPOSE

POLICY GUIDE (DRAFT Chapter 6)

A resource for policy makers.

VTRANS POLICY GUIDE

- Vision, Goals, Objectives and Guiding Principles
- Vision Travel System
- Identification and Prioritization of the Mid-term Transportation Needs
- Development and Monitoring of the Long-term Risk and Opportunity Register



REFINED BY THE OFFICE OF INTERMODAL
PLANNING AND INVESTMENT FOR THE
COMMONWEALTH TRANSPORTATION BOARD



DRAFT SEPTEMBER 2021

[Weblink](#)

TECHNICAL GUIDE

A resource for planners,
engineers, and other
professionals interested in the
data sources, processes, and
methods used to implement
the CTB's policies.

TECHNICAL GUIDE: DEVELOPMENT AND MONITORING OF VTRANS LONG-TERM RISK & OPPORTUNITY REGISTER



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COMMONWEALTH TRANSPORTATION BOARD



September 2021

[Weblink](#)

► 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 macrotrend 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

DRAFT LONG-TERM POLICY: FRAMEWORK

STEP 1 IDENTIFY MEGA- & MACROTRENDS

STEP 2 IDENTIFY SURROGATES FOR CTB GOALS

STEP 3 ESTIMATE IMPACTS OF MACROTRENDS ON SURROGATES

STEP 4 DEVELOP VTRANS LONG-TERM RISK
& OPPORTUNITY REGISTER

STEP 5 TRACK MACROTRENDS FOR ANNUAL REPORTING

MEGATREND

CLIMATE CHANGE

MACROTREND



Increase in Flooding Risk

- Sea-level Rise
- Storm Surge
- Inland/Riverine Flooding

TECHNOLOGICAL ADVANCEMENTS



Adoption of Highly Autonomous Vehicles



Adoption of Electric Vehicles



Growth in Shared Mobility

CHANGE IN CONSUMPTION PATTERNS



Growth in E-commerce



Greater Automation of Production and Services

SOCIO-DEMOGRAPHIC / EMPLOYMENT CHANGES



Increase in Workplace Flexibility



Growth of Professional Service Industry



Growth of the 65+ Cohort



Population and Employment Shift

Covered at the September 2021 Workshop

	GOALS	SURROGATES FOR CTB GOALS
	Economic Competitiveness and Prosperity	Vehicle Miles Traveled (VMT) Index
	Accessible and Connected Places	Shared Mobility Index
	Safety for All Users	Safety Index
	Proactive System Management	Roadways At Risk from Flooding
	Healthy Communities & Sustainable Transportation Communities	Tailpipe Emissions Index

➤ Paul Saffo's¹ six rules of forecasting:

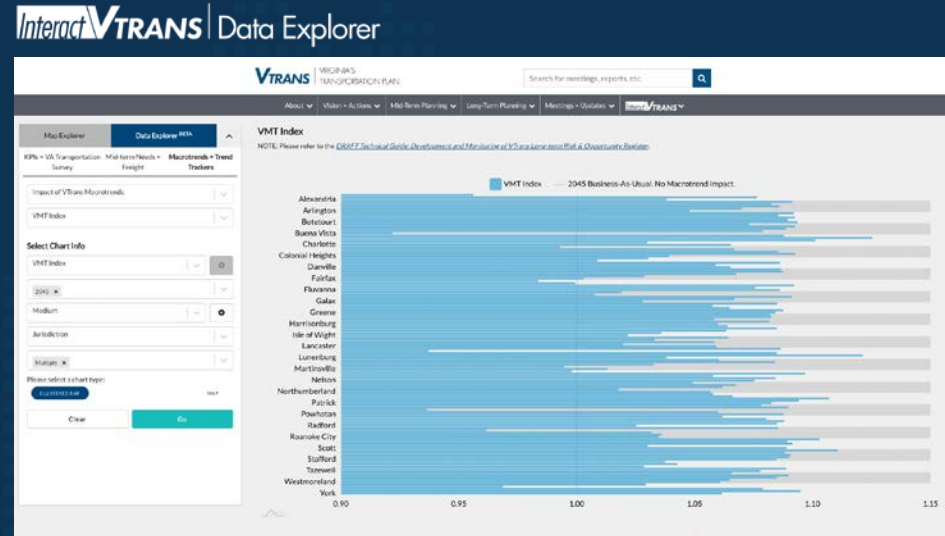
- Rule # 1: Define a Cone of Uncertainty
- Rule # 2: Look for the S Curve
- Rule # 3: Embrace the Things That Don't Fit
- Rule # 4: Hold Strong Opinions Weakly
- Rule # 5: Look Back Twice as Far as You Look Forward
- Rule # 6: Know When Not to Make a Forecast

“The primary goal of forecasting is to identify the full range of possibilities, not a limited set of illusory certainties.”

“The consumer of the forecast must understand enough of the forecast process and logic to make an independent assessment of its quality—and to properly account for the opportunities and risks it presents.”

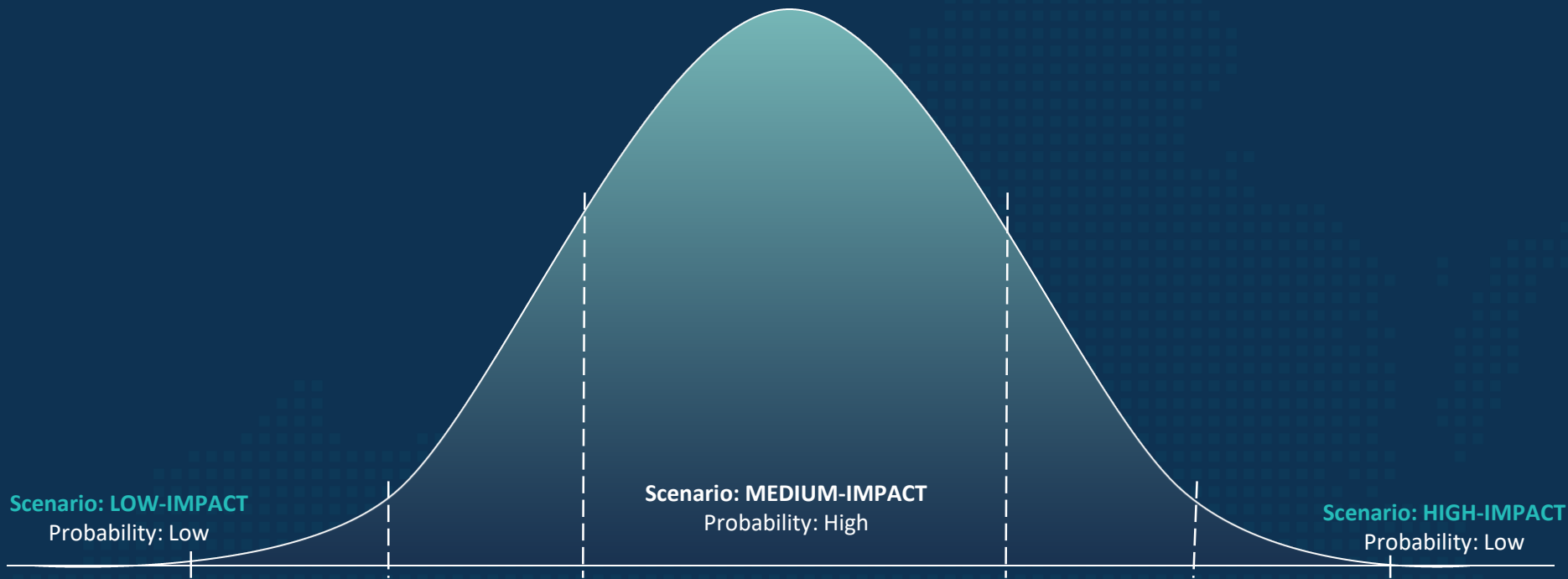
► Sources of Uncertainties:

- Global Policy (Megatrends are global in nature)
 - Scientific
 - Forecast
 - Model
- Annual updates to the Board because -
 “If you must forecast, then forecast often—and be the first one to prove yourself wrong.” – Paul Saffo¹

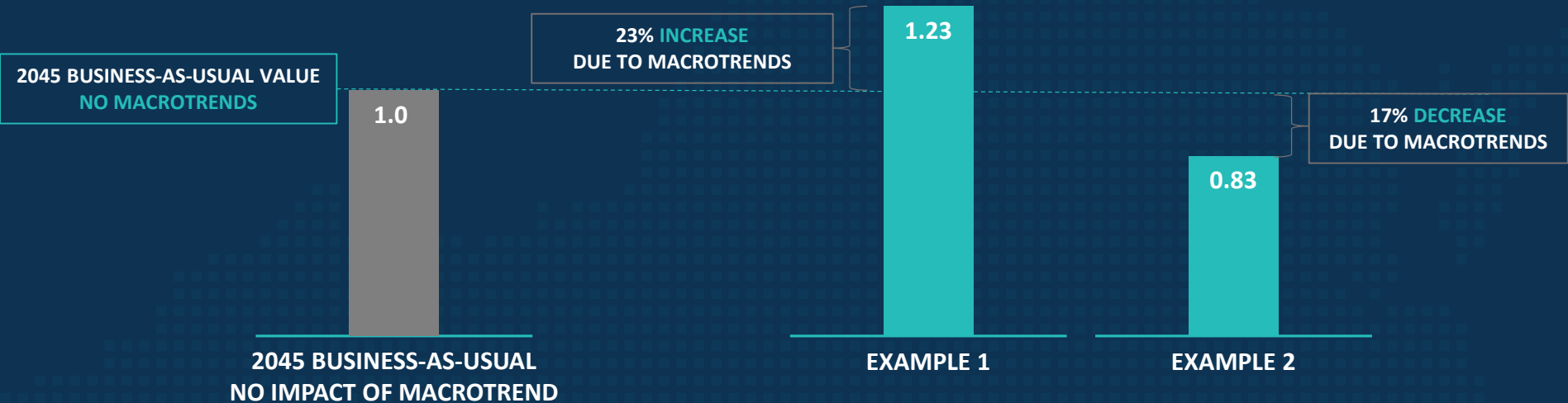


The presentation focuses on the key takeaways; more detailed numbers are available on vtrans.org.

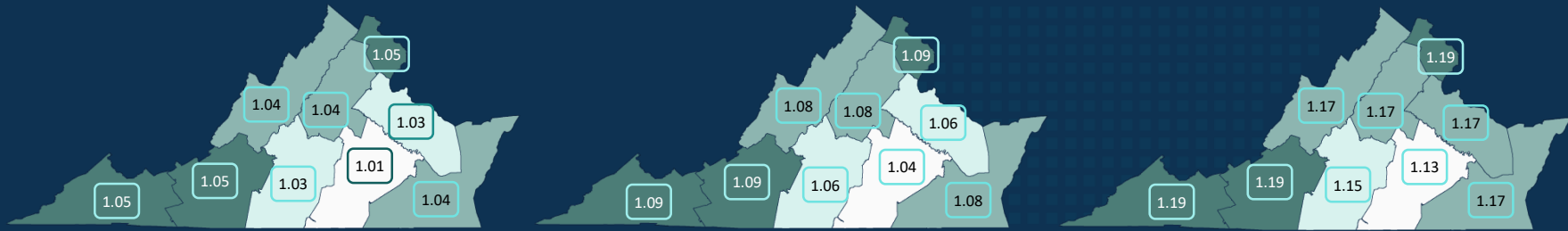
PROBABILITY-BASED SCENARIOS: LOW, MEDIUM, HIGH



- Surrogates for CTB Goals are measured in relation to 1.0 which is 2045-Business-As-Usual Scenario with no impact from Macrotrends.



VEHICLE MILES TRAVELED (VMT) INDEX: ESTIMATED CHANGE IN VMT DUE TO VTRANS MACROTRENDS COMPARED TO THE 2045 BUSINESS-AS-USUAL SCENARIO



+4%

STATEWIDE: LOW IMPACT

+8%

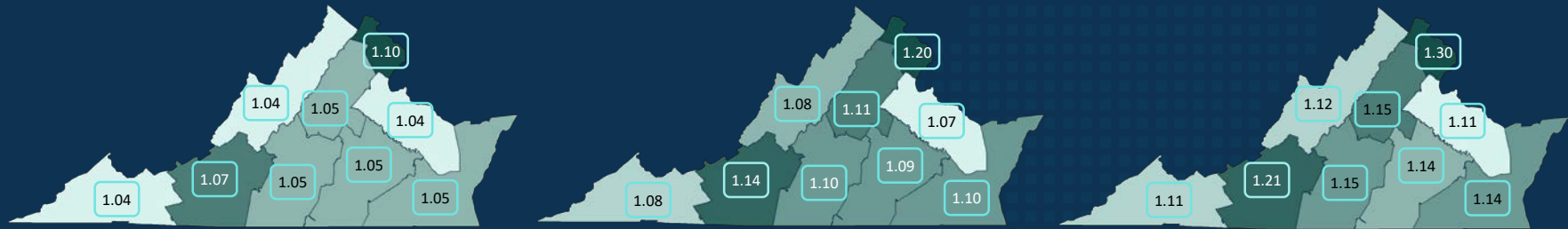
STATEWIDE: MEDIUM IMPACT

+17%

STATEWIDE: HIGH IMPACT



SHARED MOBILITY INDEX: ESTIMATED SWITCHABLE URBAN AUTO SOV VMT TO MICROMOBILITY + RIDESOURCING DUE TO VTRANS MACROTRENDS COMPARED TO THE 2045 BUSINESS-AS-USUAL SCENARIO



+9%

STATEWIDE: LOW IMPACT

+18%

STATEWIDE: MEDIUM IMPACT

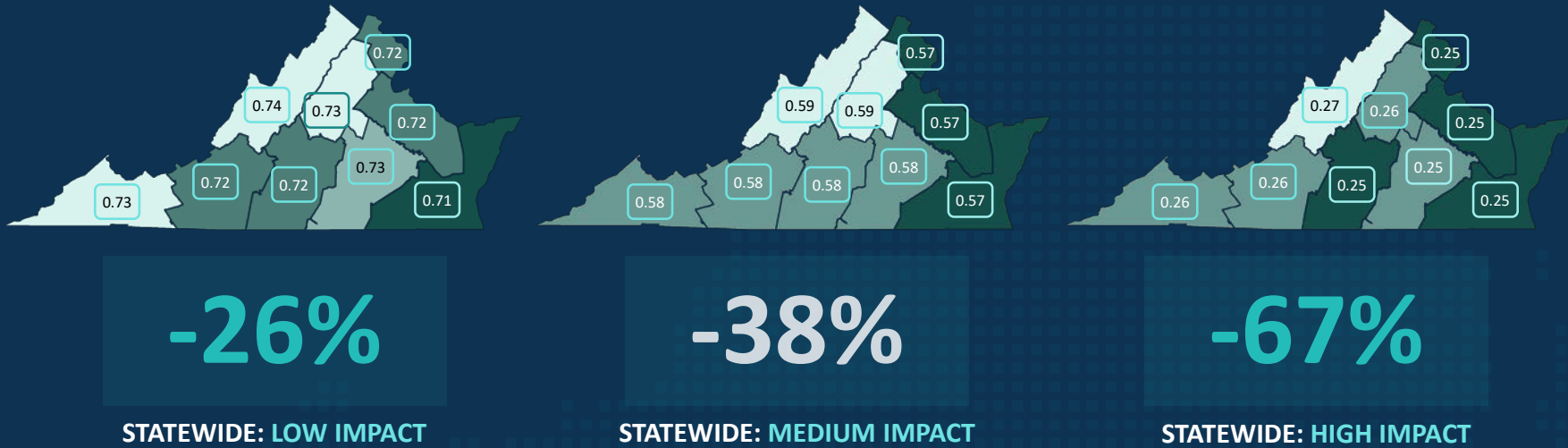
+27%

STATEWIDE: HIGH IMPACT

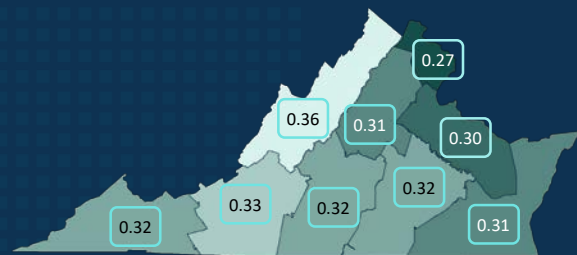
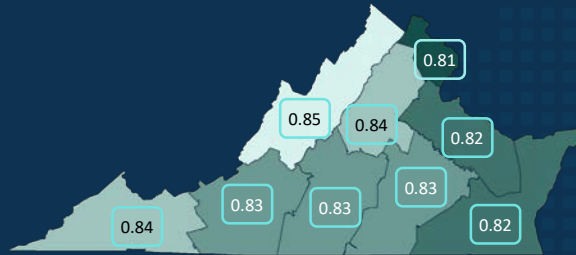
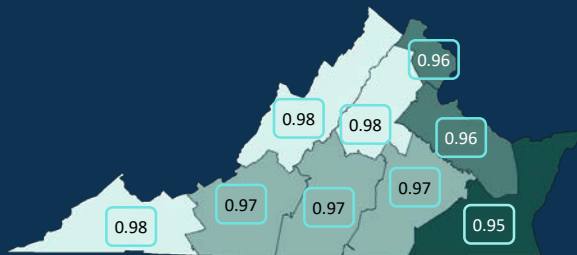


IMPACTS OF MACROTRENDS ON CTB GOAL C SURROGATE

SAFETY INDEX: ESTIMATED CHANGE IN NUMBER OF CRASHES INVOLVING FATALITIES + SERIOUS INJURIES DUE TO VTRANS MACROTRENDS COMPARED TO THE 2045 BUSINESS-AS-USUAL SCENARIO



TAILPIPE EMISSIONS INDEX: ESTIMATED CHANGE IN TAILPIPE EMISSIONS DUE TO VTRANS MACROTRENDS COMPARED TO THE 2045 BUSINESS-AS-USUAL SCENARIOS



-3%

STATEWIDE: LOW IMPACT

-17%

STATEWIDE: MEDIUM IMPACT

-69%

STATEWIDE: HIGH IMPACT



DOWNSIDE RISK

- A 17% VMT increase due to Macrotrends, on top of the VMT growth due to economic expansion, overwhelms Virginia's transportation network in highly population areas and corridors.
 - Virginia is unable to maximize transportation system benefits from a high number of telework capable jobs.
- TNCs /Ridesourcing vehicles merely replace single-occupancy vehicle VMT.
 - Shared mobility services are unable to provide meaningful mobility benefits for populations that can benefit the most.
- Over 20,000 directional roadway miles remain at risk from flooding due to different hazards.

UPSIDE RISK

- Despite the projected VMT growth due to Macrotrends, technological advancements allow Virginia to reduce the number of crashes involving fatalities and serious injuries by as much as 67%.
- Despite the projected VMT growth due to Macrotrends, Virginia is able to reduce tailpipe emissions by as much as 69%.






- Risks and opportunities are identified utilizing the following criteria and based on estimated impacts (Step 3) of Macrotrends on CTB Goals.
 - Strategic in nature
 - Manageable in number
 - Level of detail suitable for policy-makers and executives
 - Most importantly based on [Step 3](#) evidence that is measurable, replicable, and with an ability to monitor



- ⚠ Large number of roadways at-risk from flooding
- ⚠ Presence of unknown and unquantified flooding risks
- ⚠ Disproportionate flooding impacts on certain areas and populations
- ⚠ Higher rate of wear-and-tear on the transportation system
- ⚠ Increased curb access conflicts in urbanized areas
- ⚠ Insignificant (transportation system) benefits from shared mobility
- ⚠ Inequitable distribution of shared mobility benefits
- ⚠ Inability to meet mobility needs of Virginians age 65 and older






- ☀ Eliminate or mitigate identified flooding risks
- ☀ Increase state's preparedness to address other climate-related macrotrends
- ☀ Improve ability to manage high number of highly autonomous vehicles
- ☀ Maximize safety benefits offered by highly autonomous vehicles
- ☀ Significantly reduce tailpipe emissions
- ☀ Utilize shared mobility services to improve accessibility
- ☀ Improve ability to manage shared mobility vehicles and services
- ☀ Proactively mitigate transportation impacts of automation and large warehouse/distribution centers
- ☀ Maximize utilization of workplace flexibility for telework capable jobs

OPI will provide annual updates to the Board utilizing the following **VTrans Trend Trackers**.

MACROTREND	VTRANS TREND TRACKERS
	<ul style="list-style-type: none"> ▪ 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
	<ul style="list-style-type: none"> ▪ Market Penetration of Highly Autonomous Vehicles* ▪ Attitude and Preferences for Adoption of Highly Autonomous Vehicles*
	<ul style="list-style-type: none"> ▪ Market Penetration of Electric Vehicles* ▪ Attitude and Preferences for Adoption of Electric Vehicles* ▪ Transportation Revenue by Revenue Source ▪ Greenhouse Gas (GHG) Emissions
	<ul style="list-style-type: none"> ▪ Access to Shared Mobility Services* ▪ Utilization of Shared Mobility Services by Type*
	<ul style="list-style-type: none"> ▪ Number of Warehouse and Distribution Centers ▪ Square Footage of Warehouse and Distribution Centers ▪ Share of E-commerce Sales (business-to-business, business-to-customers)

*Based on the VTrans State of Transportation Biennial Survey

OIPI will provide annual updates to the Board utilizing the following **VTrans Trend Trackers**.

MACROTREND	VTRANS TREND TRACKERS
	<ul style="list-style-type: none"> ▪ Number of short-range and long-range drone deliveries ▪ Number of last-mile robotic deliveries ▪ Value output of 3D Printing
	<ul style="list-style-type: none"> ▪ Number of Workers with Workplace Flexibility* ▪ Utilization of Workplace Flexibility*
	<ul style="list-style-type: none"> ▪ Job Share of Professional + Technical Services Industry
	<ul style="list-style-type: none"> ▪ Number of Virginians Age 65 or older ▪ Share of Age 65+ Cohort
	<ul style="list-style-type: none"> ▪ VTrans Land Use Vitality (LUV) Index ▪ Population ▪ Employment ▪ Income

*Based on the VTrans State of Transportation Biennial Survey

NEXT STEPS

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NEXT STEPS

➤ November

- Gather CTB input on VTrans Strategic Actions
- Conduct outreach and engagement

➤ December: Request CTB Action on:

- Draft Policy for the Development and Monitoring of VTrans Long-term Risk & Opportunity Register
- VTrans Strategic Actions
- Document synthesizing CTB-adopted policies for the **Governor and the General Assembly**