VTrans 2040 Scenario Testing

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How we look at Future Scenarios

Technology is changing fast, influencing transportation in many ways and combining with demographic trends to reshape travel behavior. These trends challenge our ability to predict transportation needs and solutions in the distant future. VTrans2040 has two components – the VTrans Vision Plan and the VTrans Multimodal Transportation Plan (VMTP). Through an interactive process working with stakeholders and applying innovative analytics, the VMTP identified the projected Transportation Needs for 2025. The time frame for Transportation Needs is relatively short – 10 years – in order to get a closer understanding of what the near- and mid-term future may look like. We recognize that the uncertainty of the longer term future – 25 years and more – could influence our future Needs in potentially dramatic ways. In order to analyze broad potential impacts from local and global trends, a scenario testing process will be conducted to inform long term planning by examining future outcomes of alternative assumptions about the future. Shown below are the basic "drivers" of future change that will be analyzed for their potential impact on transportation investment and policy. We want your input on the relative importance – the potential to impact transportation – and also the relative uncertainty of each of these drivers to our scenario testing process.

VTrans2040 Scenario Testing Approach

DRIVERS
What drives change?
the big change agents
e.g. demographic, economic and technological change

SCENARIOS
What could the future look like?
a series of big picture alternate futures
e.g. The Great Recession Part II, or Triumph of Technology

INPUTS
What variables will change transportation?
the variables that influence transportaion outcomes
e.g. per capita VMT, travel behavior, urbanization

OUTPUTS
What transportation outcomes will most influence our policies?
the variables that drive policy shifts
e.g. mode share, costs, throughput

POLICIES
How will outcomes influence our policy options?
the big picture policy levers that guide investment
e.g. investments in expansion, preservation and technology

What Drives our Future?

VTrans 2040 included a detailed study of the major trends that could shape Virginia's transportation future – global, national and local. From this broad survey of trends, the following drivers will potentially have the greatest impact on how we plan for and invest in our future transportation system.

Look carefully at each potential driving trend and give us your input on how important this is in shaping our future transportation needs, as well as how you feel about the relative uncertainty of this driving trend. Your input will inform the next phase of analysis and the testing of 2040 scenarios based on each of these drivers of future change.

DRIVERS
(What drives change globally)

TRANSPORTATION OUTCOMES
(How global change can affect transportation)

- DEMOGRAPHIC → DEMAND/BEHAVIOR
- ECONOMIC → USER COST
- TECHNOLOGICAL → OPERATIONS / PERFORMANCE

What will drive our future Transportation Needs?

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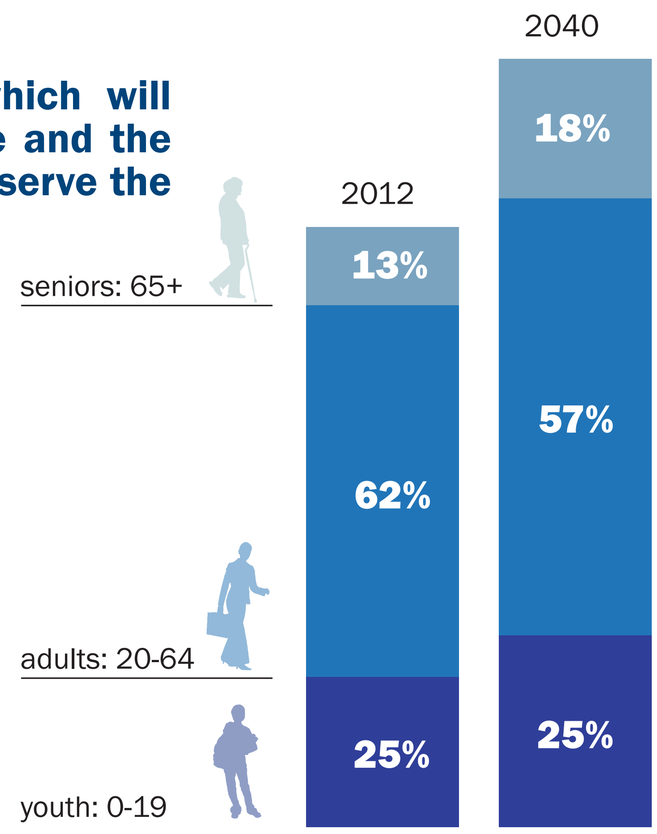
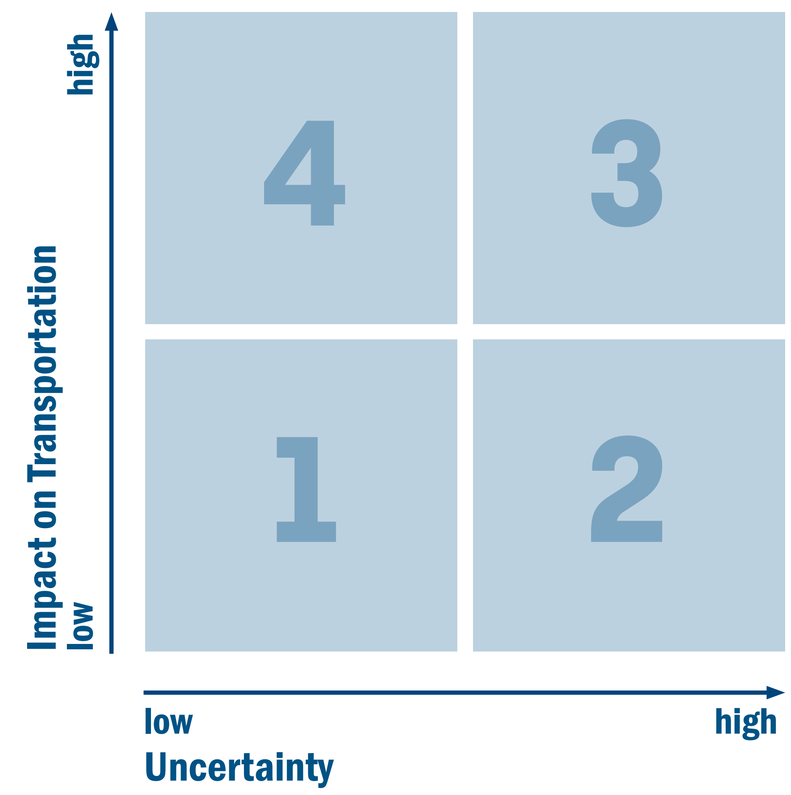
DEMOGRAPHIC/SOCIAL

The Aging Population

Virginia's population is growing and aging, which will influence the way Virginians travel in the future and the types of transportation infrastructure needed to serve the future population.

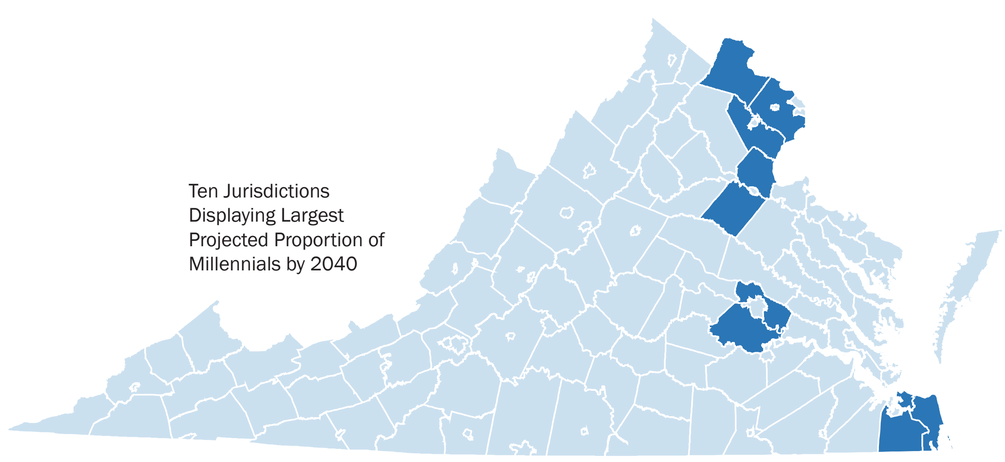


Place one green dot in the quadrant that you feel best defines this driver:

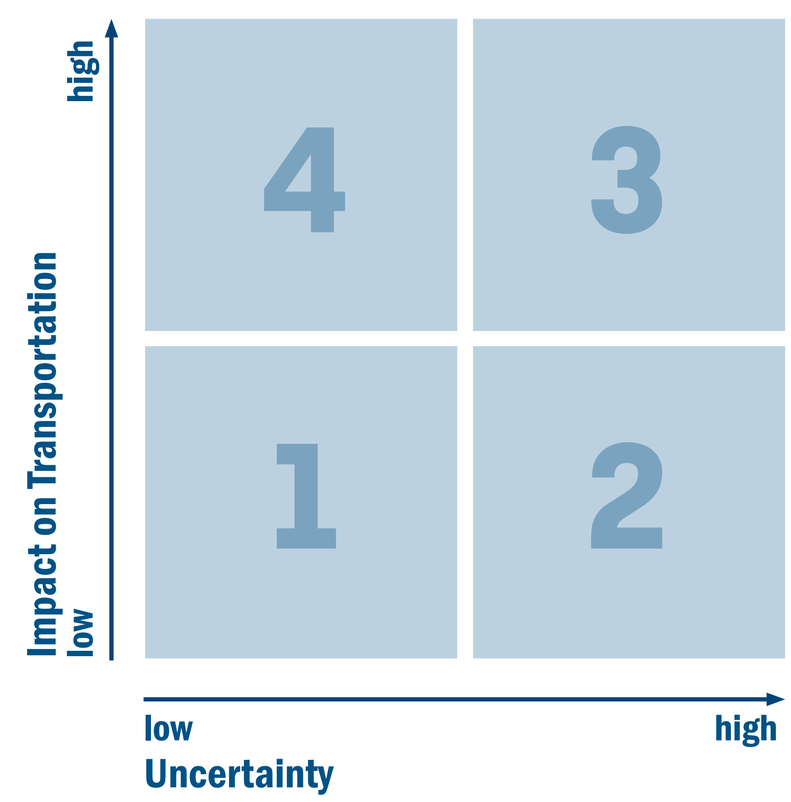


The Battle for Millennial Workers

Millennials (aged 20-35) will be the core workforce in the future. Virginia's high-output industries will be high-tech and knowledge-based, and will rely heavily on skilled Millennials.

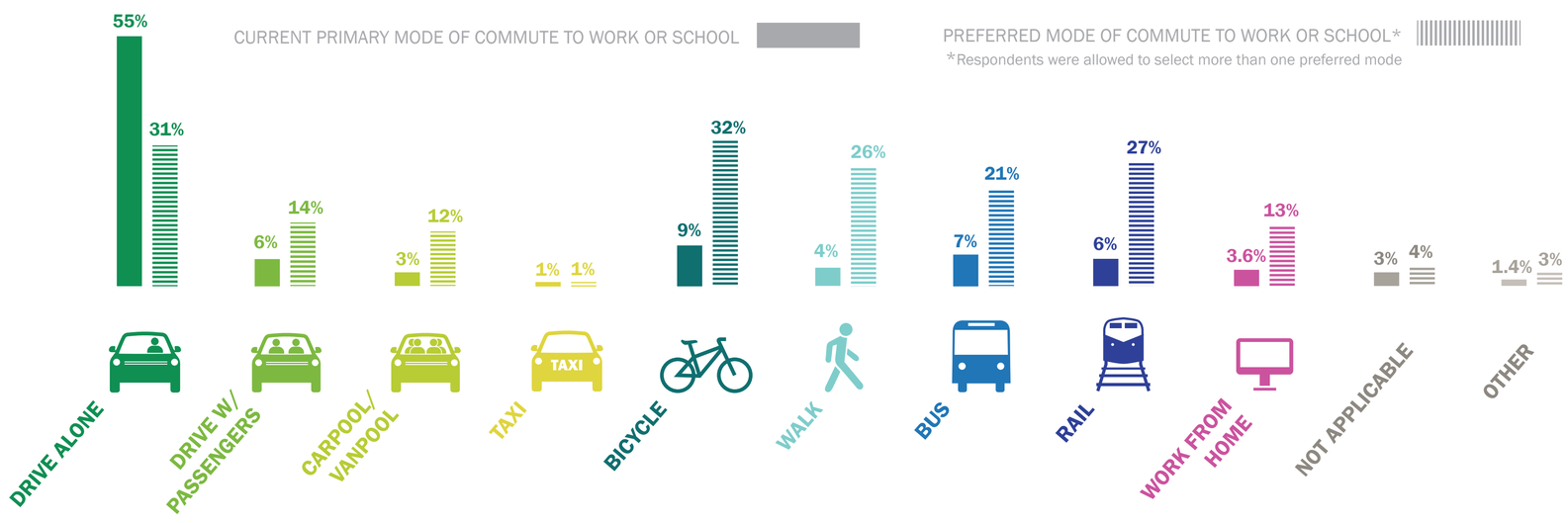


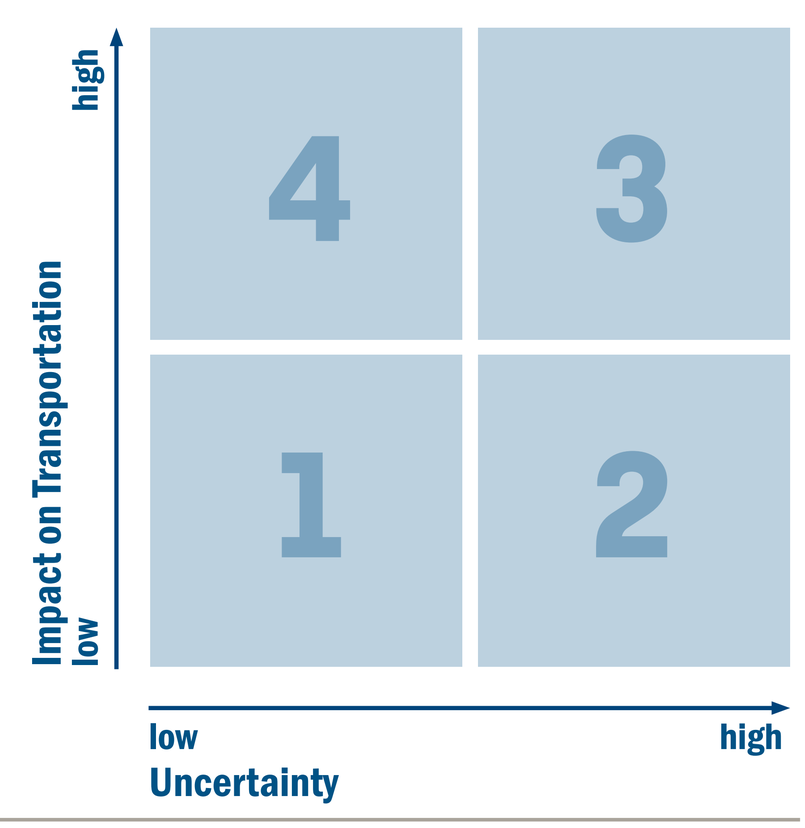
Weldon Cooper Center for Public Service, 2012



Changing Travel Preferences

The areas of the state with the highest shares of bicycle, walking, and transit travel are the same ones forecasted to attract the most high-income jobs and Millennial workers.





Office of INTERMODAL Planning and Investment

LOCAL / GLOBAL / MOBILE / A CONNECTED COMMONWEALTH

ANALYSIS OF TRENDS

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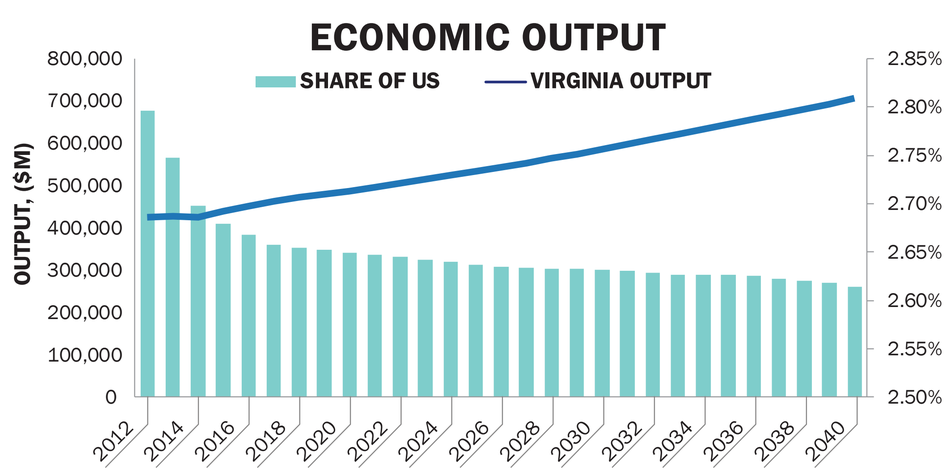
ECONOMIC

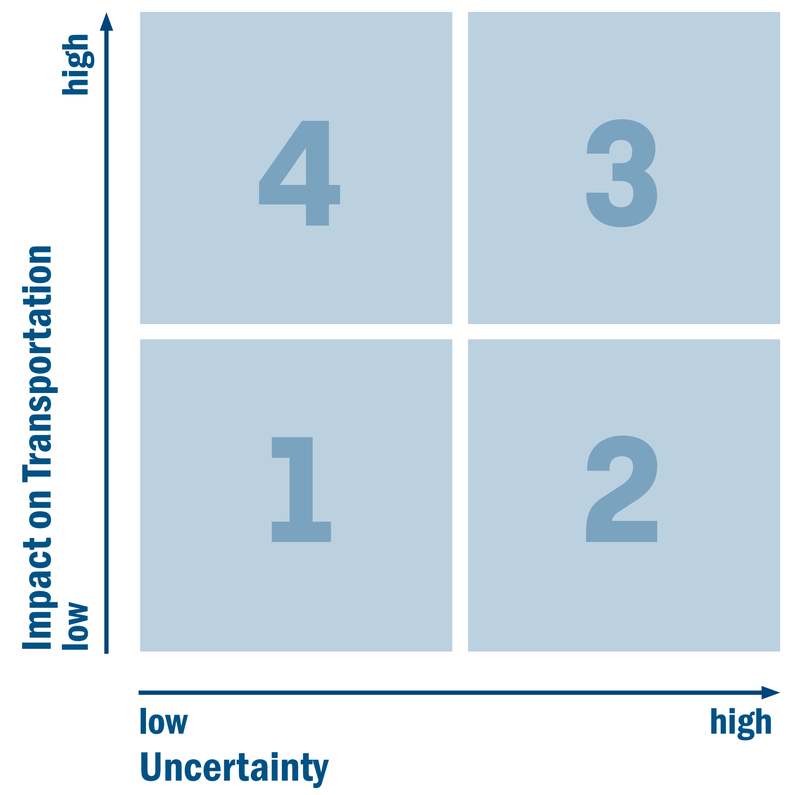
Virginia's Share of Growth

Virginia's share of total US economic output is forecasted to decline. This heightens the urgency of providing high-quality transportation that attracts first-class companies, entrepreneurs, and workers.



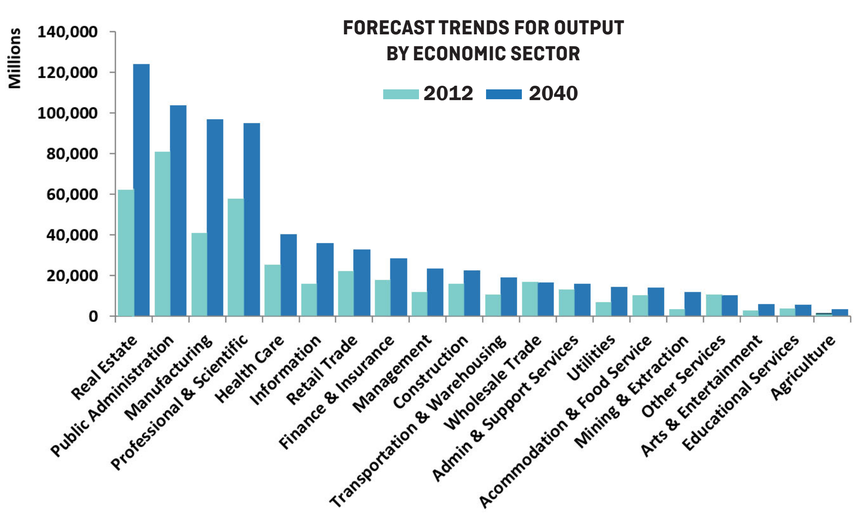
Virginia Economic Output and Share of U.S. Economic Output from 2012 to 2040 (millions of constant dollars)
Source: Moody's Economy.com data.

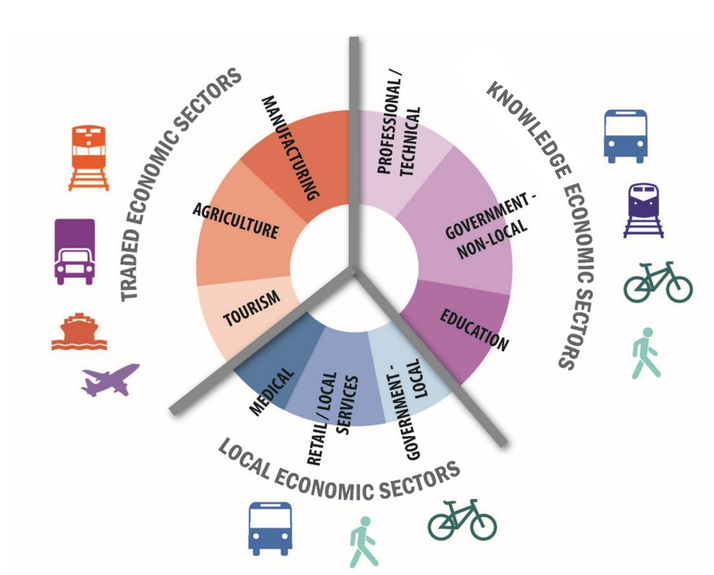
Place one green dot in the quadrant that you feel best defines this driver:

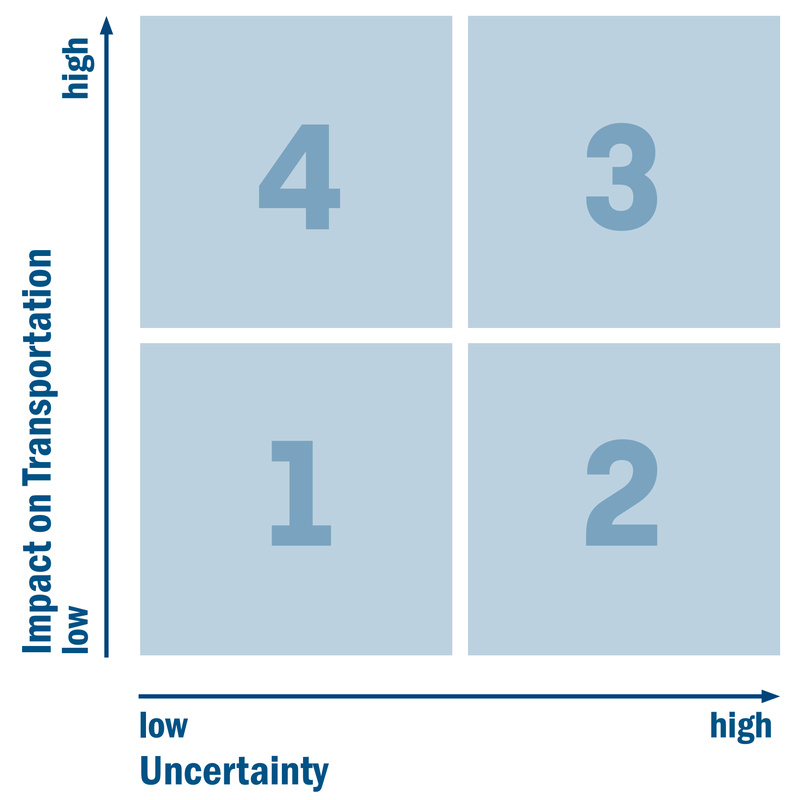


Growth in Knowledge-based Industries

Growth in knowledge-based industries is projected through 2040. For the Professional Services sector, a near 50% increase in output ais projected. As the economy becomes more knowledge-based, demand will increase for non-auto modes of transportation.

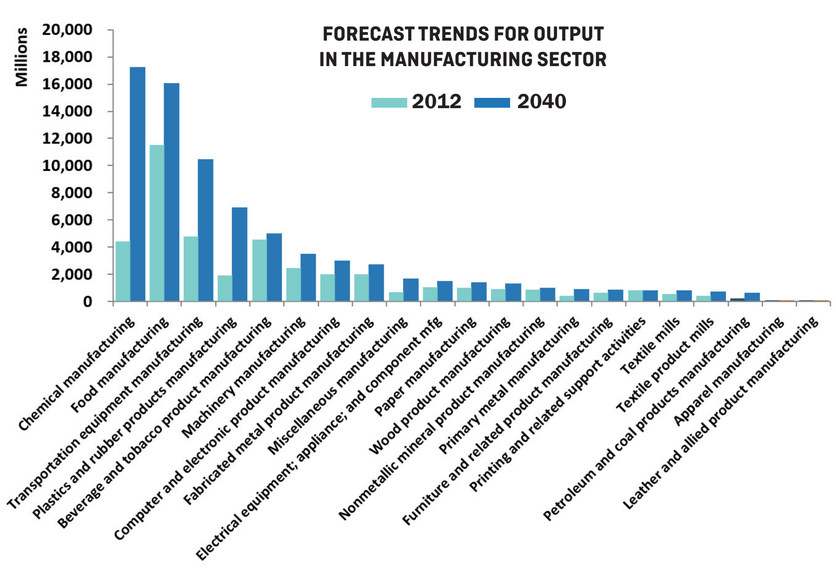


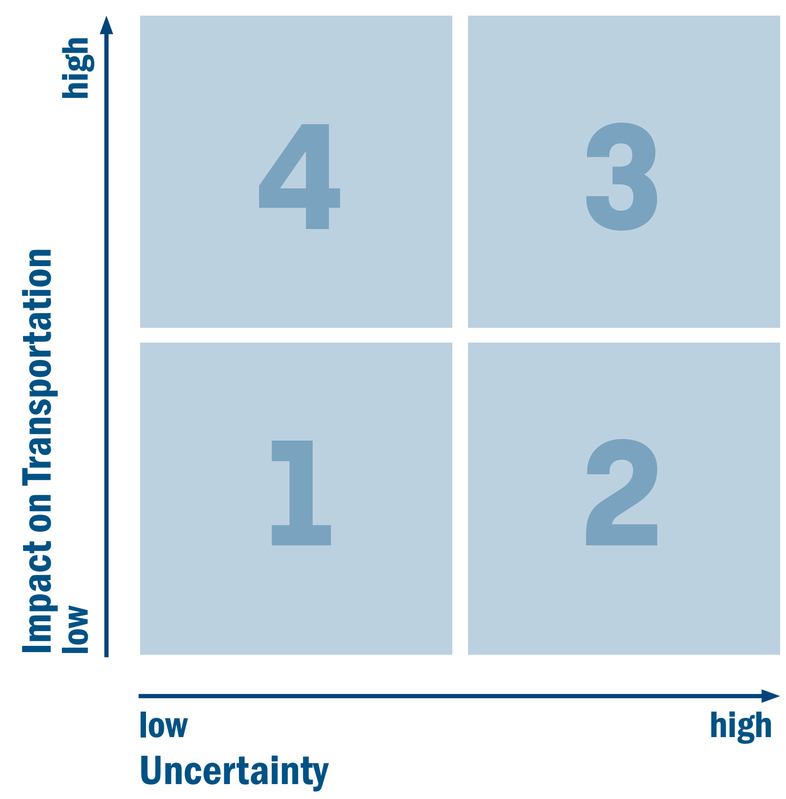




A Change in Industry

Growth in freight movements is projected as well. Trucking continues to be the dominant mode, but other modes such as rail, air, and intermodal freight transportation are quickly growing.





ANALYSIS OF TRENDS

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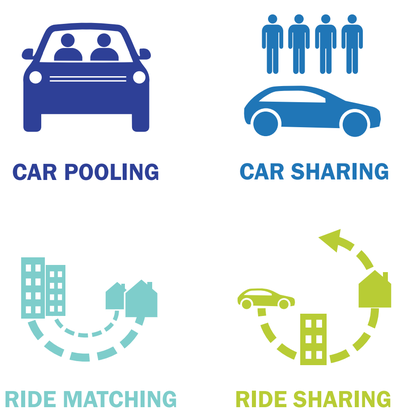
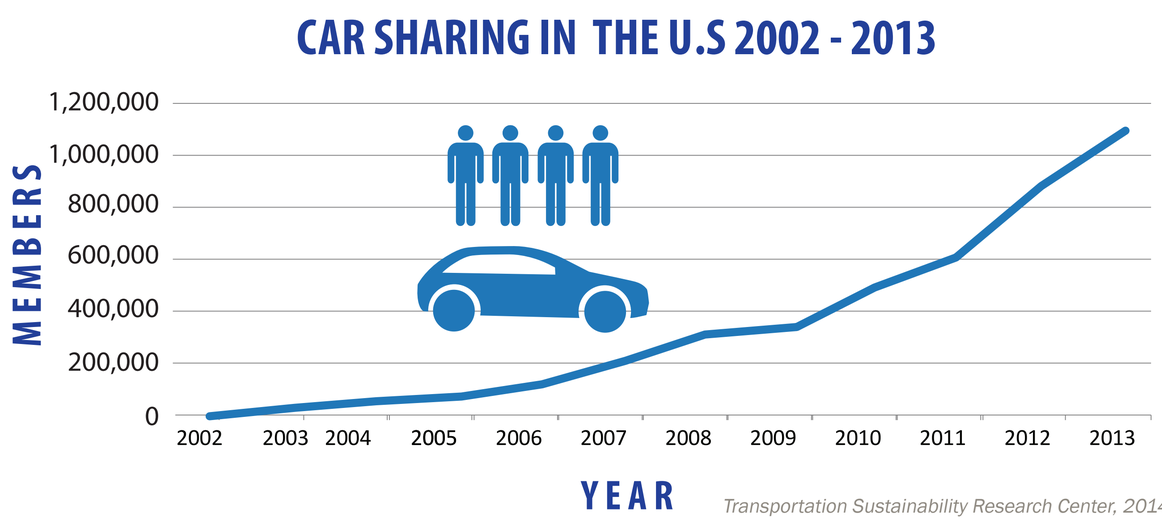
TECHNOLOGICAL

Shared Use Mobility

Technology is bringing shared use mobility, including growth in shared cars, bikes, and rides. The challenge is how to integrate these services into the existing transportation network.





Transportation Sustainability Research Center, 2014

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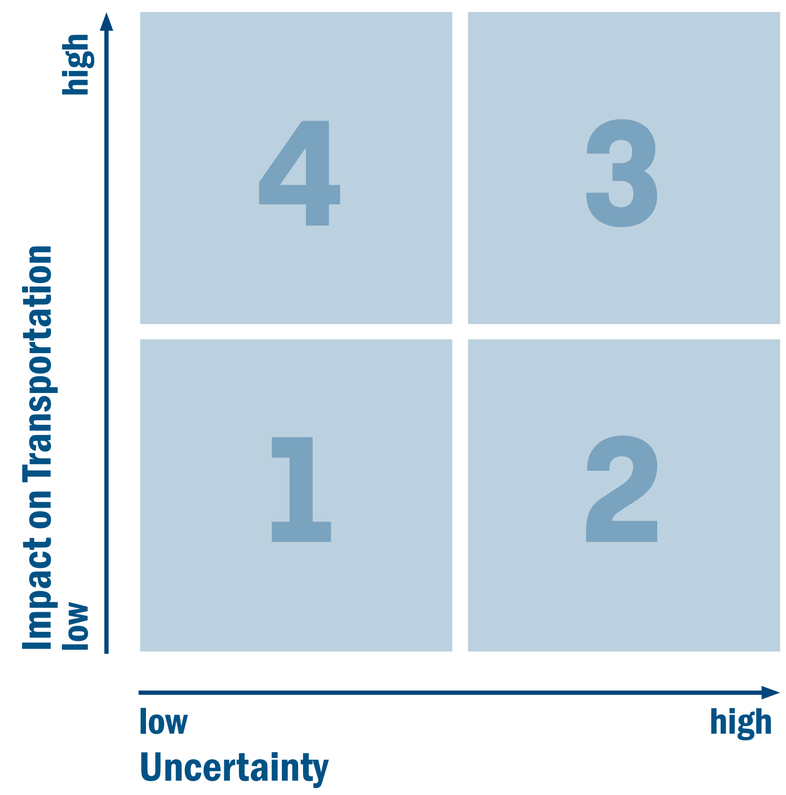
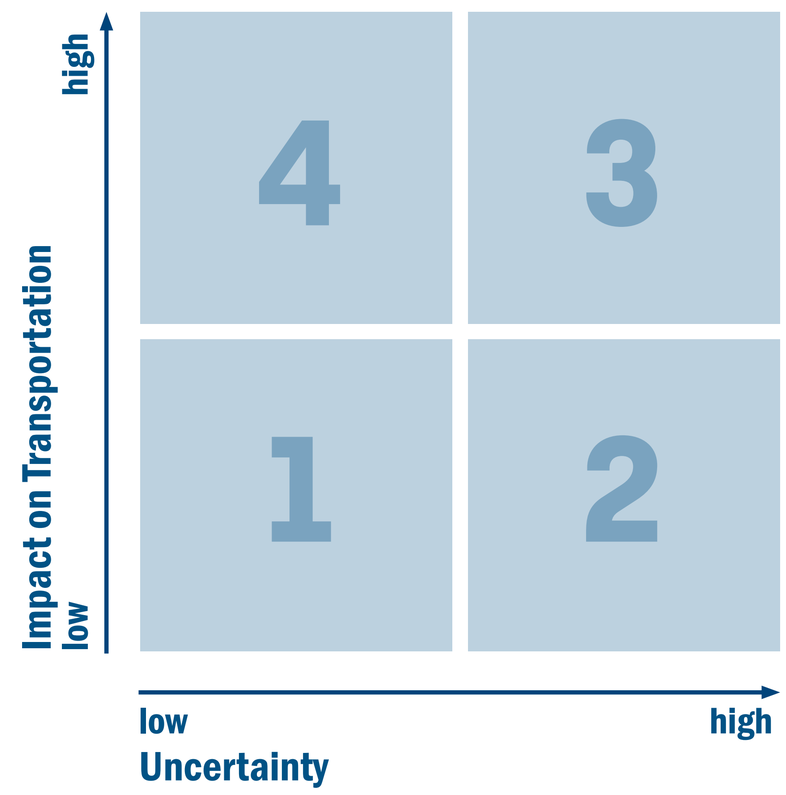


Automated Vehicles

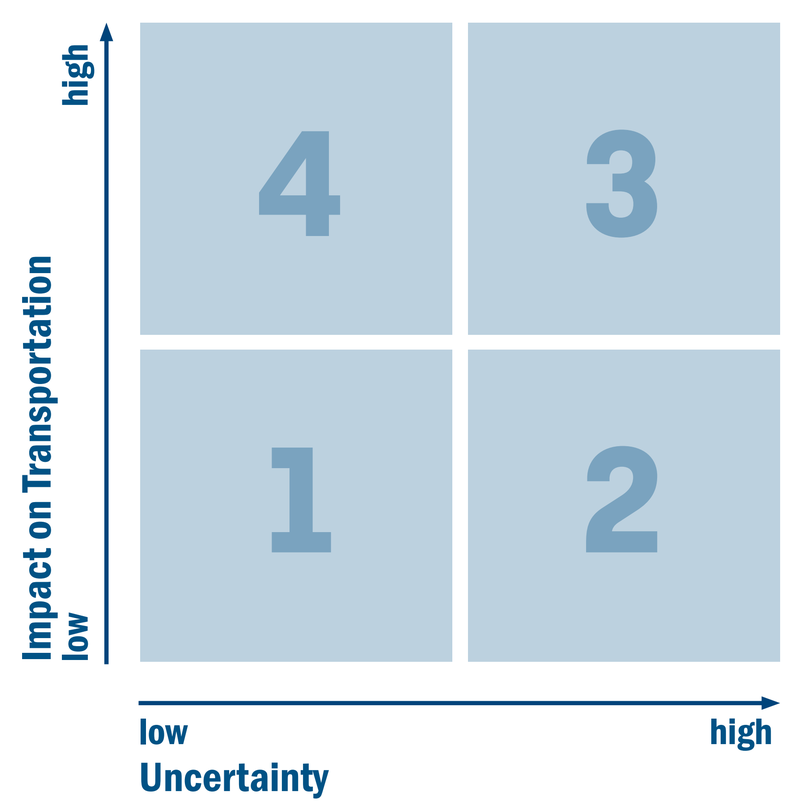
Assumptions about future technological developments will be addressed in the VTrans Multimodal Transportation Plan. Travel reliability is becoming the primary concern and requires enhanced system performance through technology and user information.

Credit: Slavoljub Pantelic/Shutterstock.com



Smart Infrastructure

Information systems technologies can help us make 'smarter' use of transportation networks. This may improve safety, congestion, fuel economy, and identify cost-effective investments that focus on improving reliability over speed.

- TEST BED ON I-66, I-495 (FAIRFAX)
- VIRGINIA SMART ROAD BY VTTI AND VDOT
- DYNAMIC PAINT, ANTI-ICING
- INNOVATIONS IN ROADWAY MATERIAL

- WIRELESS VEHICLE COMMUNICATION
- WIRELESS ELECTRIC-CHARGING