What is TRANSFUTURE:

• Web based scenario planning tool to help evaluate emerging technologies and societal trends.

• Developed for FDOT District.

• Extends the value of Travel Demand Model Output

• Provides insight for future corridor planning.
Emerging Trends

Changing Demographics
- Millennial travel behavior
- Aging population
- Generation Z

Improved Technology
- Automated vehicles
- EVs
- Workplace automation
- Improved user information & navigation
- Smart City

Shifting User Preferences
- Urbanization
- Shift from individual ownership to fleet ownership
- Telecommuting
- E-commerce & delivery options

Improved Travel Options
- Better walking and biking options
- Improved public transit
- Shared mobility
Autonomous & Connected Vehicles

- Five-fold roadway capacity increase
- 90% + reduction in crashes
- New driving experience
Shared Mobility

- Potential to reduce fleet size by 90 percent
- Shared auto-ownership impacts
Workplace Automation

- Jobs at risk for automation
- Transformation of the labor force
Science or Fiction?

Straddling Bus ▲ Transit X

Helium Airships ▲ Hyperloop

Carbon-free Autonomous Mass transit
Transformation is Real
Sorting Facts from Fiction

- Optimal adoption point for best value
- Cutting edge vs. bleeding edge
Why Now?

- Moore’s law – computing power doubles every 2 years
Decision Making Challenge

- How to prepare for the unknown?
Introducing TransFuture

• Next-gen scenario planning tool
• Prepare for multiple futures
• Explicitly account for uncertainty
• Add-on lens to improve decision-making
Literature Sample

- Autonomous Vehicle Implementation Predictions – VTPI
- NCHRP Report 750, Informing Transportation’s Future – TRB
- Preparing a Nation for Autonomous Vehicles – Eno Center
- Shared Mobility and the Transformation of Public Transit - APTA
- Millennials & Mobility: Understanding the Millennial Mindset – APTA
- City of the Future – National League of Cities
- Shared Mobility and the Transformation of Public Transit – APTA
- Evaluating Carsharing Benefits – VTPI
- Planning for an Uncertain Future: Using Scenario Planning to Add Clarity When the Future Is Unclear - TRB
Jointly Determined Probabilities

\[ F = f (A, B, C, D, \ldots) \]

- Impact of Aging on Demand, %
- Impact of AV on Effective Capacity, %
- Impact of Telecommuting on Demand, %
- Impact of Enhanced Navigation, %

Accounting for Uncertainty

- Joint probability distribution

\[ 2035 \text{ LOS} \]

A strike zone is not a single point.
Conceptual Framework

**Frontend**
- Regional travel demand model files
- Define scenarios

**Process**
- Probabilistic results and confidence intervals - AADT, VMT, VHT, etc.
- Scenario comparison
- Facility footprint

**Output**

**Backend**
- Regression analysis
- Elasticity analysis
- Monte Carlo Simulation
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