

Urbanism Next
Conference
March 6, 2018



The Role of Transit in an Automated Future Planning for Uncertainty

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Planning for Uncertain Times

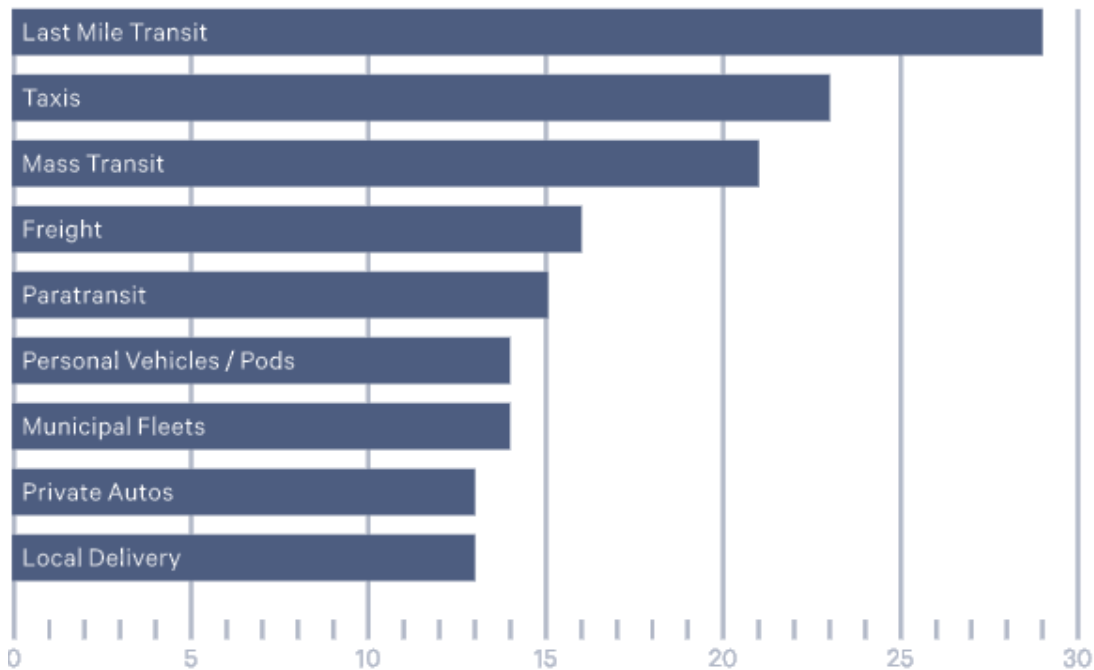


How are Communities Planning for CAV?

Bloomberg and the Aspen Institute reached out to 38 cities who are actively working on CAV strategies and found that:

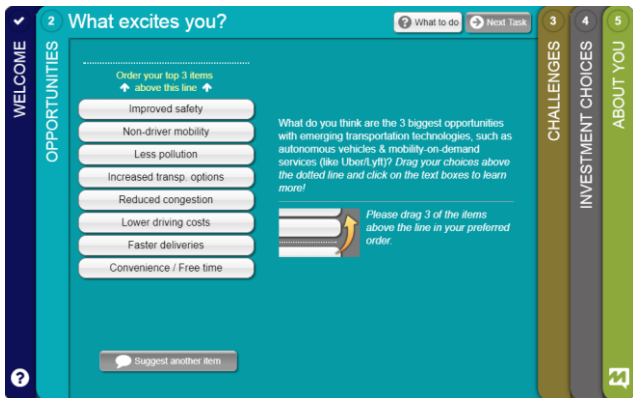
- Last mile transit is the “low-hanging fruit” (*right*)
- Lack of funds is seen as the biggest barrier to municipal CAV efforts

Anticipated Uses of CAVs



Source: Bloomberg.org

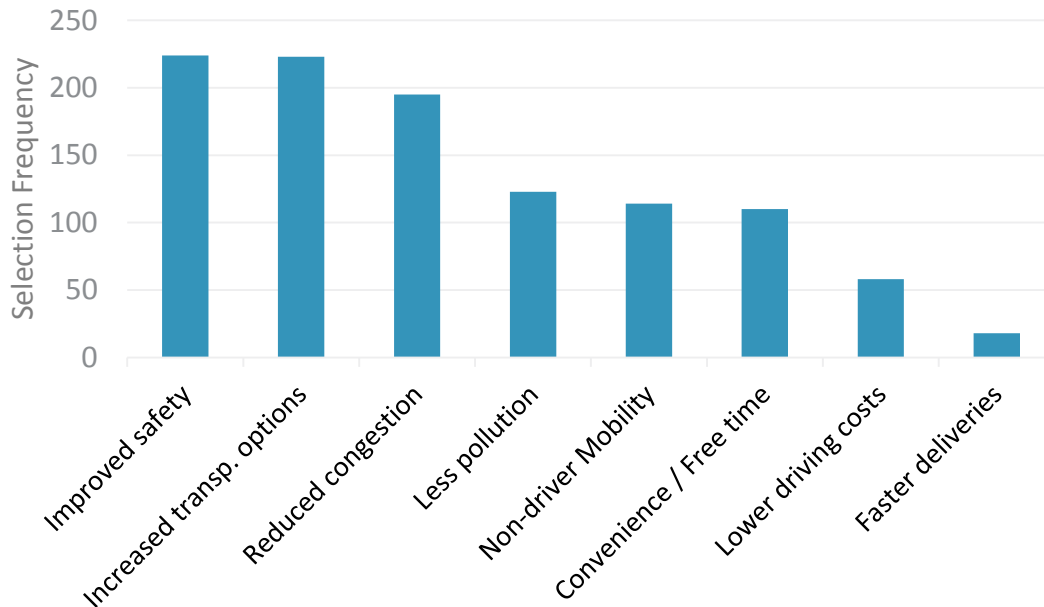
Technology Opportunities



- 1,065 Rankings for eight categories
- 57 Comments

Respondents could select 3 items

Perceived Opportunities Regarding
Emerging Transportation Technologies



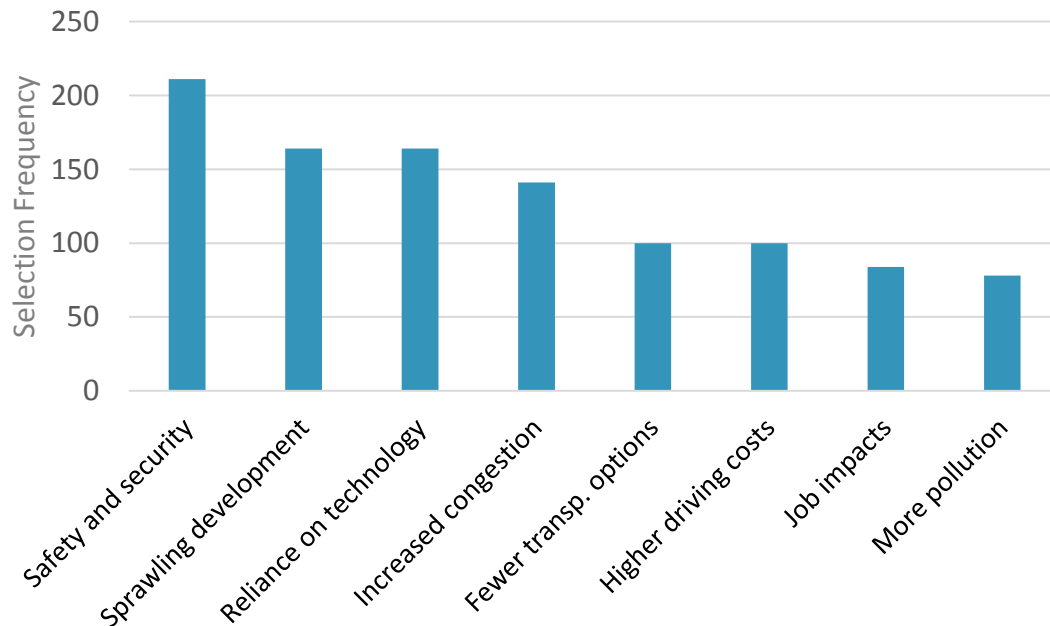
Technology Concerns



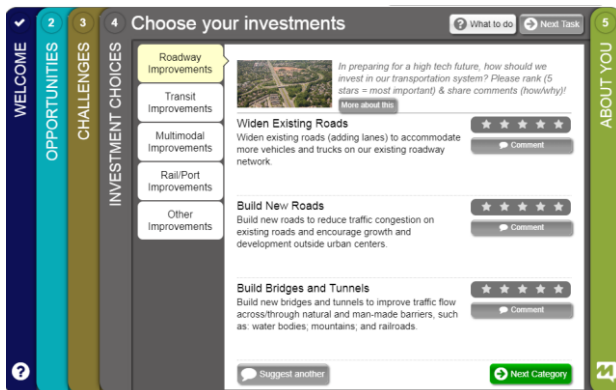
- 1,042 Rankings for eight categories
- 33 Comments

Respondents could select 3 items

Perceived Concerns Regarding
Emerging Transportation Technologies

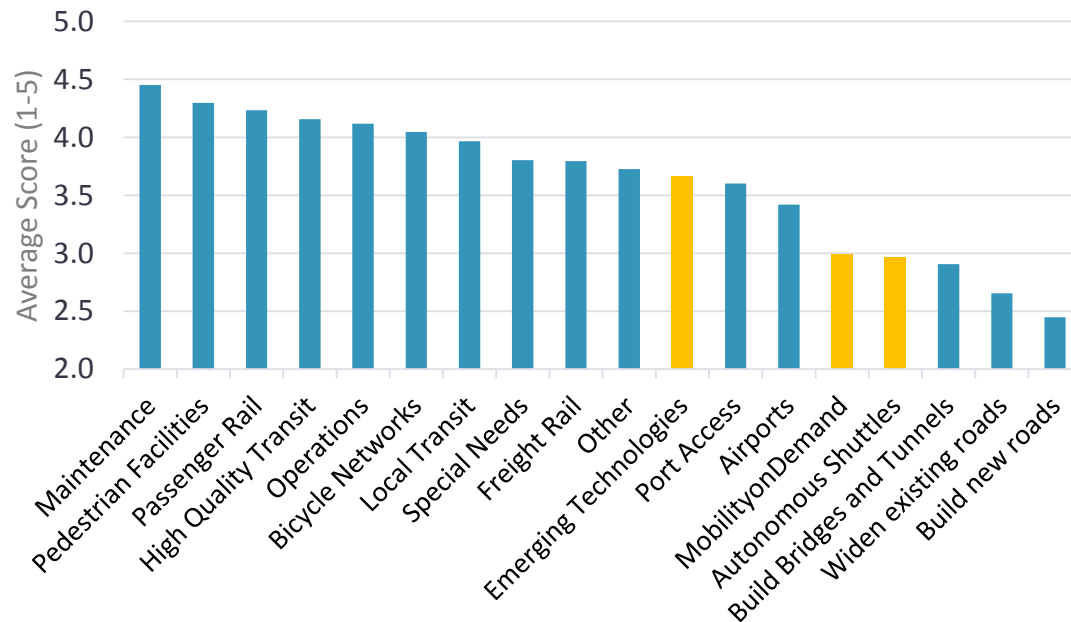


Investment Priorities



- 6,102 Total Rankings
- 573 Comments
- Emerging technologies, mobility on demand, and autonomous shuttles all ranked outside the top 10

Investment Priorities: Average Scores
(5 = highest possible score)



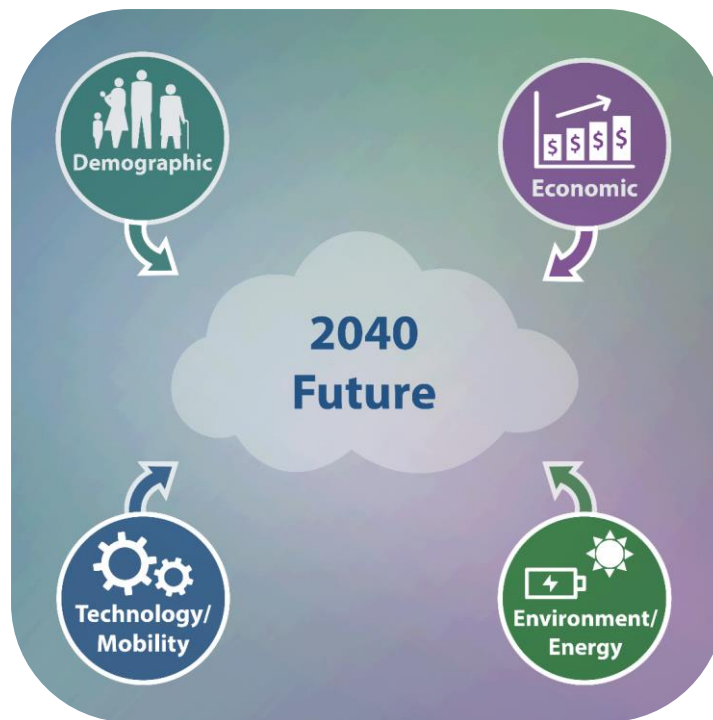
How do we plan for uncertainty?



Preparing for Uncertainty: Scenario Planning

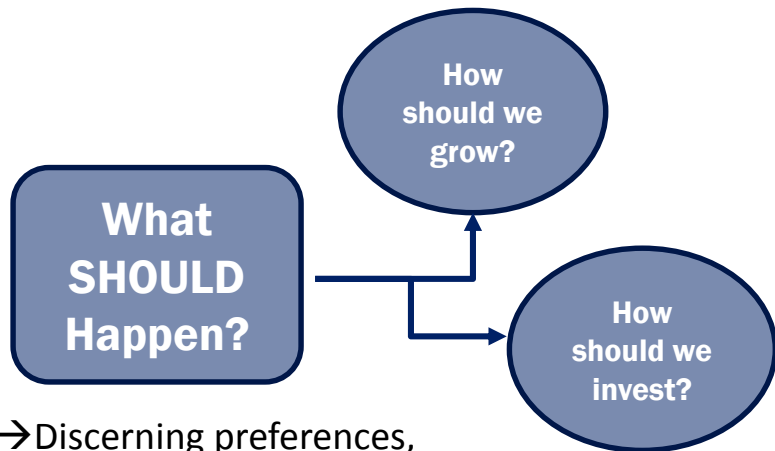
OVERVIEW

Scenario Planning for Uncertain Times



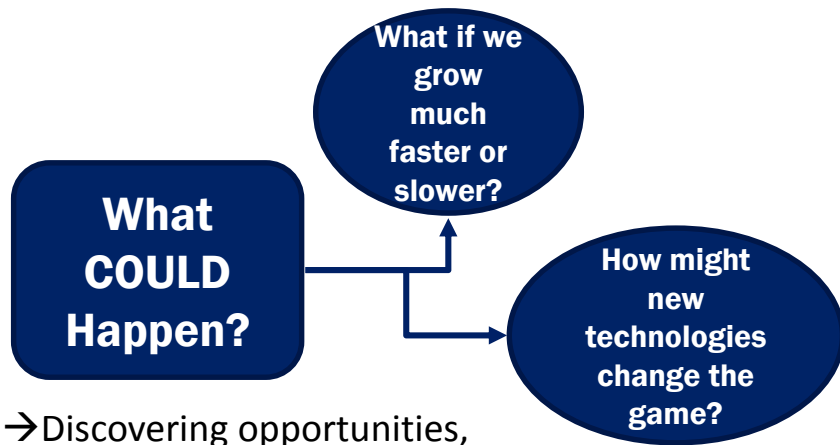
Scenario Planning Approaches

Normative scenarios envision what **SHOULD** happen?



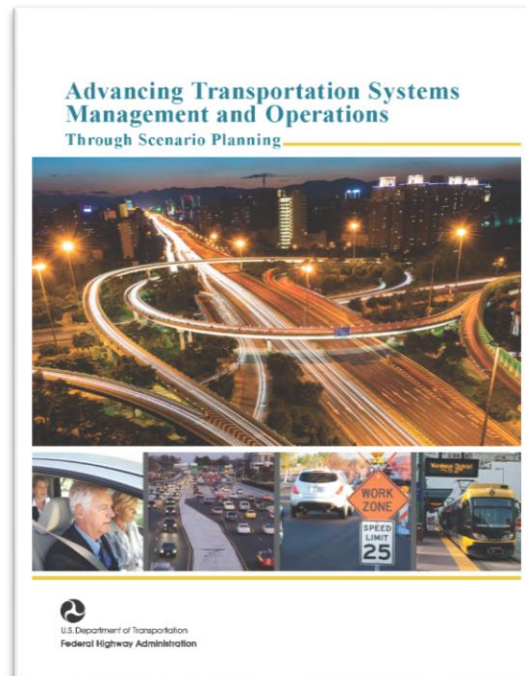
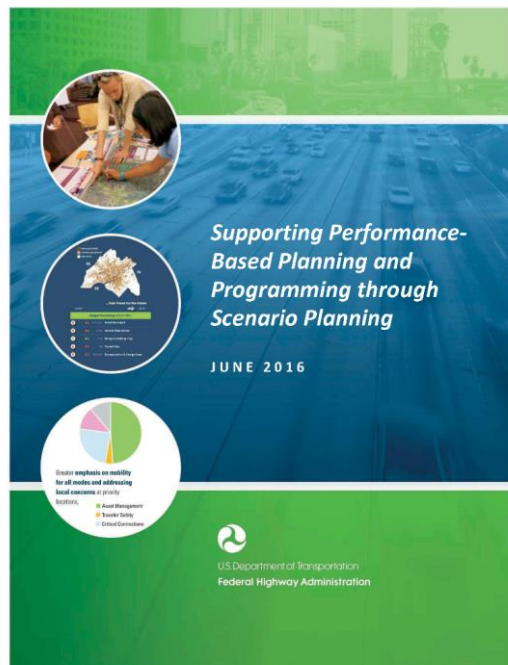
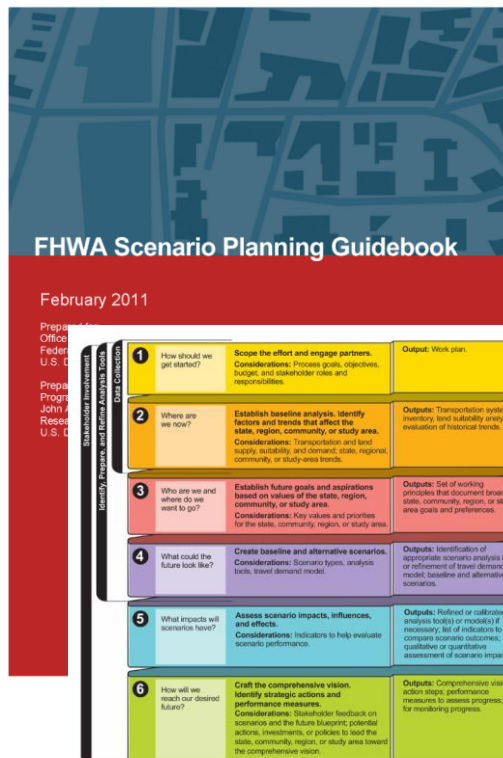
→ Discerning preferences, articulating values, shaping vision, strategizing preferred outcomes

EXPLORATORY scenarios ask what **COULD** happen?



→ Discovering opportunities, identifying risks, shaping tactics, optimizing chances of success

FHWA Scenario Planning Guidance



Stay tuned for new publications on "NextGen" Exploratory Scenario Planning...

Start with Drivers

DRIVERS

(What drives change globally)

DEMOGRAPHIC

ECONOMIC

TECHNOLOGICAL

ENVIRONMENTAL

TRANSPORTATION OUTCOMES

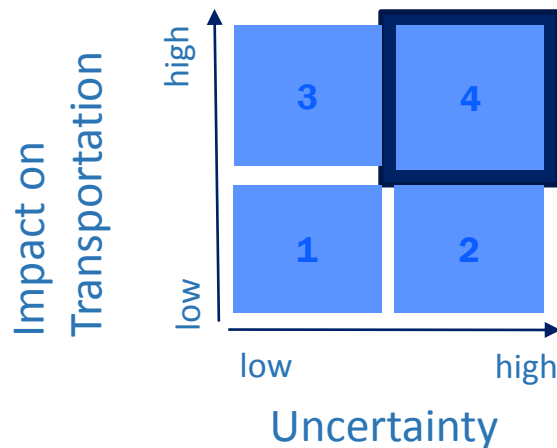
(How global change can affect transportation)

DEMAND/BEHAVIOR

SUPPLY / DELIVERY

OPERATIONS / PERFORMANCE

SYSTEM / USER COSTS



Assessing Drivers



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.



CAR POOLING



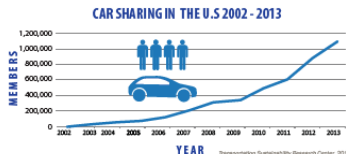
CAR SHARING



RIDE MATCHING



RIDE SHARING



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.



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.



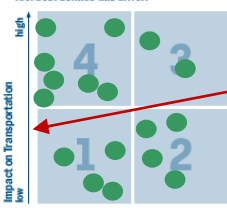
- TEST BED ON I-66, I-495 (FAIRFAX)
- VIRGINIA SMART ROAD BY VTI AND VDOT
- DYNAMIC PAINT, ANTI-ICING
- INNOVATIONS IN ROADWAY MATERIAL



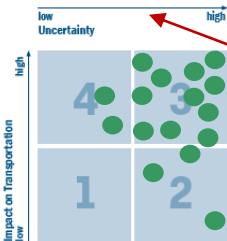
- WIRELESS VEHICLE COMMUNICATION
- WIRELESS ELECTRIC-CHARGING



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



Y-Axis – Impact on Transportation

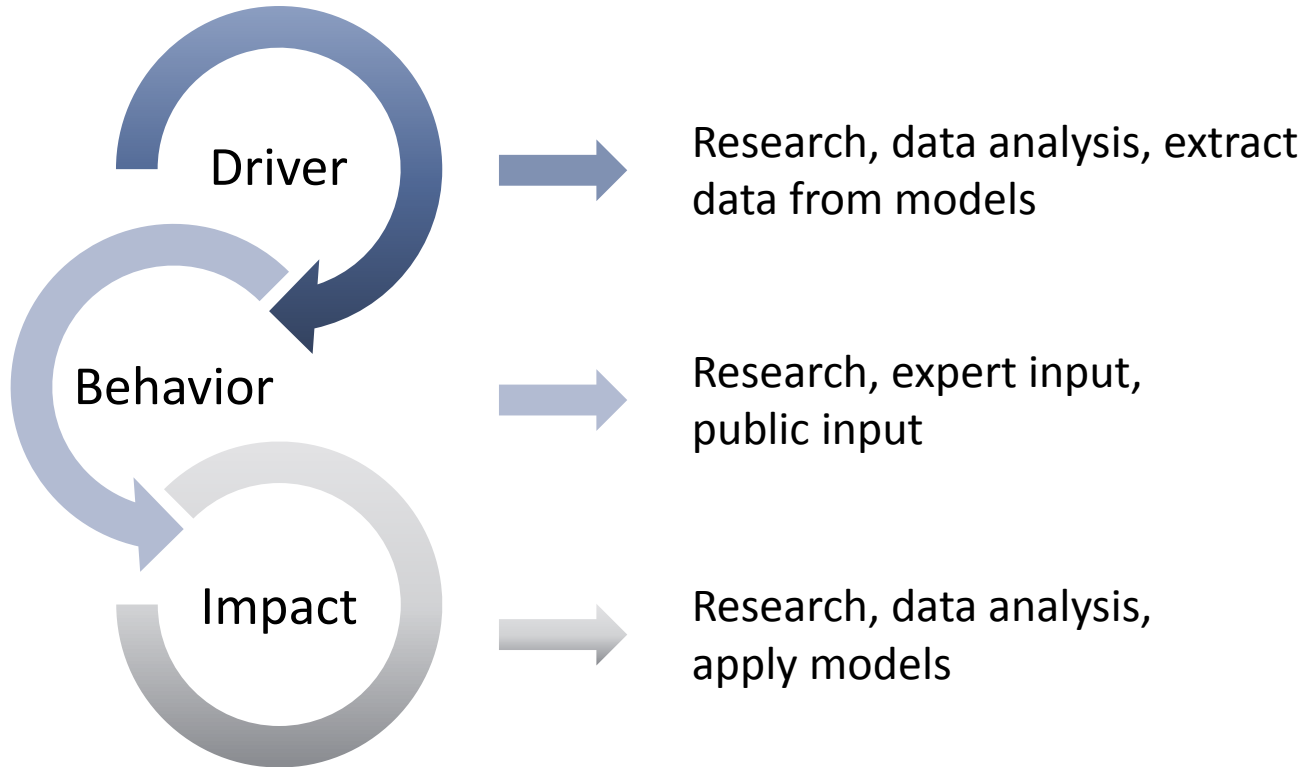


X-Axis – Degree of Uncertainty



Example of Public
Input Received on
Technology Drivers

Chain of Logic from Inputs to Outputs



Potential Scenario Planning Outputs

Person Travel

Person Trips



Person Miles



Mode Mix



Freight Movement

Freight Trips



Ton Miles



Mode Mix



All Travel

Recurring
Congestion



Vehicle Miles



Non-Recurring
Congestion



Costs

User Costs

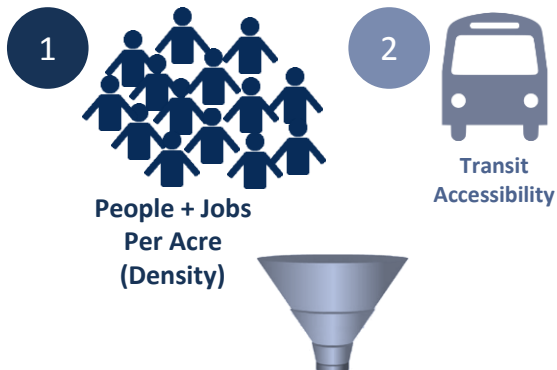


System Costs



Linking Land Use and Transportation

Two Key Criteria to Define Placetypes



*The VTrans2040 Placetypes reflect areas with noticeable differences in travel behavior as it relates to land use patterns. Each place type varies by **mode split** and **VMT per capita***



V1 –
Rural

V2 – Low-
Density
Suburban

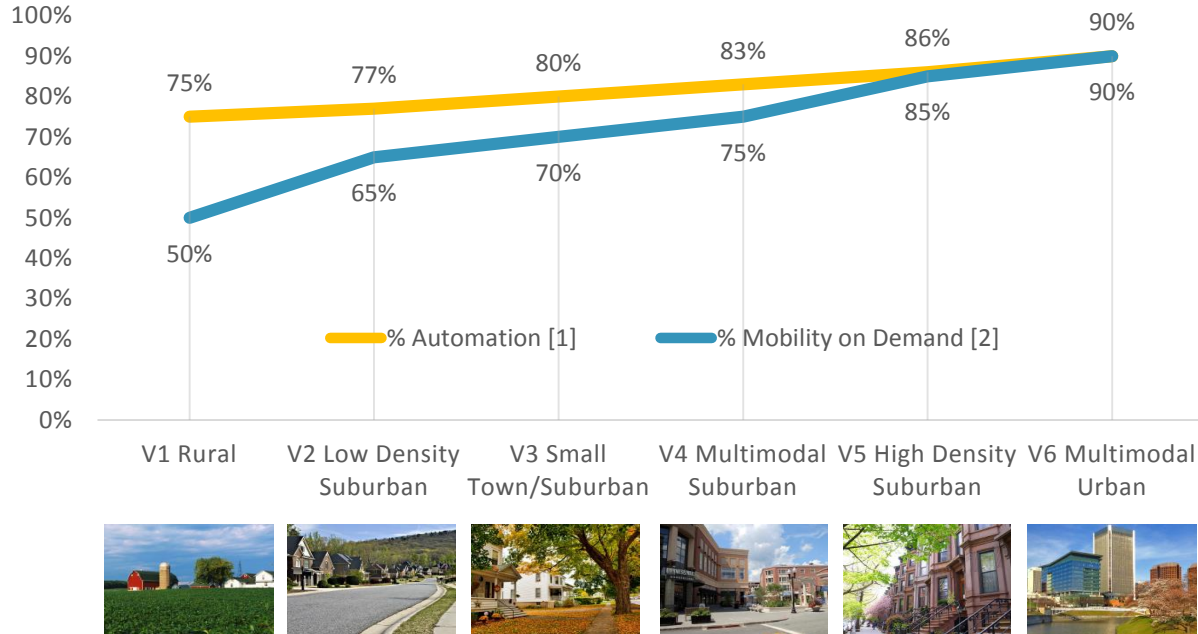
V3 – Small
Town/
Suburban

V4 –
Multimodal
Suburban

V5 – High
Density
Suburban

V6 –
Multimodal
Urban

Linking Land Use and Transportation - Example



[1] [2] Information above was inspired by public input



V2V connectivity. I-95 Corridor Coalition

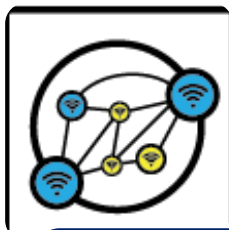
Scenario Overview



High Growth Industrial

- Less Urban
- Higher VMT Assumptions

Industrial Renaissance



High Growth High Tech

- More Urban
- More Multimodal

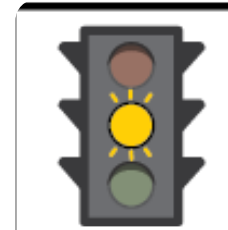
Tectopia



Moderate Growth

- Older Demographics
- Walkable Places

Silver Age



Reduced Growth

- Federal Spending Reduced
- Slower adoption of technology

General Slowdown

Key Findings:

How can we prepare for the future?

Anticipate Increased Demand

- Automated and on-demand vehicles will unleash growth in travel demand
- Foreseeable changes in travel behavior with connected and automated vehicles (CAV) will increase travel demand
- Tech. innovations in the economy as well as transportation will spur growth in freight traffic

Technology Will Enhance System Performance

- Safety improvements will reduce congestion from incidents
- Information will improve efficient use of the whole system
- Vehicles will become safer, smaller, and able to travel closer together

Timing is Key – Balancing these two sides of the technology future is critical

Design is also Key – Walkable and multimodal places have the most balanced outcomes

Takeaways by Placetype

V1 –
Rural



V2 – Low-Density
Suburban



V3 – Small
Town/Suburban



V4 – Multimodal
Suburban



V5 – High Density
Suburban



V6 – Multimodal
Urban



V7 – High
Density Urban



Recurring congestion on two-lane rural roads

More VMT on local streets and collectors

More trips in high density suburban/urban areas



Operational Improvements

Innovative intersection design, dedicated CAV lanes on highways

Demand Management

*ITS, carpools, vanpools park & ride, transit, and peak travel restrictions

Complete Streets

w/ flexible route transit

Complete Streets

w/ integrated, full-spectrum transit



Risks Specific to Transit

- Mobility-on-demand could threaten transit viability
- Mobility-on-demand pricing could have equity implications
- Decoupling transit and land use planning could affect urban form, with additional consequences
- Rising transportation demand could cause additional congestion (and pollution)
- Local streets and other two-lane roads may have challenges accommodating higher demand





Opportunities

- Coordination of transportation, land use and community design can establish the roles of transit and mobility on demand to meet local objectives
- Early adoption of CAV technology in transit can support more efficient, cost effective and accessible public transportation
- Funding to support transit can be bolstered by partnerships with private sector entities on sharing trip-making data generated from CAVs, Smart Corridors, etc.



It's all Related



Thank You!

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