TSM&O CONSORTIUM MEETING SUMMARY

Meeting Date:	April 5, 2018 (Thursday)	**Time**: 10:00 AM – 12:00 PM
Subject:	TSM&O Consortium Meeting	
Meeting Location:	FDOT's Orlando Office 133 S. Semoran Blvd., Orlando, FL Lake Apopka B Conference Room	

I. OVERVIEW

The purpose of this recurring meeting is to provide an opportunity for District Five FDOT staff and regional agency partners to collaborate on the state of the TSM&O Program and ongoing efforts in District Five. David Williams gave a short introduction and explained the meeting agenda.

II. FDOT D5 10-YEAR TSM&O REQUEST LIST (CFMPOA PRESENTATION) - DAVID WILLIAMS, VHB

David Williams gave a brief update to Consortium members on the status of the District Five TSM&O Ten-Year Request List.

- 2017 Strategic Plan emphasized certain strategies with a regional approach:
  - Connected Vehicle Strategies
  - Advanced Signal Control Technologies (ASCT)
  - Automated Traffic Signal Performance Measures (ATSPM)
  - Ramp Metering
  - Integrated Corridor Management System (ICM)
  - Active Arterial Management (AAM)
- The District started looking at potential diversion routes along freeways that could be upgraded to "ICMS-ready"
  - This would allow operators to more effectively manage large traffic volumes in the event of a major incident on the interstate or expressway
- What is ICMS-ready?
  - The project team identified the following infrastructure as the base level for intersections to be ICMS-ready:
    - Advanced Transportation Control (ATC) signal control,
    - Intersection Movement Counts (IMC),
    - Dedicated Short-Range Communication (DSRC) radio and hardware,
    - CCTV surveillance camera and hardware (not all locations), and
    - Network Communications (including fiber optics and managed ethernet switch)
- Construction Phase Program Cost estimates of diversion routes
- Operations – estimated at $300,000 per year in operation

- David also showed a list of TPO/local agency projects identified by the team as eligible for a portion of FDOT funding
- Next steps:
    - Prioritize diversion routes
    - At July 13th CFMPOA meeting,[1] present the finalized proposal for inclusion into the Regional Prioritized Projects List (PPL)
- Q: Where ATC is required but not available what will happen?
    - Jeremy: When we looked at how much fiber would be needed, we assumed that all the controllers would need to be upgraded, that cameras would be needed at 1/3 of intersections, and that all needed DSRC – in summary, the estimates were rough
    - Also looked at what was in the MPO PPL compared with GIS map – if there were duplicates we took it off the list and found which projects were left
    - Grouped based on the MPO – wanted to create a manageable list of priorities rather than breaking down into hundreds of individual projects.
- Jeremy: Is this the correct strategy or should the District be looking at something else?
    - There were no voiced concerns to this strategy
- Jon Cheney: Is the list finalized or is it still in draft?
    - A: It is still in draft and we can send out the KML (Google Maps) file
        - We wanted to give an explanation of what we were trying to achieve before we showed the results
    - Did you use the existing detour routes from the Traffic Incident Management (TIM) program as a basis?
        - A: We compared them, but they were not based on that. The routes are similar but not the same.
- Project team assumed 100% replacement to be conservative, hopefully the costs would be lower than estimated here
- We tried to spread the costs over the years, but if this is unrealistic please let us know
- If the unit costs for each upgrade are not comparable to prices you are encountering, please let us know
- The costs provided are present value only, and do not account for future values
- At what density should we be looking at turning movement counts?
    - There are some details like this to work out
- Jon Cheney: When you are making this sales pitch to planning organizations, you should highlight safety benefits and that this criterion must be met by each MPO – they will have their own performance measures to work with as part of the Congestion Management Plan (CMP)
    - A: We want to serve the region and not the needs of specific organizations
    - Jeremy asked that if the project team could meet with Jon to discuss his suggestions further. Jon agreed.

III. TSM&O STRATEGY GUIDE UPDATE – DAVID WILLIAMS, VHB

David Williams provided a brief explanation of progress on the District's TSMO Strategy guide.

- Goal: integrate TSMO into the FDOT planning process
- Put together an improved second draft – 17 new strategies, 15 new issues, capital costs, operating costs; 104 total strategies, 41 total issues

[1] The April CFMPOA Meeting has been canceled.

- The User Manual is in development as well
- Jeremy: There are relative applications, and we don't want to be so specific that the information becomes immediately dated; therefore, for capital costs and operating costs we only used a relative ($ to $$$) scale. We call it a "WebMD" for roads – the goal is not to be perfect but a guide to steer in a general direction. Once users identify the correct strategy, that's when they consult with an expert in that field.

IV. SIGNAL TECHNICIAN PROGRAM AT ORANGE TECHINCAL COLLEGE UPDATE – DAVID WILLIAMS, VHB

David Williams provided a brief update on the recent signal technician deficit and efforts to work with Orange Technical College to help create a talent pipeline.

- Sent letter to Orange Technical College formally stating the signal technician need. Out of those agencies and firms that responded, there was a range of annual hires from 15 to 23 signal technicians per year.
    - Awaiting feedback from the college
- Clarification from February Consortium: Is there a diploma required?
    - The three courses identified for a potential program do not require a diploma, as they are dual-enrollment courses for high school students
        - Basic Electricity
        - Electronics Technology I & II
        - Network/Server Support
    - It is unknown if combining these courses will affect prerequisites
- Jon Cheney: When they graduate from the program, what certification will they have? We'd like them to have IMSA Level 1 certification at minimum, and preferably Level 2 certification.
    - A: We don't know yet, but we may help with developing the curriculum and creating a name for the certificate to make the program more formal

V. TRANSFUTURE – PROBALISTIC SCENARIO PLANNING TOOL – JOHN ZIELINSKI, DISTRICT FIVE PLEMO – SANTANU ROY, HDR

David Williams introduced John Zielinski and indicated that TransFuture is now available. John Zielinski gave a general overview of the tool and then introduced Santanu Roy, who explained the design of the system in detail.

- John was tasked with projecting the 50-year growth of the East Central Florida area. Since existing models weren't appropriate for longer term planning, the project team decided to make their own tool.
- AV/CV penetration was a primary factor to consider, but there are many other factors including demographics, economy, working from home. Predicting these many factors all at once is the focus of the tool.
    - We need to be careful not to plan for stranded assets and not to overbuild
- John introduced Santanu Roy who led the economics component of the project
- AV/CV could increase capacity by factor of 5; 90% reduction in crashes; no longer focused on driving
- When combining with shared mobility we can consider that the fleet size will be reduced by 90%

- Internet of Things (IoT) and data will improve efficiencies
- SmartCities challenge – many different ideas like the straddling bus, Hyperloop, how do we know what to take seriously for 50-year timelines?
- In the early 1900s there was a planning conference for how to deal with horse manure. Technology of tomorrow may solve some of our most pressing issues (like congestion)
- How to sort facts from fiction and when to adopt? Too early and you underachieve with high costs, but wait too long and you are underutilizing your assets
- So why start to adopt technology now?
    - The technology is ready, improving quickly, the market is ready too
        - 34 states enacted AV legislation since 2012
        - Price of batteries for electric cars is dropping quickly
- It is clear that things are changing quickly, but today's forecasting tools don't adequately prepare us for tomorrow
- We cannot prepare for one future, we need to understand the multiple possibilities of tomorrow and acknowledge uncertainties
- Scenario planning chooses many different specific scenarios and takes them far in one direction, but we need to be prepared for everything happening at once
- Team worked to identify trends, quantify those trends, understand uncertainties, make informed decisions and in the end work towards an implementation plan
- Emerging Trends:
    - Changing demographics, improved technology, shifting user preferences, improved travel options
- Started with reviewing significant amount of data and documentation
- Considered capacity and demand increase, nobody knows what is right
- Workplace automation will also have a large impact on travel and job availability
- Conceptual framework
    - Frontend: Regional travel demand models
    - Backend: Regression, Monte Carlo models
- The tool is a cloud-based web-application – the processing for each model can be run in two minutes
- Future AADTs given as a range, not a singular number
    - New model shows capacity of 6 lane road increases because of efficiency improvements
    - New model shows that you may never need 10 lanes
- Do not build things that you may not need, but invest in technology and TSM&O principles
- Design with flexibility, with modular lanes
    - Dynamic lane markings
    - Right pavement design
    - Full depth shoulder
- Q: We need to consider that AV will be circling after it drops people off downtown, how do we account for this?
    - A: VMT will probably go up because of this circling, but parking demand will be reduced so many of this infrastructure can be dedicated to waiting areas.
- Q: You said don't build it if you don't need it, but today people are building their infrastructure to the maximum, we cannot build in extra ROW just in case.
    - A: Agreed, and I think there will be some stranded assets, what happens when we don't need the full facilities that we have already built?

- Q: How will this program be used with MPOs and TPOs?
    - A: We are working with Central Office to roll out guidance for MPOs – right now this tool only considers District Five – but this tool may be used nationwide eventually

VI. AUTOMATED VEHICLES AND LOCAL/REGIONAL PLANNING – AMY SIRMANS, DISTRICT FIVE PLEMO

Amy Sirmans presented a summary of the American Planning Association's (APA) Automated Vehicle Symposium, which was held on October 6, 2017. The Symposium hosted many transportation practitioners and thought leaders in planning and autonomous vehicles.

- PD&E projects are looking at planning 10 years from project open and a 20-year design life. This means we are planning today for significantly different traffic demand. Understanding the future 30 years in advance is difficult.
- Need to consider equity, elderly, workforce, comprehensive planning as well as zoning and land use
- Legislation Update
    - Federal Legislation
        - House passed SELF Drive Act
        - Senate sent AV START Act to floor in November 2017
        - These bills will need to be made identical before they are made official
        - Smart Cities Communities Act
        - USDOT published guidance (version 2 already)
    - Since 2012, 41 states have considered AV-related legislation
        - 22 states have passed legislation
    - During 2017/18 Florida Session
        - A new bill was introduced but withdrawn, exempting drivers from having to be physically present in a fully autonomous vehicle and also setting insurance requirements
- Major focus of discussion panels
    - How can AV expand access for all people?
        - How do we ensure AV does not reinforce existing disparities?
        - 1 in 5 have "retired from driving"
        - 57 million with disability; 6 million struggle with access to transportation
    - How will AV impact the transportation ecosystem?
        - 80% of traffic fatalities can be attributed to human error
        - New services (MaaS, rideshare, etc.) will improve mobility
        - Are Uber and Lyft a sign of things to come for AV/CV?
            + Increased mobility & convenience
            + Cheaper than personal vehicle ownership
            – Increased VMT
            – Disruptive curbside pickup/dropoff
            – Reduced transit use
        - Will free "drive" time lead to increased urban sprawl?
            - AV will turn commuters into passengers; will commuters care as much about a longer commute at that point
            - Similarly, drive times will be reduced by AV efficiencies; what will commuters do with those time savings? Accept them or move further away from the CBD?

  - How will AV impact governments and local cities
    - Add *Future Element* – similar to *Transportation* or *Housing* elements – that encourages small scale demos and pilot projects; "future proofing"
    - How to keep AVs from encouraging sprawl?
    - Sustainability plans can encourage shared electric AVs to reduce GHG emissions
    - Identify what locations may get freed up
- Key Policy concerns
  - Roles and responsibilities at each government level
  - Curb demand management
- How NOT to plan for AV:
  - World War II era planning focused on the car and created sprawl and suburbs
  - Need to shift thinking not toward maximizing use of AVs, but rather making a community that we want with AVs supporting the community's vision
- Public investments
  - How to address declining revenues?
  - Shifting investment needs in physical and communications infrastructure
    - Large capital costs must give way to increased operations and maintenance (O&M) costs
  - Alternative revenue streams?
    - Per mile VMT fee administered by USDOT
      - Best approach identified by Symposium attendees was to apply VMT to
    - Local pricing strategies on parking, curbside use and commuter traffic
    - PPPs with MaaS companies
- Jon Cheney: With ridesharing programs currently around, does FDOT have policies in place for pick-ups/drop-offs? Or is that left up to localities?
  - A: City of Orlando is piloting pick-up and drop-offs for these services; the District probably isn't responsible for this

VII. CURRENT INITIATIVES – JEREMY DILMORE, FDOT DISTRICT FIVE

Jeremy Dilmore provided an update on all current projects in the District.

- CFAVP
  - Trying to formally establish the partnership via Interlocal Agreement
  - Exploring the mechanisms and will probably use and interlocal agreement, talking about priority projects that will be listed under the partnership
  - Formation of committees - we have elected the chair and co-chair but not progressed much further than that
  - Other groups across the country have formed differently
  - Most groups are waiting on some action from the Federal government and in several groups, key partners are carrying the weight
  - We are probably ahead of the curve in terms of number of engaged partners
  - USDOT Requirement of Proving Grounds:
    - Formal organization,
    - Safety plan, and
    - Develop outgoing correspondence and communication with public

  - Santanu Roy: Are there funds available for CFAVP?
    - A: Elements of the Pilot Proving Grounds effort are unclear given the new infrastructure plan. There are currently no funds available, but the CFAVP is formalizing its processes in preparation for funds being made available by USDOT
- Integrated Corridor Management (ICM) software contract
  - NTP given – we are ready to get started working with deliverables
  - Broke out modeling software separately – shortlisted who will perform the operational work
  - Next steps:
    - Design docs (Federal compliance)
      - Risk management, AST requirement
    - We haven't reached out because we are working on Federal requirements, but we will consult further when we get into design. The comment period is short, so be on the lookout for updates.
- PedSafe/Greenways and Other AV/CV efforts
  - Invite to go to Seminole County Traffic Signal shop to see the progress of CV testing
    - Things are not mature between controller and roadside unit
    - Development of project will include standard designs and matrix for compatibility; understanding compatibility between on-board units (OBU) and road-side units (RSU) is very important
  - LYNX results from AVMI RFI were given to District Five
    - Waiting on Federal authorization of funds to begin development of RFP
- ICM operations
  - Still moving, added one person to the Metric team
  - Have begun process with HNTB team, concentrating on Ocala/Marion area for I-75 FRAME timing plans
- RTMC – Roof is up and work is under way
- We want competition on hardware and software side for AV programs
- Signal Preemption technology – a brief video from the City of Marietta, GA illustrates some of the capabilities of CV technologies
  - Can trigger the light for emergency vehicles
  - Will alert people on their phone that an emergency vehicle is near them
  - Can also alert people that they are speeding in a school zone or work zone
  - Working for early deployment and early wins (Glance Travel Safely, City of Marietta)
- Testing Maintenance Mobile App (MMA) – will communicate with TMC to mark down where the maintenance is located; this will free up on-the-ground maintenance workers from filling out information on the phone while they are working on a roadway
  - Improves communication between maintenance workers and TMC
  - The Construction Mobile App (CMA) is a similar product for construction projects
  - Integrate with LCIS (lane closure application)
- Q: Are the proving grounds tied to any federal funding?
  - A: We heard that we were getting funding in place, and near election there were letters written to secure funding. We wanted to have the partnership agree to certain mechanisms before money arrives, but there is nothing yet.
- Signal data agreement with TTS
  - Jon Cheney: Has anyone signed the agreement with TTS?
    - FDOT has signed the agreement

        - Seminole County drafted its own agreement based on review by legal department
            - Connected signals currently get data from Seminole County, but we haven't been able to get the data because of the different kind of signal timing strategies
    - Also, beneficial to get signal detection and ATSPM – market is not ready to receive this information and are focusing specifically on downtown areas
- Benton Bonney: As we begin moving towards DSRC from proprietary systems – we need to start talking with fire chiefs to let them know that the architecture is changing
    - Have identified an issue where Opticom GPS geolocate properly in close proximity to the fire station; but Orlando is working with a product that notifies that they are leaving the station
    - We can maybe use a smartphone and not even have to buy an OBU
- Benton Bonney: I-4 Ultimate, there are no separate cabinets – likely that all I-4 Cabinets will be fully occupied and there will be no room for anything. We are not using UBS cabinets.
    - A: very helpful information for future RFPs
- ITSIQA – Atkins is building a simulator to test express lanes before we build express routes
    - SunGuide doesn't always work – so FIU made VISSIM connectors so we can test with replay
    - Useful to be able to run the exact same data through
    - In production now, but we are working on lane accuracy
- Big Data/Planning Dashboard
    - Hadoop environment is merging well with Data Fusion Environment (DFE)
    - Its great that we can move data around and that it can ingest data easily, but we don't like the user interface-
        - It is currently getting spit out in JSON strings; wanting to move to a SQL block
            - SQL block will allow us to use with Microsoft Power BI, R, Tableau, etc.
                - That way we don't have to pay for customization
    - This process has been slow, but it is a product of us doing this for the first time
- ATSPM – has stalled some because this staff is also working on CV testing
    - Working on documentation side to guide installers better
    - As soon as we finish with Osceola we will move to Volusia after staff is done with CV

- NEXT MEETING – May 31, 2018

VIII. ATTACHMENTS

- A – Sign in sheets
- B – Presentation Slides
- C – Meeting agenda

END OF SUMMARY

This summary was prepared by Jordan Crandall and David Williams, and is provided as a summary (not verbatim) for use by the Consortium Members. The comments do not reflect FDOT's concurrence. Please review and send comments via e-mail to dwilliams@vhb.com *so they can be finalized for the files.*

TSM&O Consortium Meeting
April 5, 2018

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Welcome to the TSM&O Consortium Meeting

April 5, 2018

Transportation Systems Management & Operations

Meeting Agenda

1. Introduction
2. FDOT D5 TSM&O Request List 2019-2028 (CFMPOA) – Update
3. TSM&O Strategy Guide – Update
4. Signal Technician Program – Update
5. TransFuture – Probabilistic Scenario Planning Tool
6. Automated Vehicles and Local/Regional Planning
7. Current Initiatives

FDOT D5 TSM&O Request List 2019-2028 (CFMPOA Presentation Update)

David Williams, VHB

FDOT D5 TSM&O Request List 2019-2028

- FDOT 2017 TSM&O Strategic Plan emphasized these focus areas:
  - o CV strategies
  - o Advanced Signal Control Technologies (ASCT)
  - o Automated Traffic Signal Performance Measures (ATSPM)
  - o Ramp Metering
  - o Integrated Corridor Management (ICM)
  - o Active Arterial Management (AAM)

FDOT D5 TSM&O Request List 2019-2028

- TSM&O → Regional Processes

- "ICMS-Ready" Diversion Routes
  - **Identification** of potential routes
  - **Cost Estimate** to implement upgrades
  - **Comparison** with ITS Master Plans

FDOT D5 TSM&O Request List 2019-2028

- "ICMS-Ready"
  - Advanced Transportation Controller (ATC) signal control and cabinet assembly
  - Intersection Movement Counts (IMC) and advanced detection hardware (e.g. fish-eye cam)
  - Dedicated Short-Range Communication (DSRC) radio and hardware
  - CCTV traffic surveillance camera and hardware (not all locations)
  - Network Communications, including fiber optics and managed Ethernet switch

- Mapped
  - **Blue** – Proposed diversion routes
  - **Red** – Planned / Programmed diversion routes in current ICMS

Construction Phase Program Cost Estimate of Diversion Routes

ICM Approach; ICM Integration, CV Ready, communication

Construction Phase (52) Program Cost Estimation									
Corridor	Phase	Controllers + Cabinets	Signal Detection	CCTV Camera	Fiber Optic Communication	Connected Vehicle	Total	Adjustment Factor	Total Per Phase
I-4	**Total**	*$ 5,163,500.00*	*$ 5,163,500.00*	*$ 1,600,685.00*	*$ 3,081,318.63*	*$ 1,032,700.00*	***$ 16,041,703.63***	*1.00*	
	I	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
	II	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
	III	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
	IV	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
I-75	**Total**	*$ 943,000.00*	*$ 943,000.00*	*$ 292,330.00*	*$ 1,205,861.25*	*$ 188,600.00*	***$ 3,572,791.25***	*1.00*	
	I	$ 943,000.00	$ 943,000.00	$ 292,330.00	$ 1,205,861.25	$ 188,600.00		1.00	***$ 3,572,791.25***
I-95	**Total**	*$ 3,726,000.00*	*$ 3,726,000.00*	*$ 1,155,060.00*	*$ 3,176,415.00*	*$ 745,200.00*	***$ 12,528,675.00***	*1.00*	
	I	$ 1,229,580.00	$ 1,229,580.00	$ 381,169.80	$ 1,048,216.95	$ 245,916.00		0.33	***$ 4,134,462.75***
	II	$ 1,229,580.00	$ 1,229,580.00	$ 381,169.80	$ 1,048,216.95	$ 245,916.00		0.33	***$ 4,134,462.75***
	III	$ 1,266,840.00	$ 1,266,840.00	$ 392,720.40	$ 1,079,981.10	$ 253,368.00		0.34	***$ 4,259,749.50***
SR 408	**Total**	*$ 1,150,000.00*	*$ 1,150,000.00*	*$ 356,500.00*	*$ 490,187.50*	*$ 230,000.00*	***$ 3,376,687.50***	*1.00*	
	I	$ 1,150,000.00	$ 1,150,000.00	$ 356,500.00	$ 490,187.50	$ 230,000.00		1.00	***$ 3,376,687.50***
SR 417	**Total**	*$ 3,013,000.00*	*$ 3,013,000.00*	*$ 934,030.00*	*$ 1,284,291.25*	*$ 602,600.00*	***$ 8,846,921.25***	*1.00*	
	I	$ 1,506,500.00	$ 1,506,500.00	$ 467,015.00	$ 642,145.63	$ 301,300.00		0.50	***$ 4,423,460.63***
	II	$ 1,506,500.00	$ 1,506,500.00	$ 467,015.00	$ 642,145.63	$ 301,300.00		0.50	***$ 4,423,460.63***
SR 429	**Total**	*$ 897,000.00*	*$ 897,000.00*	*$ 278,070.00*	*$ 1,147,038.75*	*$ 179,400.00*	***$ 3,398,508.75***	*1.00*	
	I	$ 897,000.00	$ 897,000.00	$ 278,070.00	$ 1,147,038.75	$ 179,400.00		1.00	***$ 3,398,508.75***
SR 528	**Total**	*$ 2,047,000.00*	*$ 2,047,000.00*	*$ 634,570.00*	*$ 1,047,040.50*	*$ 409,400.00*	***$ 6,185,010.50***	*1.00*	
	I	$ 1,023,500.00	$ 1,023,500.00	$ 317,285.00	$ 523,520.25	$ 204,700.00		0.50	***$ 3,092,505.25***
	II	$ 1,023,500.00	$ 1,023,500.00	$ 317,285.00	$ 523,520.25	$ 204,700.00		0.50	***$ 3,092,505.25***
						Program Total	**$ 53,950,297.88**		

Construction Only: **$53,950,297.88**

Comprehensive Program Implementation Cost Estimate of Diversion Routes

ICM Approach; ICM Integration, CV Ready, communication

Construction Phase (52) Program Cost Estimation									
Corridor	Phase	Controllers + Cabinets	Signal Detection	CCTV Camera	Fiber Optic Communication	Connected Vehicle	Total	Adjustment Factor	Total Per Phase
I-4	**Total**	*$ 5,163,500.00*	*$ 5,163,500.00*	*$ 1,600,685.00*	*$ 3,081,318.63*	*$ 1,032,700.00*	***$ 16,041,703.63***	*1.00*	
	I	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
	II	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
	III	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
	IV	$ 1,290,875.00	$ 1,290,875.00	$ 400,171.25	$ 770,329.66	$ 258,175.00		0.25	***$ 4,010,425.91***
I-75	**Total**	*$ 943,000.00*	*$ 943,000.00*	*$ 292,330.00*	*$ 1,205,861.25*	*$ 188,600.00*	***$ 3,572,791.25***	*1.00*	
	I	$ 943,000.00	$ 943,000.00	$ 292,330.00	$ 1,205,861.25	$ 188,600.00		1.00	***$ 3,572,791.25***
I-95	**Total**	*$ 3,726,000.00*	*$ 3,726,000.00*	*$ 1,155,060.00*	*$ 3,176,415.00*	*$ 745,200.00*	***$ 12,528,675.00***	*1.00*	
	I	$ 1,229,580.00	$ 1,229,580.00	$ 381,169.80	$ 1,048,216.95	$ 245,916.00		0.33	***$ 4,134,462.75***
	II	$ 1,229,580.00	$ 1,229,580.00	$ 381,169.80	$ 1,048,216.95	$ 245,916.00		0.33	***$ 4,134,462.75***
	III	$ 1,266,840.00	$ 1,266,840.00	$ 392,720.40	$ 1,079,981.10	$ 253,368.00		0.34	***$ 4,259,749.50***
SR 408	**Total**	*$ 1,150,000.00*	*$ 1,150,000.00*	*$ 356,500.00*	*$ 490,187.50*	*$ 230,000.00*	***$ 3,376,687.50***	*1.00*	
	I	$ 1,150,000.00	$ 1,150,000.00	$ 356,500.00	$ 490,187.50	$ 230,000.00		1.00	***$ 3,376,687.50***
SR 417	**Total**	*$ 3,013,000.00*	*$ 3,013,000.00*	*$ 934,030.00*	*$ 1,284,291.25*	*$ 602,600.00*	***$ 8,846,921.25***	*1.00*	
	I	$ 1,506,500.00	$ 1,506,500.00	$ 467,015.00	$ 642,145.63	$ 301,300.00		0.50	***$ 4,423,460.63***
	II	$ 1,506,500.00	$ 1,506,500.00	$ 467,015.00	$ 642,145.63	$ 301,300.00		0.50	***$ 4,423,460.63***
SR 429	**Total**	*$ 897,000.00*	*$ 897,000.00*	*$ 278,070.00*	*$ 1,147,038.75*	*$ 179,400.00*	***$ 3,398,508.75***	*1.00*	
	I	$ 897,000.00	$ 897,000.00	$ 278,070.00	$ 1,147,038.75	$ 179,400.00		1.00	***$ 3,398,508.75***
SR 528	**Total**	*$ 2,047,000.00*	*$ 2,047,000.00*	*$ 634,570.00*	*$ 1,047,040.50*	*$ 409,400.00*	***$ 6,185,010.50***	*1.00*	
	I	$ 1,023,500.00	$ 1,023,500.00	$ 317,285.00	$ 523,520.25	$ 204,700.00		0.50	***$ 3,092,505.25***
	II	$ 1,023,500.00	$ 1,023,500.00	$ 317,285.00	$ 523,520.25	$ 204,700.00		0.50	***$ 3,092,505.25***
						Program Total	**$ 53,950,297.88**		

Construction + Design, CEI, and Post Design: **$67,798,080.86**

Comprehensive Program Operation Cost Estimate of Diversion Routes

Comprehensive Program Operation Cost Estimation			
Operation FY (Start)	**Yearly Operation Fee (82)**	**Operation Cost (FY Start to 2028)**	**Total Operation Cost**
			$ 7,800,000.00
2020	$ 300,000.00	**$ 2,400,000.00**	
2021	$ 300,000.00	**$ 2,100,000.00**	
2022	$ 300,000.00	**$ 1,800,000.00**	
2023	$ 300,000.00	**$ 1,500,000.00**	
			$ 2,100,000.00
2021	$ 300,000.00	**$ 2,100,000.00**	
			$ 5,400,000.00
2020	$ 300,000.00	**$ 2,400,000.00**	
2022	$ 300,000.00	**$ 1,800,000.00**	
2024	$ 300,000.00	**$ 1,200,000.00**	
			$ 1,500,000.00
2023	$ 300,000.00	**$ 1,500,000.00**	
			$ 1,500,000.00
2025	$ 300,000.00	**$ 900,000.00**	
2026	$ 300,000.00	**$ 600,000.00**	
			$ -
2029	$ 300,000.00	**$ -**	
			$ 300,000.00
2027	$ 300,000.00	**$ 300,000.00**	
2028	$ 300,000.00	**$ -**	
		Program Total	**$ 18,600,000.00**

Additional Operations Costs (over 10-year period): **$18,600,000.00**

M/TPO Program Projects Identified for FDOT Funding

Local Agency/TPO	Comprehensive Program Implementation				
	Design FY	In-House Timesheet (31)	Design Fee (32)	Construction FY	Construction Fee (52)
Lake County					
ATMS Phase I	2019	$ 5,000.00	$ 645,000.00	2020	$ 4,300,000.00
ATMS Phase II	2023	$ 5,000.00	$ 645,000.00	2024	$ 4,300,000.00
ATMS Phase III	2025	$ 5,000.00	$ 450,000.00	2026	$ 3,000,000.00
River to Sea TPO					
SR 15 (US 17/92) Sun Rail/Bus Preemption	2024	$ 5,000.00	$ 34,500.00	2025	$ 230,000.00
US 1 ICMS Diversion Route Upgrades	2024	$ 5,000.00	$ 396,089.33	2025	$ 2,640,595.50
MetroPlan Orlando TPO					
US 192 Adaptive Signal System (Phase II)	2019	$ 5,000.00	$ 93,712.50	2020	$ 624,750.00
SR 436 Adaptive Signal System	2018	$ 5,000.00	$ 30,600.00	2019	$ 204,000.00
Osceola Parkway Adaptive Signal System	2019	$ 5,000.00	$ 22,950.00	2020	$ 153,000.00
Osceola Co. ATMS Phase IV	2020	$ 5,000.00	$ 84,888.75	2021	$ 565,925.00
Orange County ATMS Phase IV	2022	$ 5,000.00	$ 55,365.00	2023	$ 369,100.00
Seminole County ATMS	2021	$ 5,000.00	$ 46,785.00	2022	$ 311,900.00
City of Kissimmee ATMS Phase I	2018	$ 5,000.00	$ 7,500.00	2019	$ 50,000.00
City of Kissimmee ATMS Phase II	2022	$ 5,000.00	$ 67,500.00	2023	$ 450,000.00
SR 50 Adaptive Signal System	2021	$ 5,000.00	$ 42,075.00	2022	$ 280,500.00
Downtown DMS Expansion	2022	$ 5,000.00	$ 15,375.00	2023	$ 102,500.00
Osceola County ATMS Phase V	2018	$ 5,000.00	$ 75,000.00	2019	$ 500,000.00
Conroy Rd Adaptive Signal System	2018	$ 5,000.00	$ 13,387.50	2019	$ 89,250.00
John Young Pkwy Adaptive Signal System	2021	$ 5,000.00	$ 36,337.50	2022	$ 242,250.00
Narcoossee Rd Adaptive Signal System	2019	$ 5,000.00	$ 13,387.50	2020	$ 89,250.00
Osceola County ATMS Phase VI	2025	$ 5,000.00	$ 75,000.00	2026	$ 500,000.00
SpaceCoast TPO **					
	2027	$ 5,000.00	$ 240,000.00	2028	$ 1,600,000.00
Ocala/Marion TPO **					
	2027	$ 5,000.00	$ 150,000.00	2028	$ 1,000,000.00

M/TPO Program Projects Identified for FDOT Funding – FY Breakdown

Fiscal Year-by-Year Planning Breakdown				
FY	Implementation		Operation	
	No. of Projects	FY Total Cost	Projects in Operation	Total Operation Cost
2018	4	$ 146,487.50	0	$ -
2019	8	$ 1,782,625.00	0	$ -
2020	5	$ 5,833,588.75	2	$ 600,000.00
2021	4	$ 777,715.00	3	$ 900,000.00
2022	6	$ 1,116,355.00	4	$ 1,200,000.00
2023	4	$ 1,708,760.00	5	$ 1,500,000.00
2024	3	$ 4,745,000.00	8	$ 2,400,000.00
2025	4	$ 535,000.00	9	$ 2,700,000.00
2026	2	$ 3,880,000.00	11	$ 3,300,000.00
2027	2	$ -	13	$ 3,900,000.00
2028	2	$ -	13	$ 3,900,000.00
	Total Program Cost	$ 20,525,531.25	Total Operation Cost	$ 20,400,000.00

Implementation Cost: **$20,525,531.25**

Operation Cost: **$20,400,000.00**

TSM&O and the Central Florida MPO Alliance

Next Steps

1. Prioritize diversion routes

2. At **April 13th CFMPOA meeting**, discuss diversion route effort and identification process

3. At **July 13th CFMPOA meeting**, provide list of projects for inclusion in the Regional Prioritized Projects List (PPL)

Questions?

TSM&O Strategy Guide

David Williams, VHB

Transportation Systems Management & Operations

TSM&O Strategy Guide

- **Goal**: further integrate TSM&O into the FDOT planning process

- **Objective**: provide relevant TSM&O strategies for a given transportation issue

TSM&O Strategy Guide

- Second Draft developed

TSM&O Strategy Guide

- New content:
  - 17 additional TSM&O strategies
  - 15 additional issues / considerations
  - Capital Costs – relative ($ to $$$)
  - Operating Costs – relative ($ to $$$)

Questions?

Signal Technicians Program at Orange Technical College – Update

David Williams, VHB

Signal Technician Program

- Provided formal letter indicating *signal technician need* to Orange Technical College
- Awaiting feedback from the College
- Diploma required?

Questions?

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FDOT

D5 TSM&O Consortium Meeting

April 05, 2018

welcome to the
future

Autonomous & Connected Vehicles

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

Shared Mobility

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- Potential to reduce fleet size by 90 percent
- Shared auto-ownership impacts
- Internet of things – big data

UBER

lyft

Smart Cities

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- Endless possibilities for a connected future

Science or Fiction?

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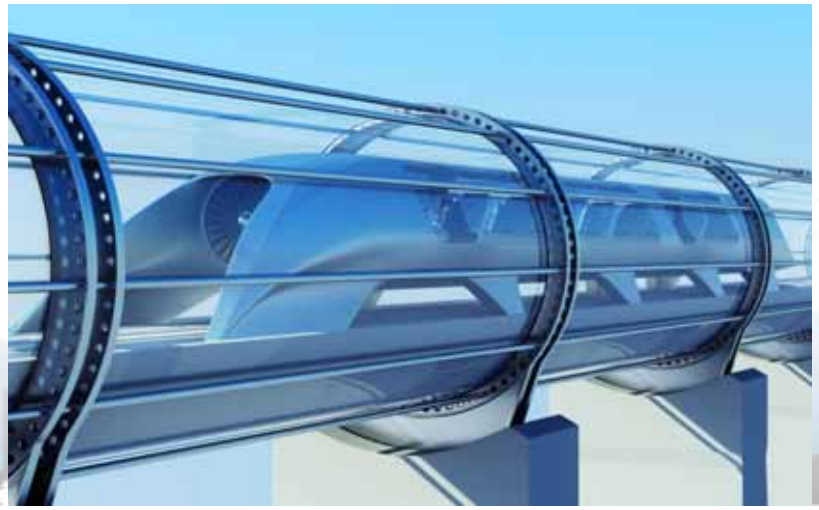
Straddling Bus ▲ ▼ Transit X

Helium Airships ▲ ▼ Hyperloop



Science or Fiction?

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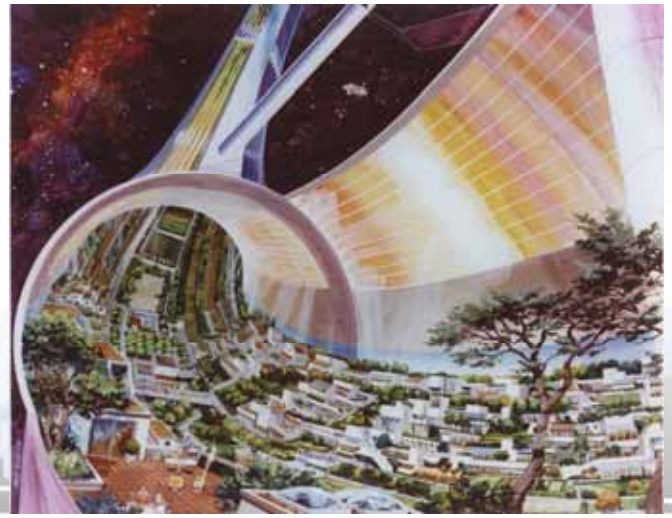
Drone Hub ▲ ▼ Space Colony



Space Tourism – Vacation of the Future ▼

Transformation is Real

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Sorting Facts from Fiction

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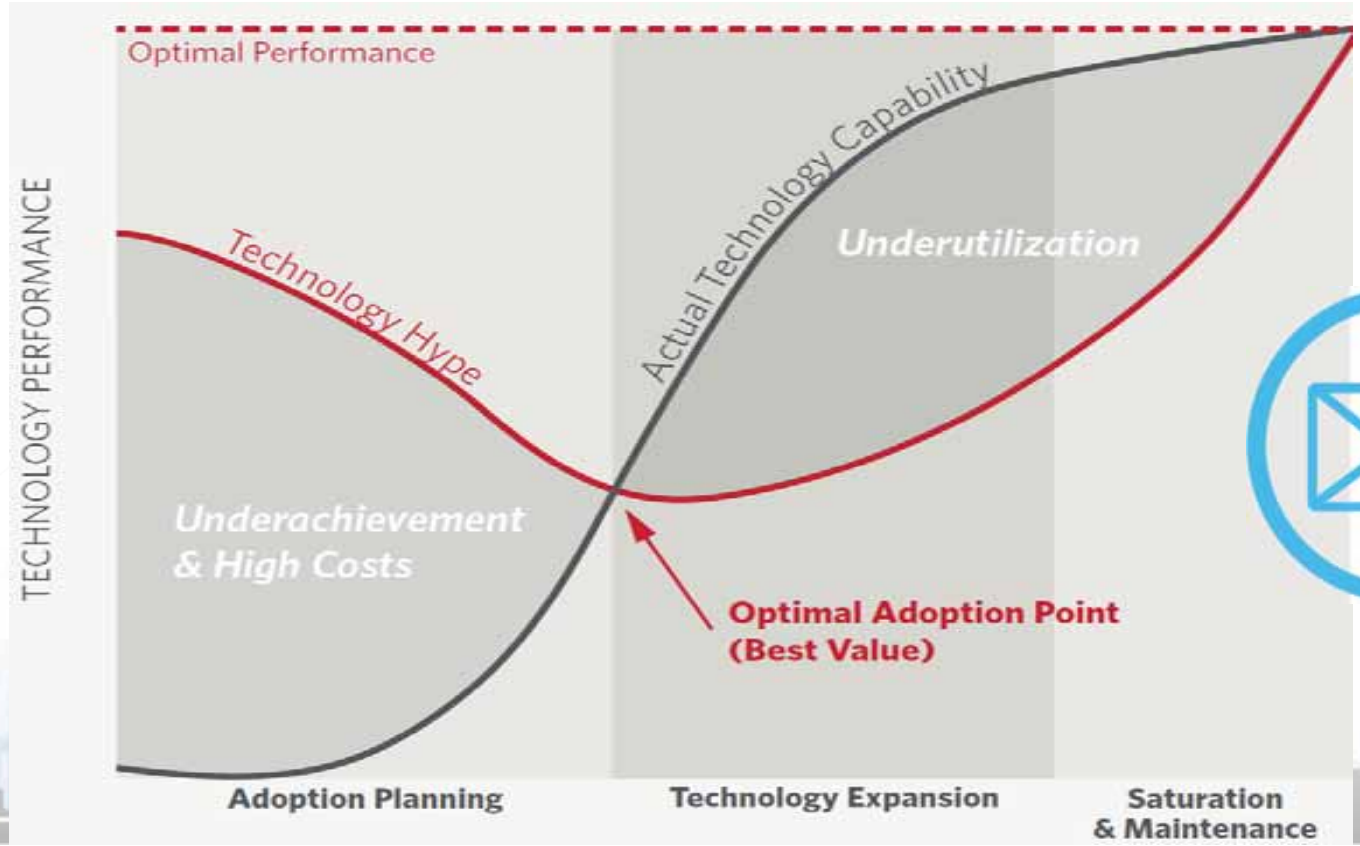
- Optimal adoption point for best value
- Cutting edge vs. bleeding edge



Why Now?

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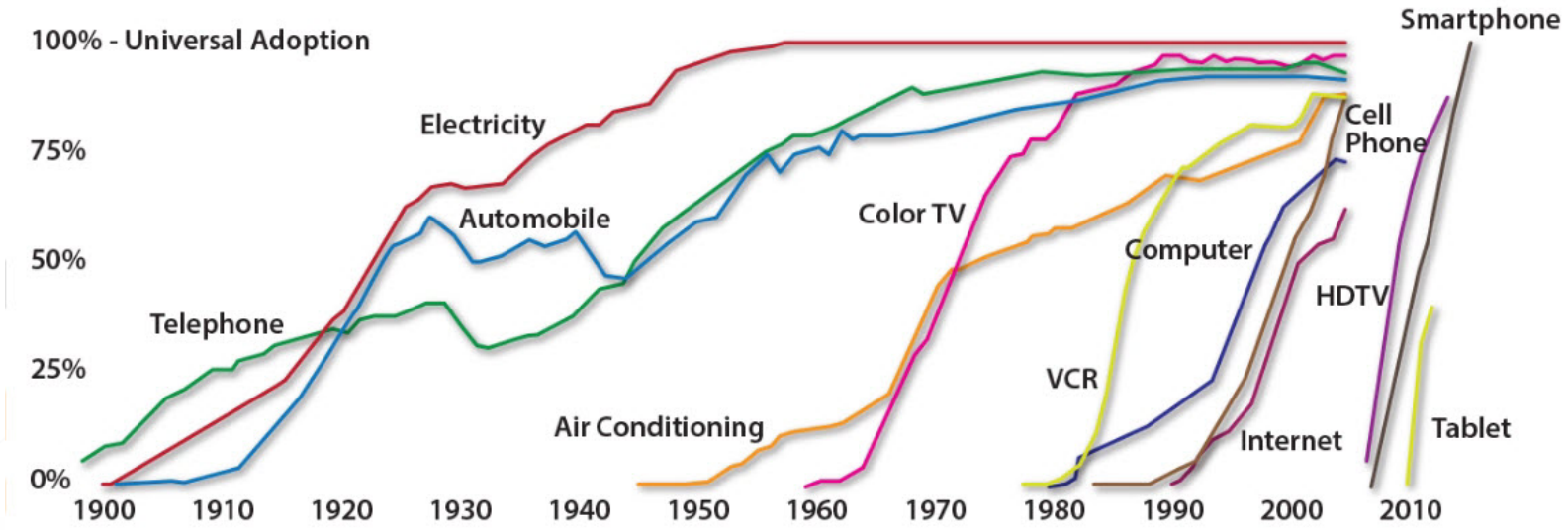
- Moore's law – computing power doubles every 2 years



Market Readiness

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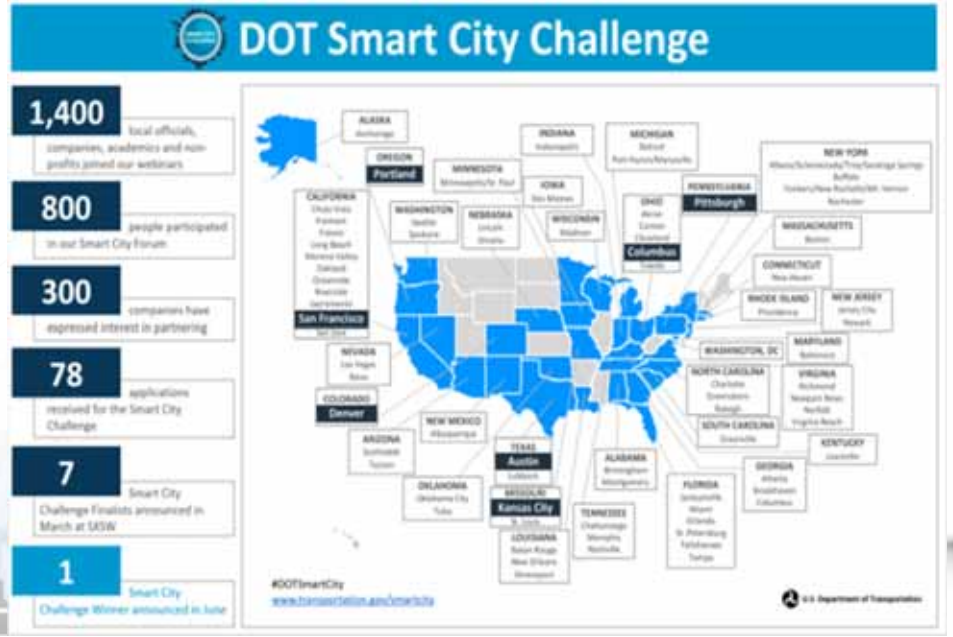
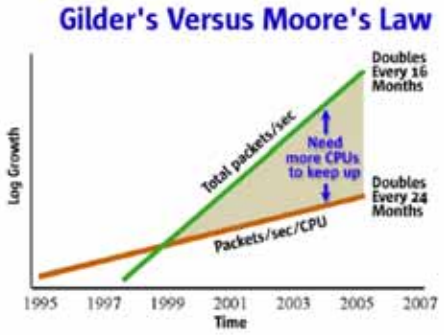
- 78 cities participated in Smart Cities challenge
- 34 States enacted autonomous vehicle legislation since 2012
- Most new vehicles sold today have advanced features





Source: The Net Effect

Market Readiness

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Decision Making Challenge

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- Traditional tools and methods are falling short of answering policy questions of tomorrow
- How to prepare for the unknown?

Introducing TransFuture

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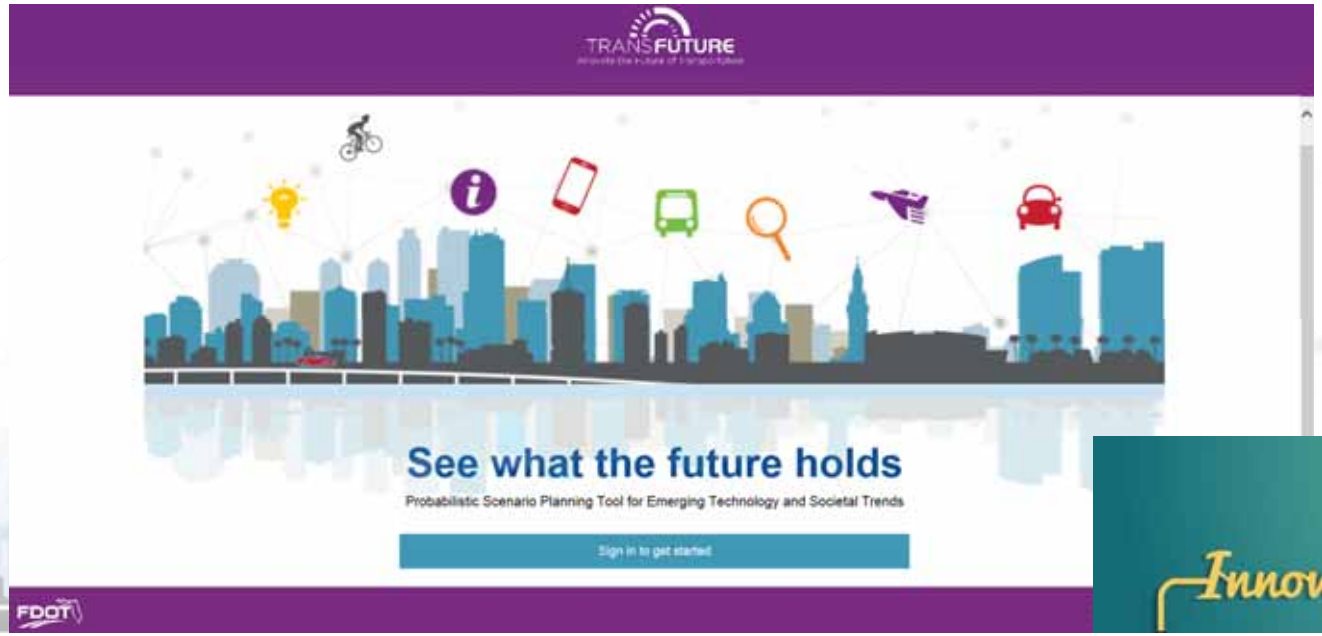
- Next-gen scenario planning tool
- Prepare for multiple futures
- Explicitly account for uncertainty
- Support a desirable future by incorporating flexibility
- Add-on lens to improve decision-making



Planning for Multiple Futures

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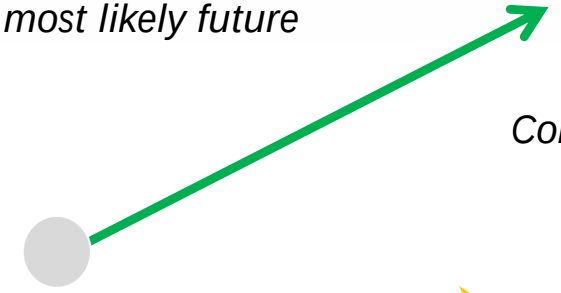
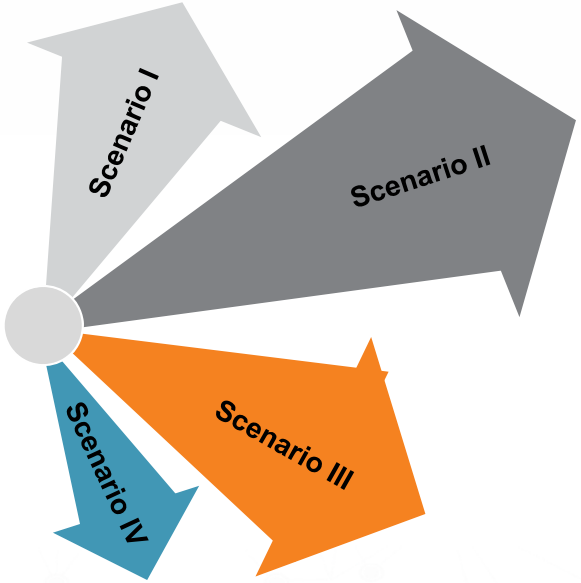
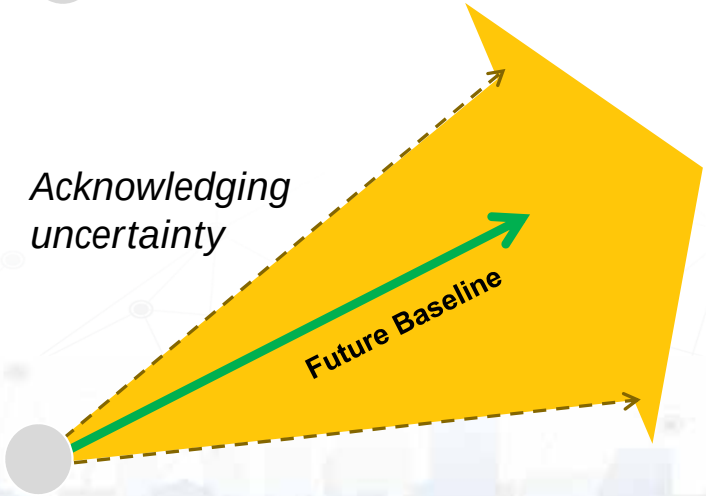
Traditional planning for most likely future

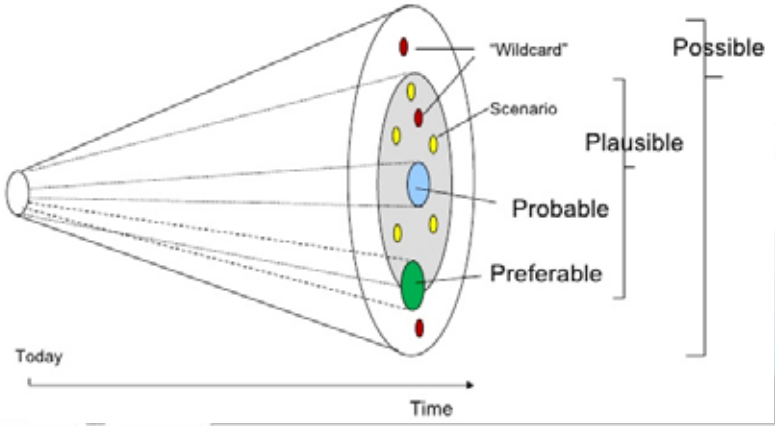


Considering multiple futures and uncertainties



Acknowledging uncertainty





Composite Uncertainty Cone

Development Approach

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Identify Trends	**Quantify Trends**	**Deterministic to Probabilistic**
Understand Uncertainties	**Make Informed Decisions**	**Implementation Plan**

Emerging Trends

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Changing Demographics	Improved Technology	Shifting User Preferences	Improved Travel Options
• Millennial travel behavior • Aging population • Generation Z	• Automated vehicles • EVs • Workplace automation • Improved user information & navigation • Smart City	• Urbanization • Shift from individual ownership to fleet ownership • Telecommuting • E-commerce & delivery options	• Better walking and biking options • Improved public transit • Shared mobility

Sample Literature

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- 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

Automated Vehicles

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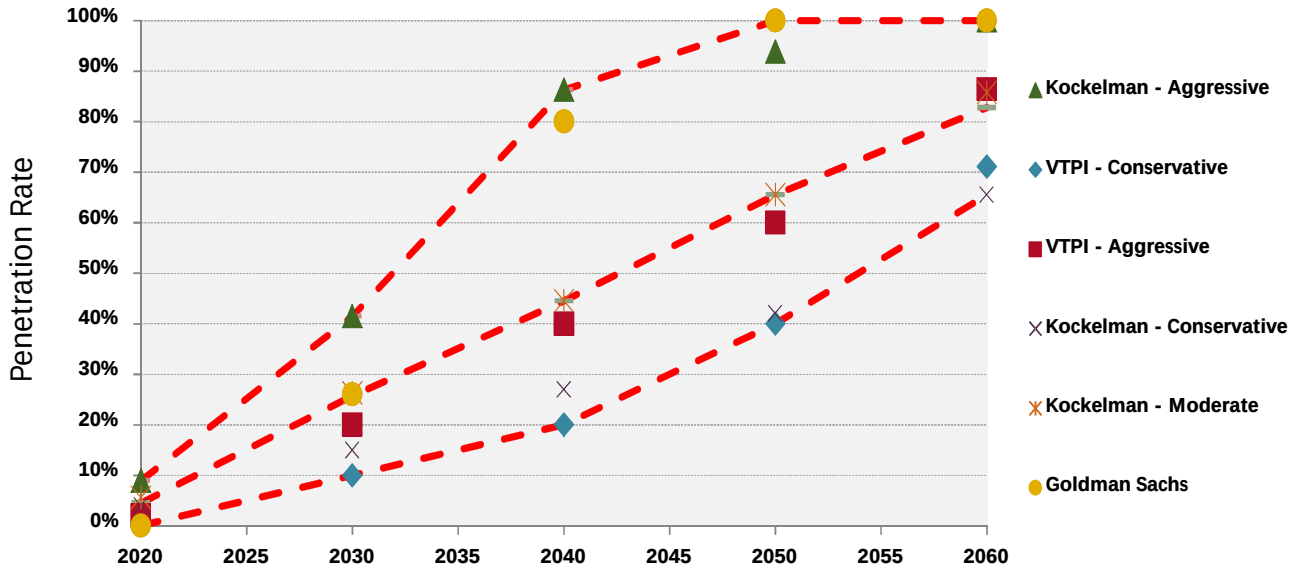
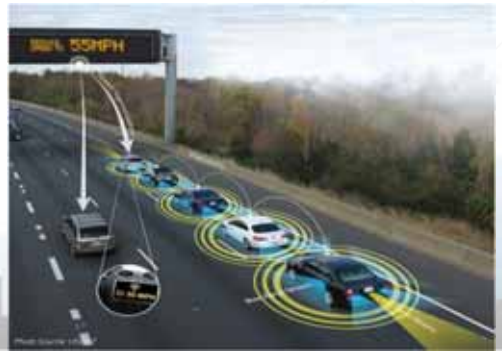
- Capacity and demand increase



Market penetration

Early adoption - trucks?

Connected features in cars



Shared Mobility

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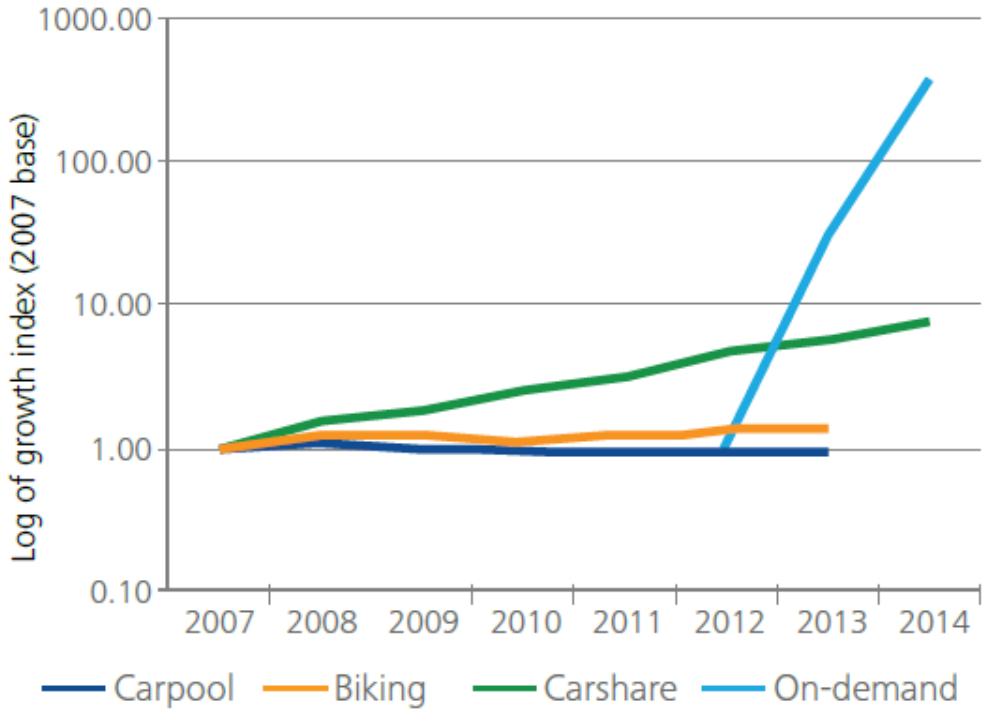
- Reduction in auto ownership
- Potential increase in trips
- Fleet size reduction



Workplace Automation

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- Jobs at risk for automation
- Transformation of the labor force
- Jobs of Generation Z (1995-today)

Conceptual Framework

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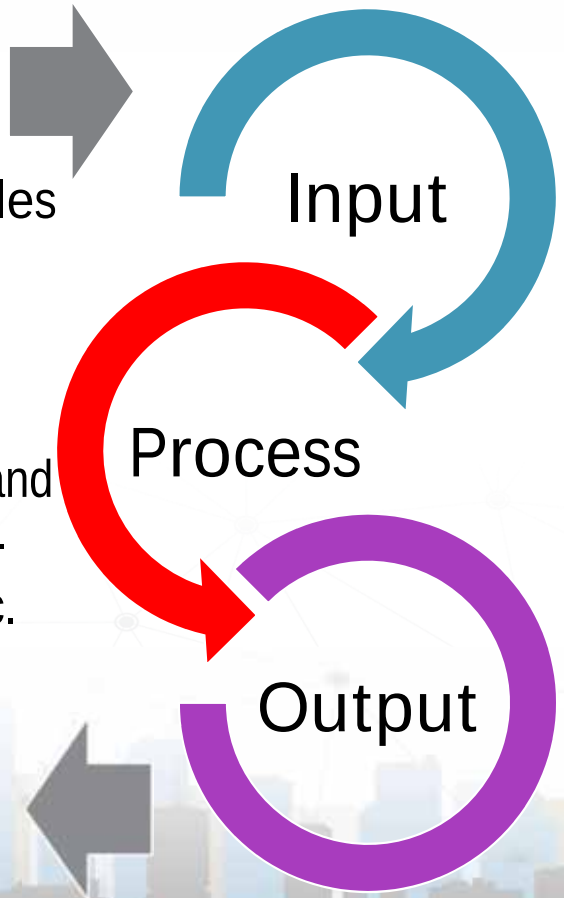
Frontend

- Regional travel demand model files
- Define scenarios



Backend

- Regression analysis
- Elasticity analysis
- Monte Carlo Simulation

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

User Interface

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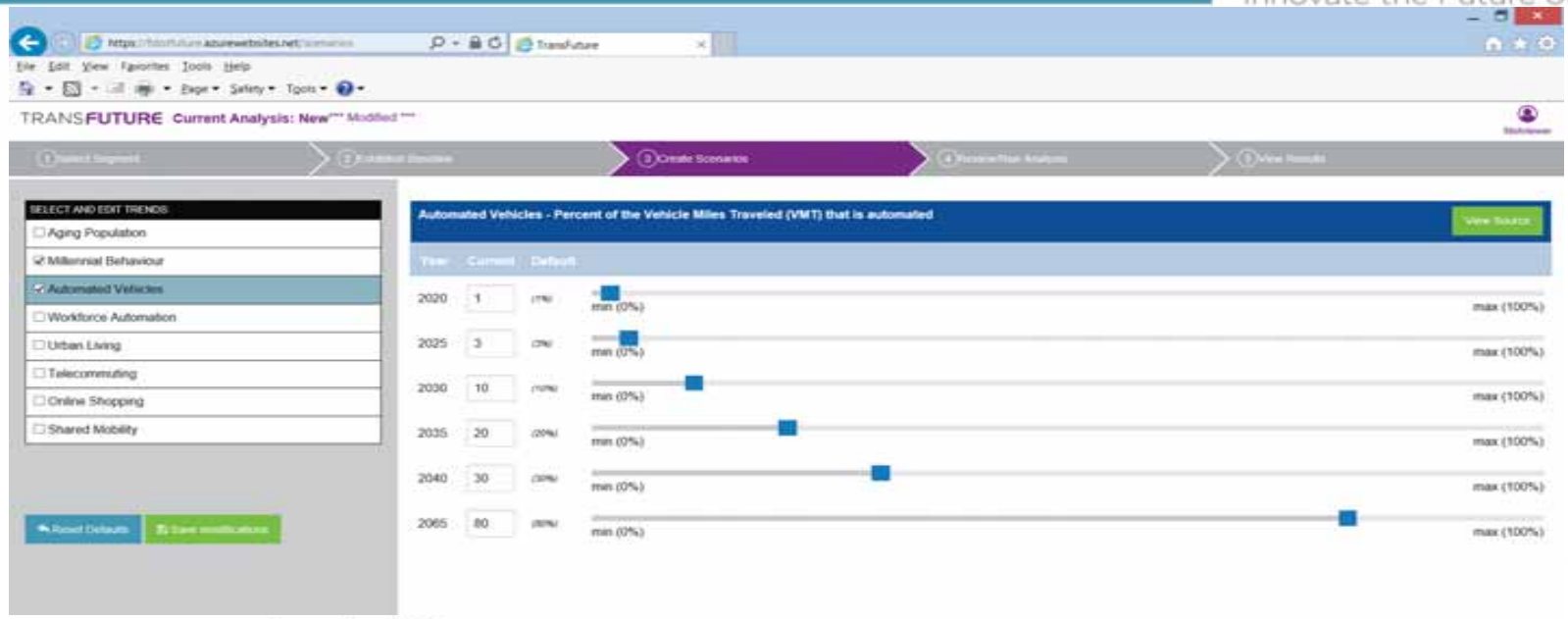

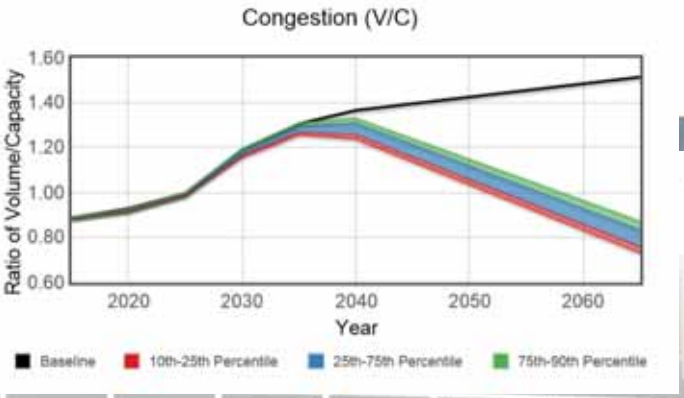

Methodology Framework

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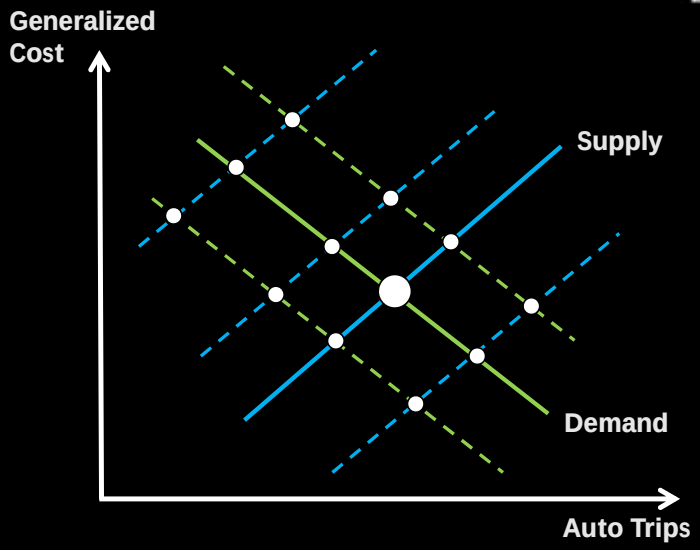

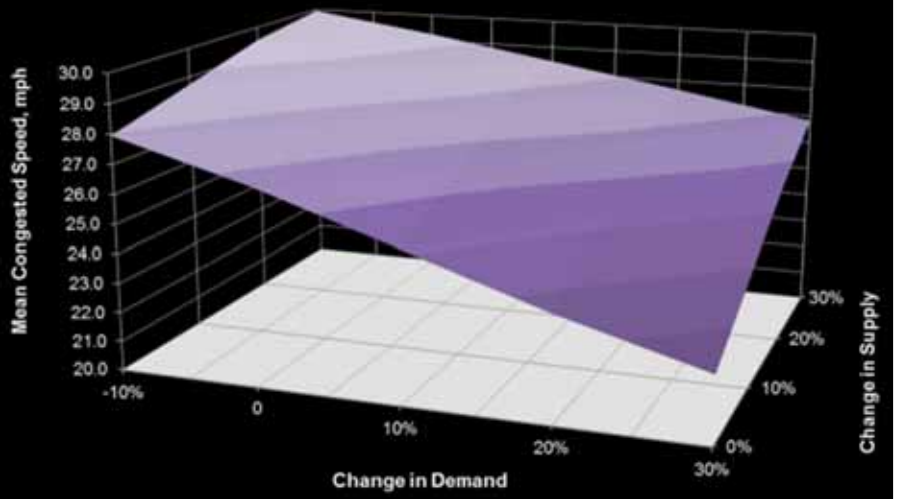

- N-dimensional supply-demand surface
- Quantifying impacts of emerging trends

Accounting for Uncertainty

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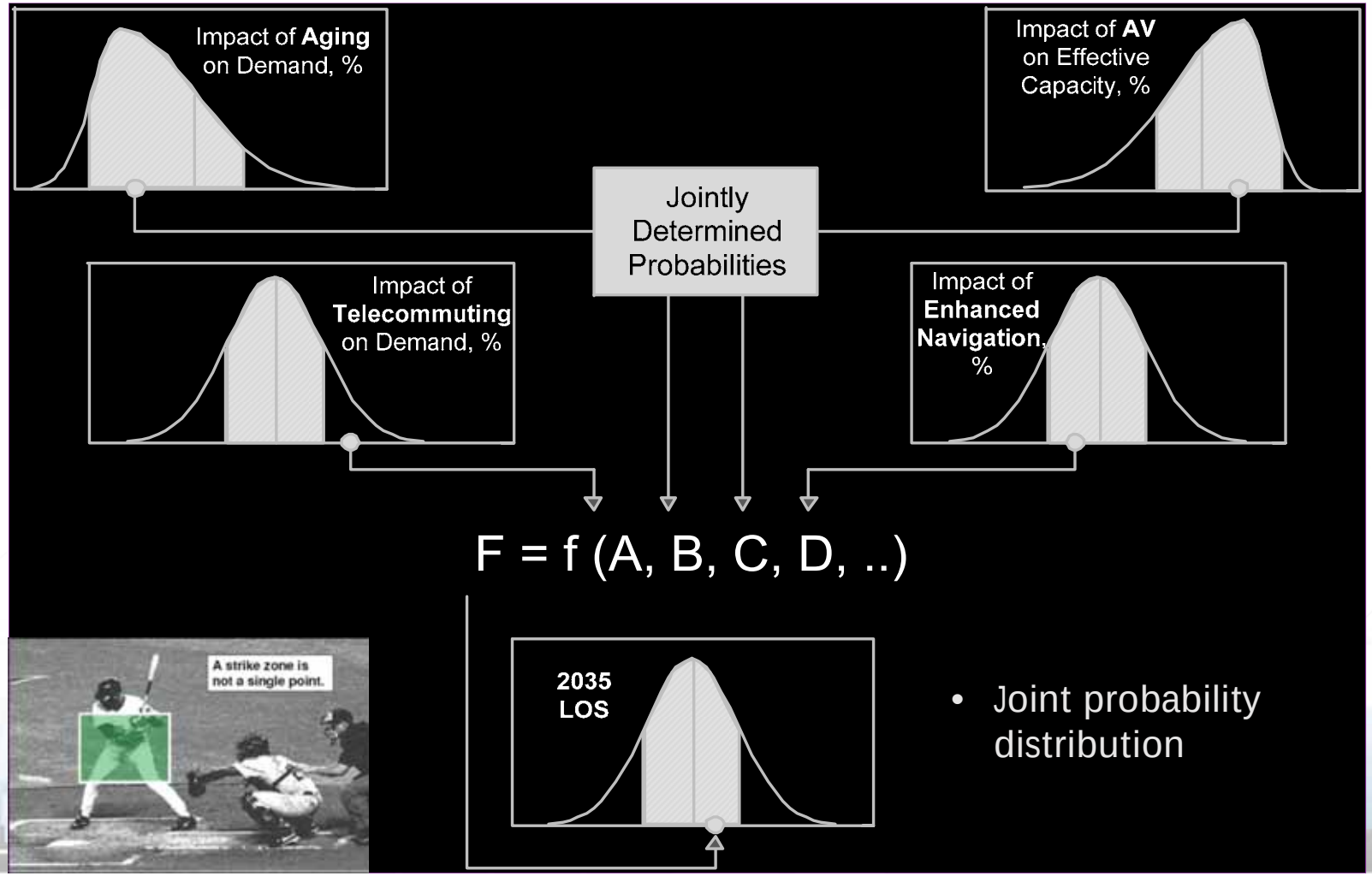

- Joint probability distribution

Future Corridors Application

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Hypothetical Corridor Analysis

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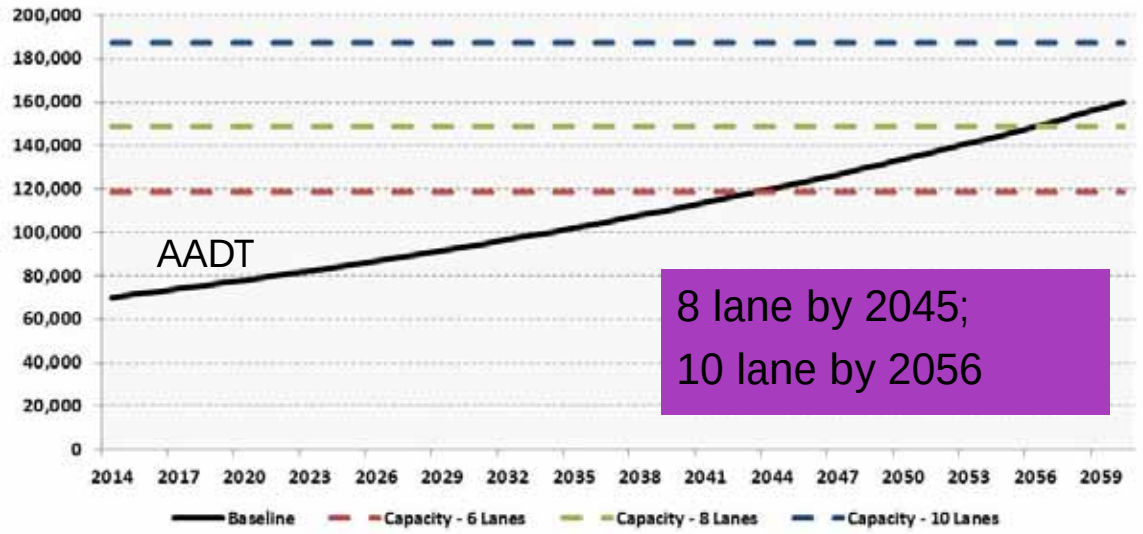
Baseline Scenario



10-lane capacity

8-lane capacity

6-lane capacity

Hypothetical Corridor Analysis

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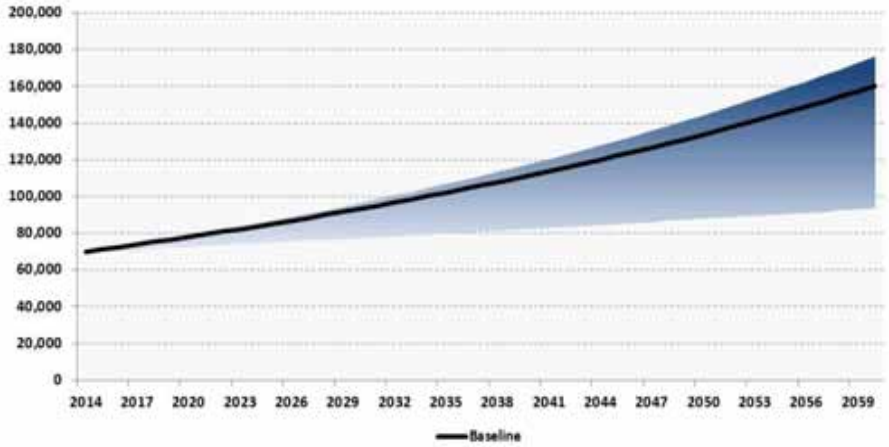
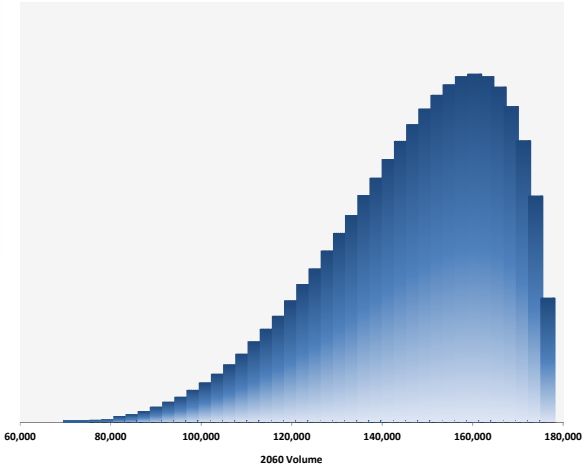
Build Scenario



AV/ CV Market penetration = 2035 – 10%; 2060 – 50%



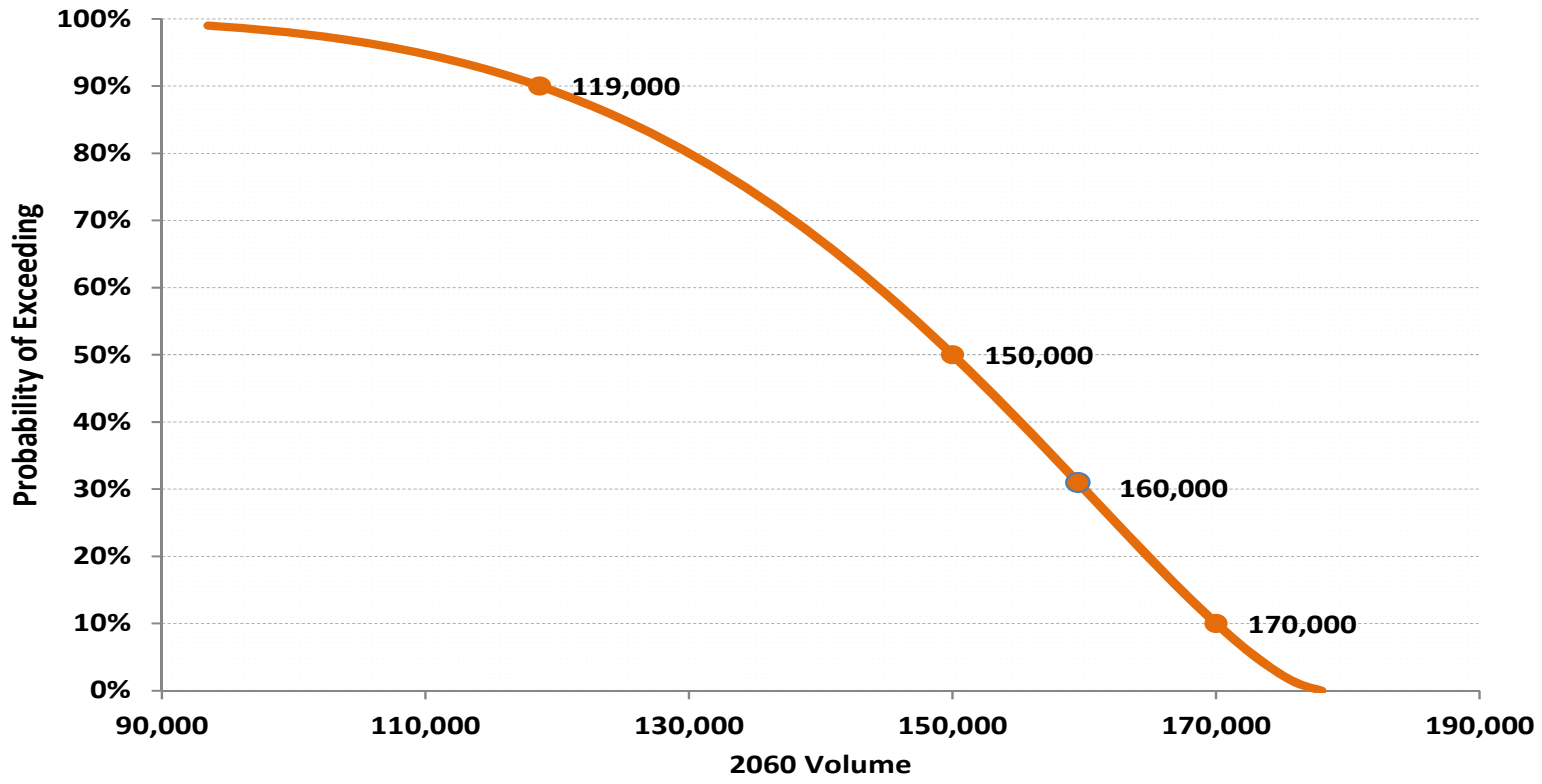
Two emerging trends considered:
Aging population - Reduced demand
Automated vehicles - Capacity increase, Demand increase

Hypothetical Corridor Analysis

TRANSFUTURE
Innovate the Future of Transportation

Build Scenario

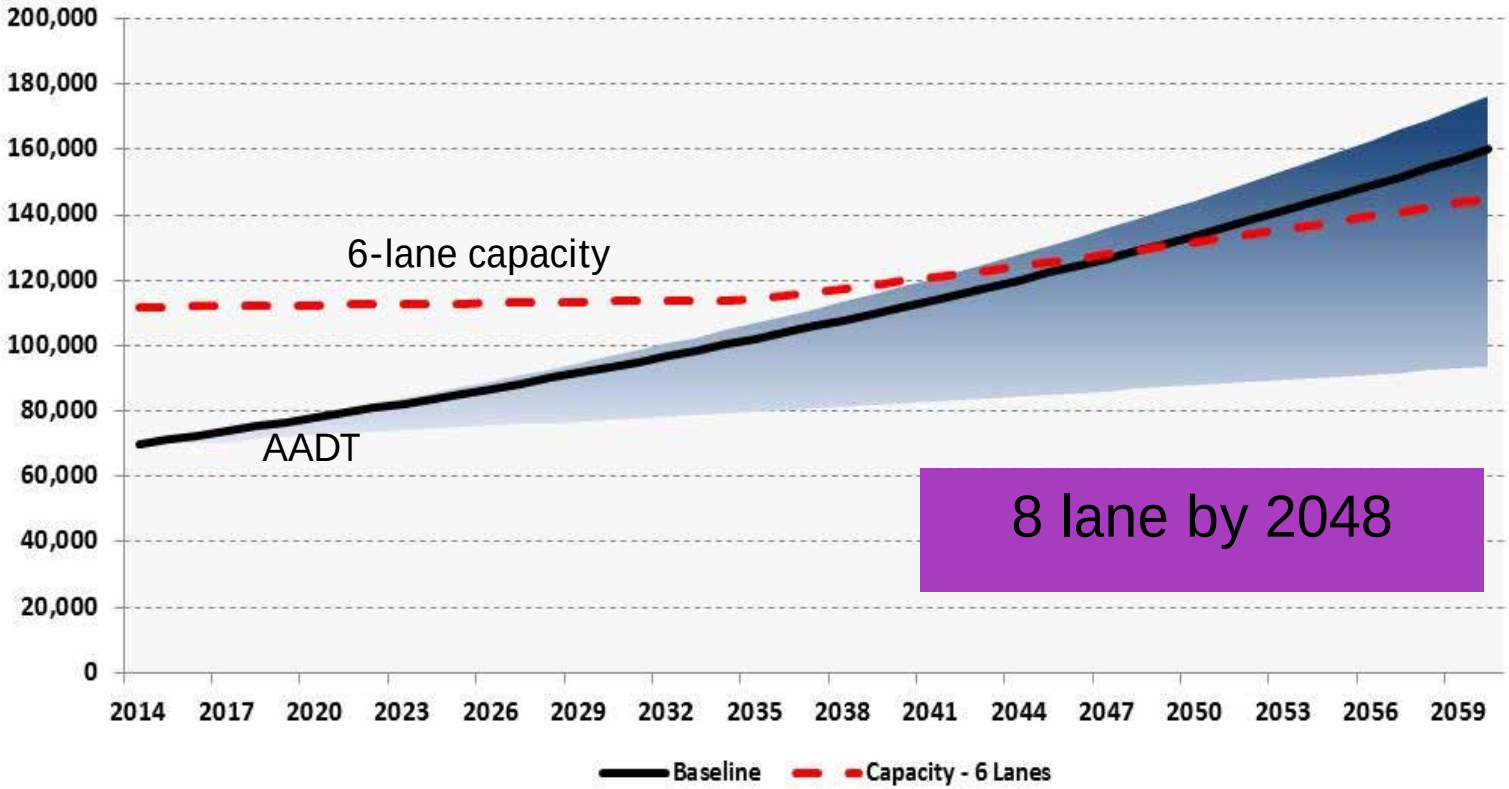
- We are 90% confident that the 2060 AADT will be <170,000



Hypothetical Corridor Analysis

TRANSFUTURE
Innovate the Future of Transportation

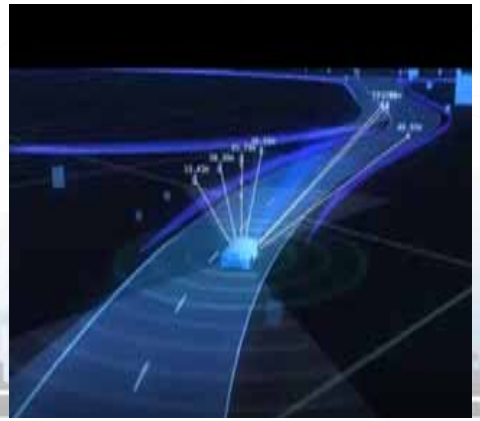
Build Scenario



New Paradigm

TRANSFUTURE
Innovate the Future of Transportation

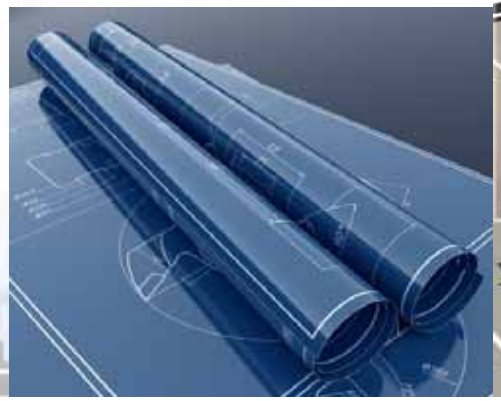
- Don’t over build – cost savings (value of stranded assets)
- Preserve ROW for potential future need
- Invest in technology – future proof investments
  - Cable, power, machine vision (reference markers), data management



New Paradigm

TRANSFUTURE
Innovate the Future of Transportation

- Design flexibly – modular lanes
  - Dynamic lane markings
  - Right pavement design
  - Full depth shoulder
- Technology roadmap



Innovate the Future

TRANSFUTURE
Innovate the Future of Transportation

“The best way to predict the future is to invent it”

- Alan Kay, Computer Scientist

CONTACTS

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APA's Automated Vehicle Symposium

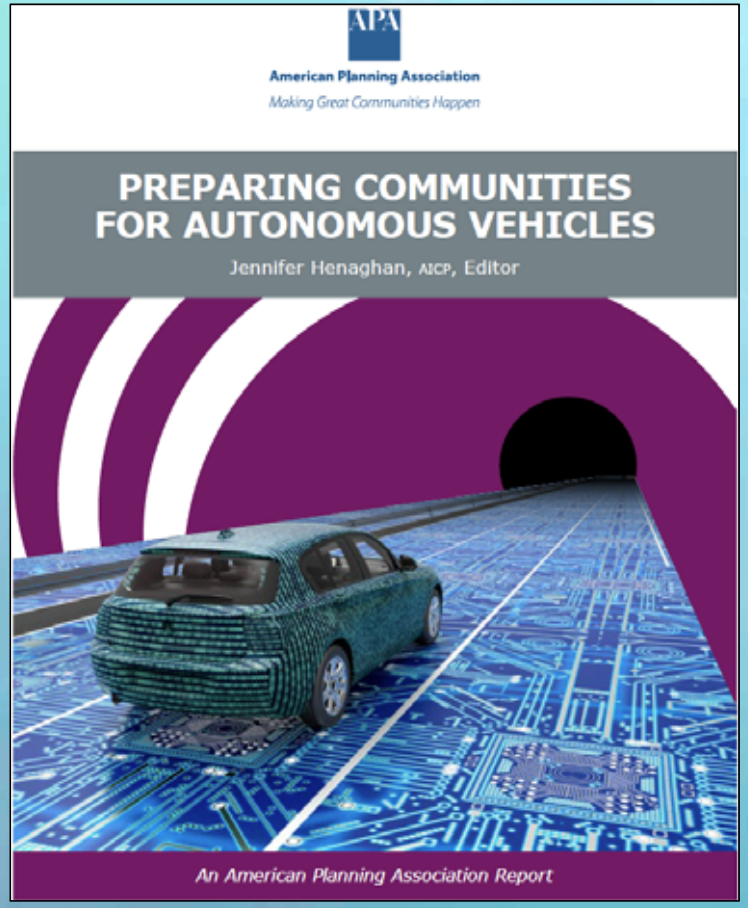
Amy Sirmans, P.E.

FDOT District Five

Planning & Environmental Management Office (PLEMO)

Transportation Systems Management & Operations

Preparing Communities for Autonomous Vehicles



"On October 6, 2017, 85 thought leaders in planning, transportation, and related fields gathered at the National League of Cities (NLC) headquarters in Washington, D.C., to discuss how to plan for the impacts of autonomous vehicles (AVs) on cities and regions."

Preparing Communities for Autonomous Vehicles

"In 2016, distracted driving claimed nearly 40,000 lives on American roads."

11 of the largest automakers plan to have fully autonomous vehicles on the road between now and 2021

2018	2019	2020	2021
• Tesla • GM		• Honda • Toyota • Renault-Nissan • Hyundai	• Ford • Volvo • Daimler • Fiat-Chrysler • BMW

Source: venturebeat.com/2017/06/04/self-driving-car-timeline-for-11-top-automakers

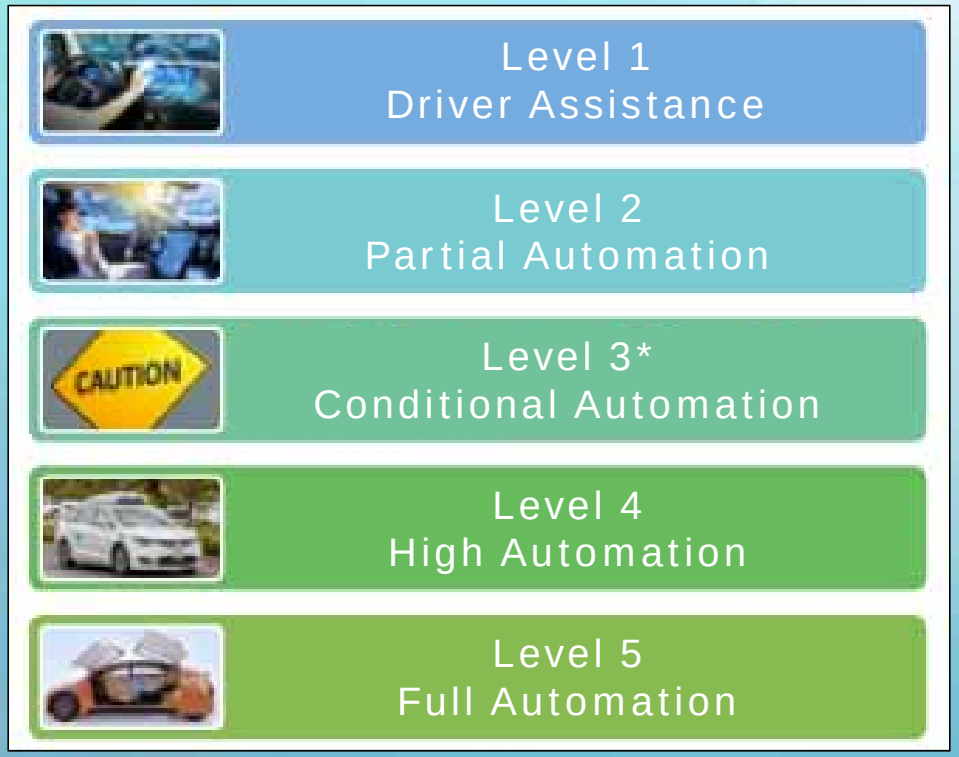
Preparing Communities for Autonomous Vehicles

Shuttle services, such as the Navya shuttle shown in testing at M-City, can connect residents in low-density areas to employment hubs.

- How will AVs impact:
  - Transit
  - Equity and Access
  - Elderly / Transportation-Disadvantaged
  - Workforce
  - Parking
  - Parks / Recreational Spaces
  - Comprehensive Planning
  - Zoning / Land Use

Levels of Automation

Generally based on Society of Automotive Engineers (SAE) Levels of Automation



*Level 3 – Human drivers must be prepared to take control at all times

- Adaptive Cruise Control and Parking Assist
- Tesla's autopilot; car takes over wheel & pedals (driver still in control)
- Human drivers serve as backup; autonomous under certain conditions
- Google / Waymo; human drivers optional
- Human drivers never necessary; no steering wheel

Federal AV Legislation

- House passed “SELF Drive Act” (H.R. 3388) Sept 2017
- Senate sent “AV START Act” to floor (S. 1885) in Nov 2017
  - **Provide limited number of exemptions over next 4 years from existing vehicle standards to accommodate AV testing (numbers vary by Bill)**

- **Federal Jurisdiction**
  - AV Design
  - AV Construction
  - AV Performance
- **State Jurisdiction**
  - AV Sales
  - AV Repairs

- “Smart Cities and Communities Act” (H.R. 3895 / S. 1904) Introduced
  - **Creates a new demonstration grant and technical assistance program for new tools (infrastructure, V2V communication, etc.)**

Federal AV Policy

U.S. DOT published new guidance in Sept 2017

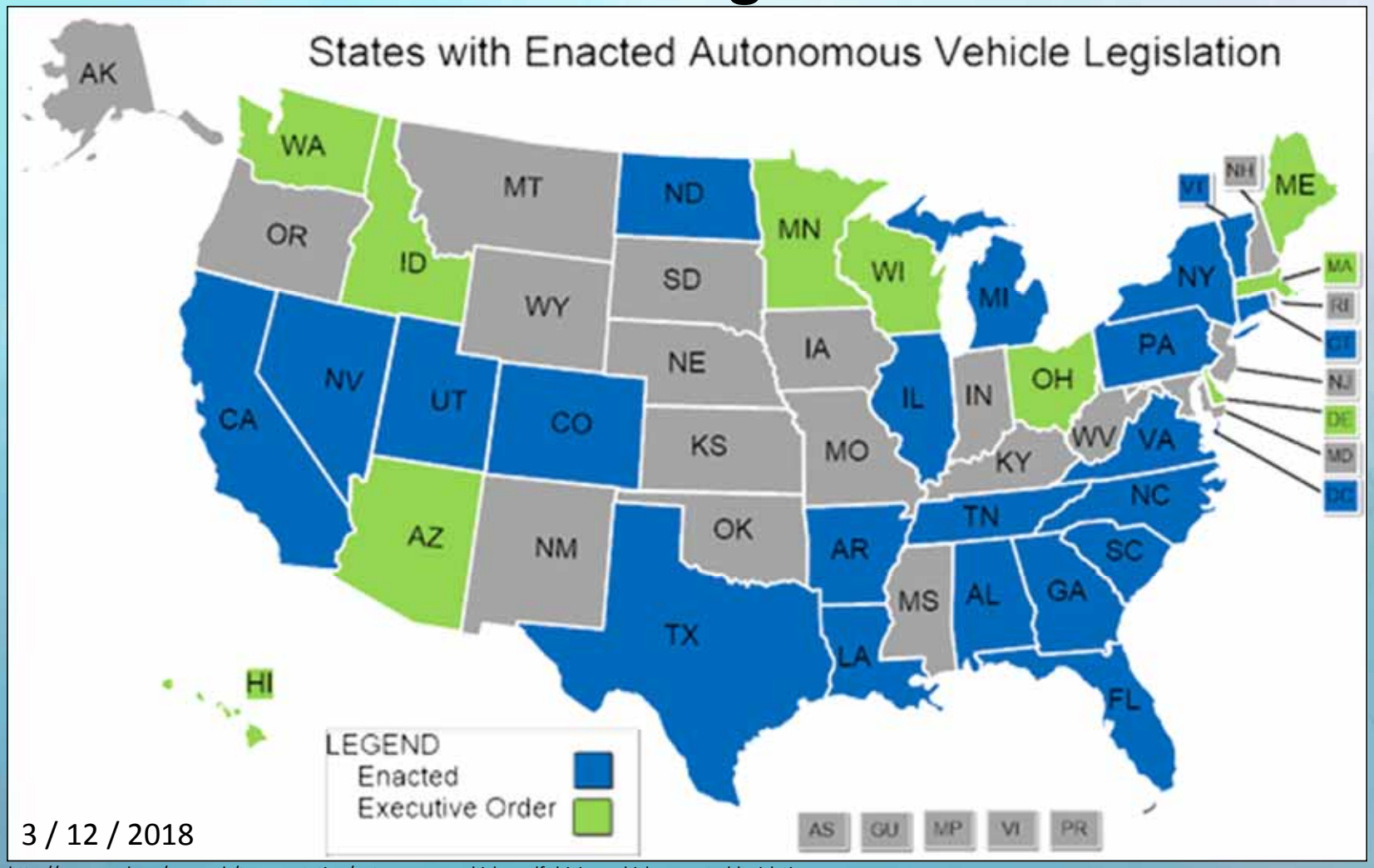
“Automated Driving Systems: A Vision for Safety 2.0”

State AV Legislation

- Since 2012, 41 states and the District of Columbia have considered AV-related legislation
- As of March 2018, 22 states have passed legislation
  - Governors in an additional 9 states have issued executive orders

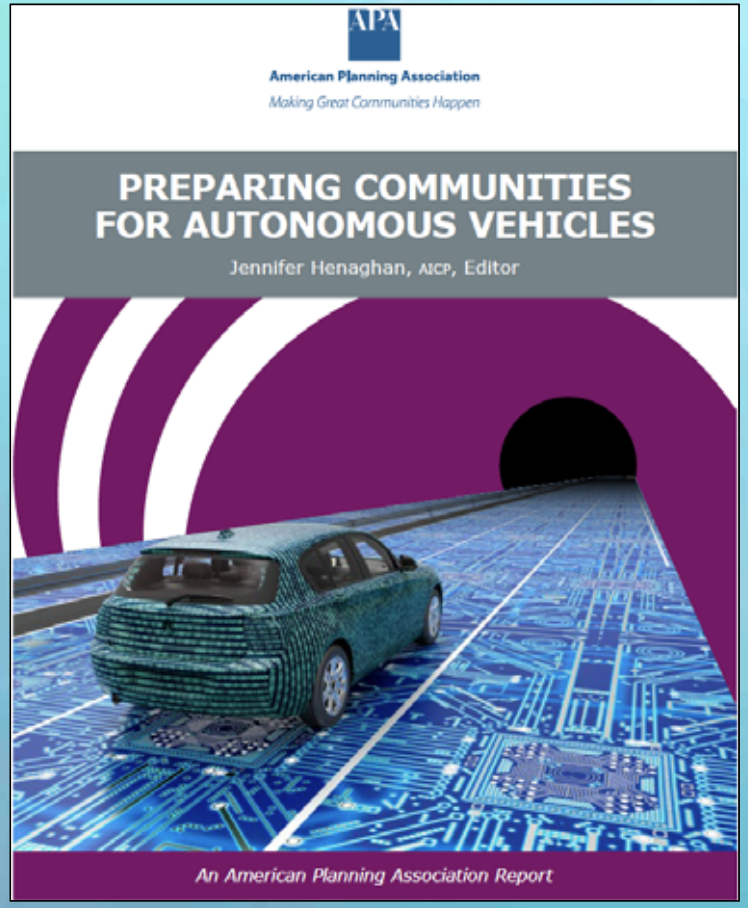
- [During the 2017/18 Florida Session]:
  - A new bill was introduced, but withdrawn:
    - Exempted drivers from having to be physically present in a *fully autonomous vehicle*
    - Set insurance requirements

State AV Legislation



http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx

Notes from the Symposium



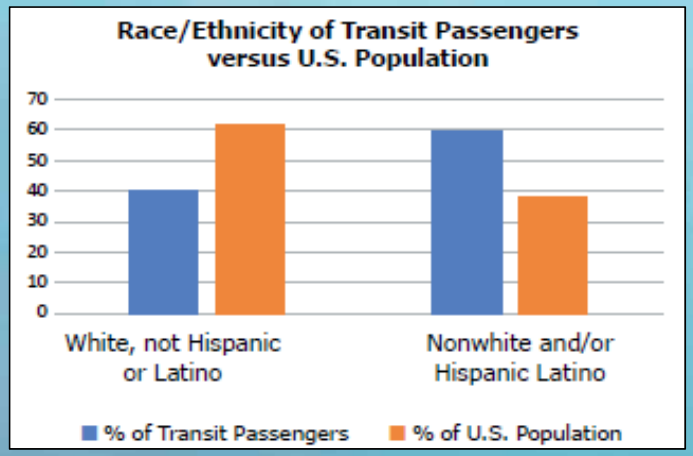
Major Focus of Discussion Panels

1. How can AV technology expand access to healthcare, employment, education, and recreation for ALL people?

2. How will AV impact the transportation ecosystem?

3. What are the potential benefits / costs of widespread AV deployment for cities and metropolitan regions?

Discussion Topics – Equity and Access



- AV <u>should</u> expand access for ALL users
- **Transportation Disadvantaged** – how do we ensure AV does not reinforce existing disparities?
- **Elderly** – 1 in 5 have "retired from driving"
- **Americans w/ Disabilities** – over 57 million
  - 6 million struggle to obtain transportation
- **Transportation Workers** – Need to be mindful of impact on jobs

Discussion Topics – Transportation Network

- Removing human error
- Shared ownership, shared use, and Mobility as a Service (MaaS) will improve mobility
- UBER/Lyft a sign of things to come?
  - ✚ Increased mobility & convenience
  - ✚ Cheaper than personal vehicle
  - ━ Reduced transit use
  - ━ Disruptive curbside pick-up/drop-off
  - ━ Net increase in VMT

- Will free "drive" time lead to increased urban sprawl?

Discussion Topics – Transportation Network

- Investments needed in **physical infrastructure** to support AV operation, sensors, and visioning

- Investments needed in **vehicle-to-infrastructure (V2I) communications** to support connected vehicle technology and data collection

- Could AV accelerate the shift to **electric vehicles**?
  - Cities and businesses will need to plan for charging stations

Discussion Topics – Land Use and the Built Environment

- **Right-of-Way** – reduced pavement widths will free up right-of-way for bike/ped and transit infrastructure

- **Zoning and Land Use**
  - Passenger pick-up / drop-off
  - Repair shops
  - Retail
  - Sprawl

- **Parking** – shared ownership and AV drop-offs may reduce parking need
  - What happens to existing parking inventory?

Discussion Topics – Comprehensive Plans and Related Plans

- **"Future Element" –** similar to *Transportation* or *Housing Element*
- **Technological Advancements** – Comprehensive Plans may require shorter update cycles
- **Small-Scale Subarea Plans** – Corridor, Neighborhood plans may support the development of pilot projects

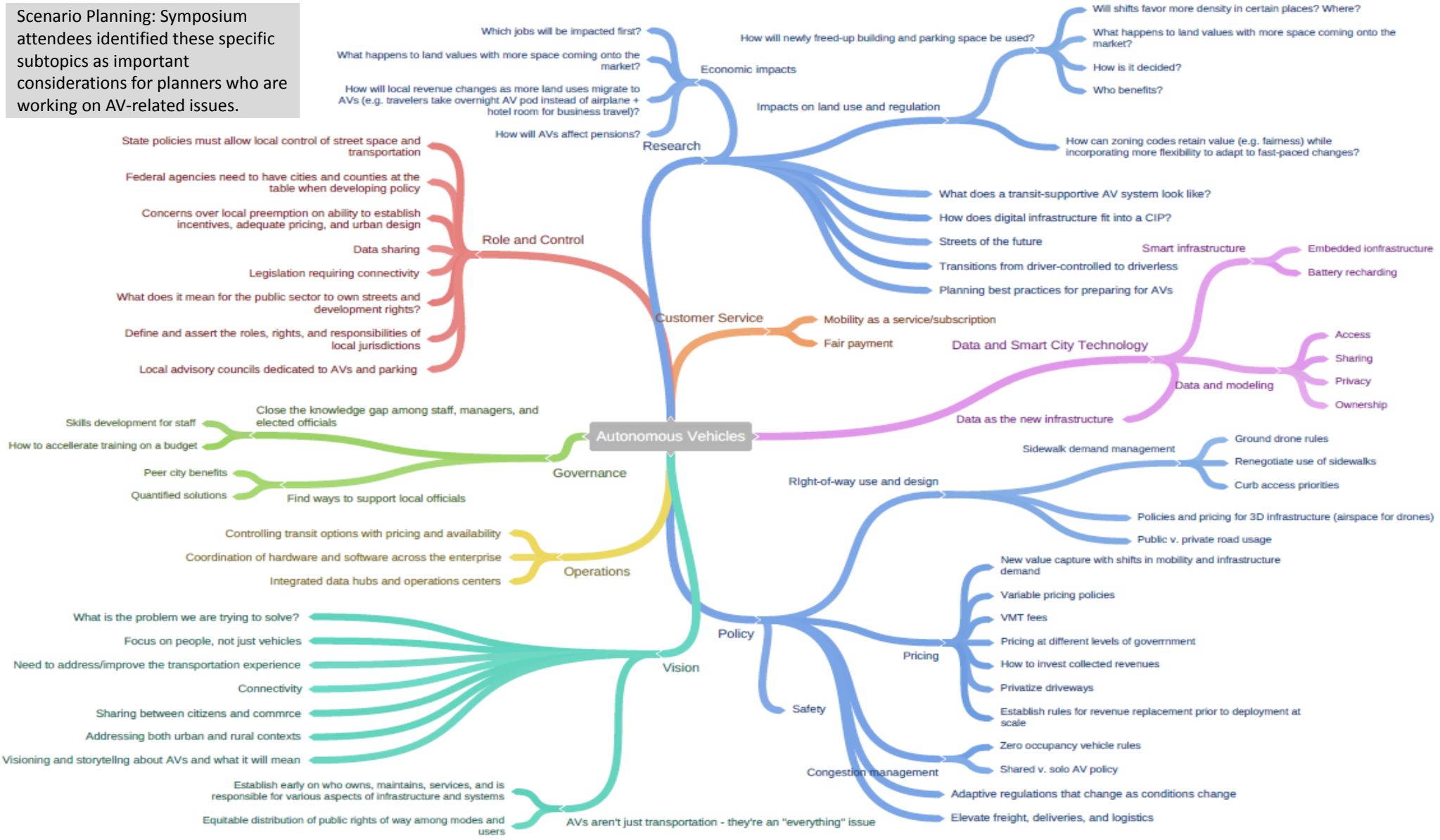
- **Scenario Planning** – will help practitioners and stakeholders understand AV impacts under various conditions

Discussion Topics – Comprehensive Plans and Related Plans

- **Health –** What are the positive AND negative effects of AV on health?
- **Growth Management** – How do we keep AVs from encouraging sprawl?
- **Environmental Impacts** – Sustainability Plans can encourage use of shared electric AVs to reduce GHG emissions

- **Green Infrastructure** – Plans can begin identifying potential park / open space locations to leverage lands that will need to be repurposed

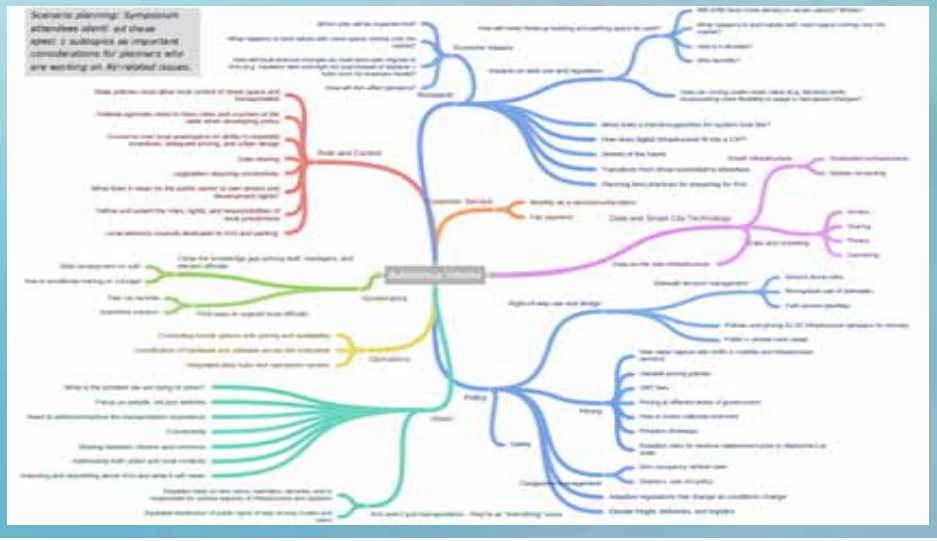
Scenario Planning: Symposium attendees identified these specific subtopics as important considerations for planners who are working on AV-related issues.



Scenario Planning Exercise

Key policy concerns include:

- Roles and responsibilities at each level of government
- Retrofitting existing infrastructure as AVs are deployed over time
- Strategies for revenue replacement prior to AV deployment at scale
- Freight, deliveries, and logistics
- Congestion management
- Sidewalk/curb demand management



How to Plan for Autonomous Vehicles

- The time to begin planning is now
- NOT Planning for AVs
  - Instead, how can AVs serve the community's vision and goals
- Must anticipate disruptive effects of technology
- Must account for uncertainty

Discussion Topics – Example Transportation Plans

- **Smart Mobility Roadmap 2017 –** Austin, Texas

  http://austintexas.gov/sites/default/files/files/Smart_Mobility_Roadmap_-_Final.pdf

- **Urban Mobility in a Digital Age** – Los Angeles DOT

  http://www.urbanmobilityla.com/strategy/

  https://static1.squarespace.com/static/57c864609f74567457be9b71/t/57c905f9bebafb1188fbdf3f/1472792111872/Transportation+Technology+Exec+Summary_2016.pdf

- **New Mobility Playbook** – Seattle DOT

  https://static1.squarespace.com/static/57c864609f74567457be9b71/t/57c905f9bebafb1188fbdf3f/1472792111872/Transportation+Technology+Exec+Summary_2016.pdf

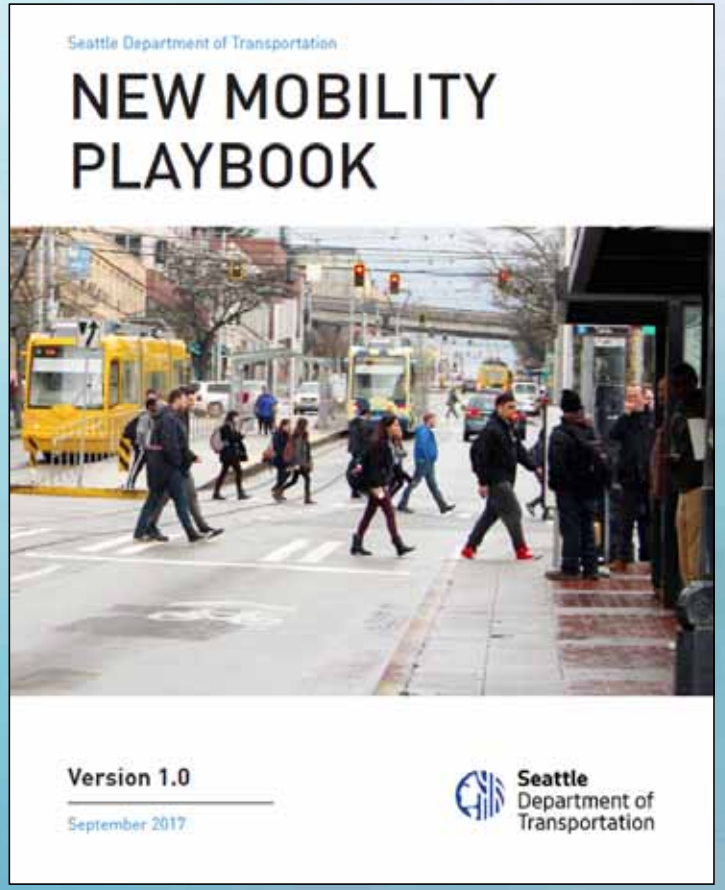


Table 2. Preliminary Automated Mobility Policy Framework, Seattle

Topic	Example Policy
Equity and Accessibility	**EA1:** Ensure the benefits of automated mobility are equitably distributed across all segments of the community and that the negative impacts of automated mobility are not disproportionately borne by traditionally marginalized communities.
Pilots and Partnerships	**PP1:** Develop strategic pilot partnerships to test automated vehicle technology in Seattle's climate, hilly terrain, and urban traffic conditions.
Infrastructure and Street Design	**IS1:** As vehicle ownership decreases and reliance on shared automated vehicle fleets increases: • Capitalize on system efficiencies to implement our transit, bicycle, and pedestrian master plans. • Capitalize on opportunities to invest in placemaking features and expand the pedestrian realm. • Identify and phase in corridors and zones dedicated to transit, walking, and high-occupancy automated vehicles only.
Mobility Economics	**ME1:** Develop a tiered and dynamic per-mile road use pricing mechanism for automated vehicles operating in highly congested areas and corridors of Seattle: • Tier 1 (elevated surcharge): Zero-occupant automated vehicles • Tier 2 (base surcharge): Single-occupant automated vehicles • Tier 3 (reduced surcharge): Automated vehicles using smart lanes with less than three passengers • Tier 4 (no surcharge): Automated vehicles using smart lanes with three or more passengers • Tier 5 (additional surcharge on Tiers 1–3): Peak travel period surcharge for all nonpublic transit vehicles trips with less than three passengers, including freight
Land Use and Building Design	**LB1:** Ensure automated vehicles advance our land-use goals and capture the value of transit-oriented development.

Public Investments

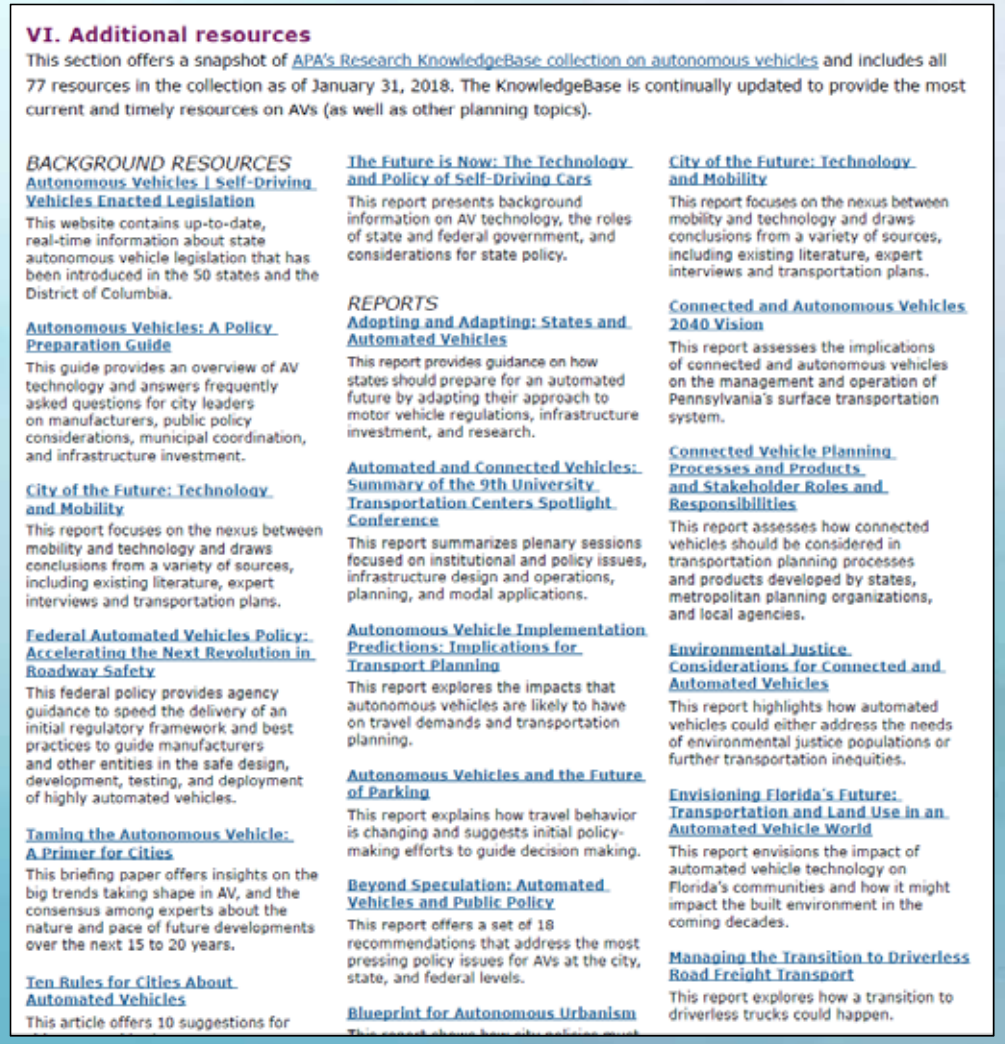
- Shifting investment needs in **physical** and **communications** infrastructure
  - O&M costs will increase
  - Capital costs may decrease
- Declining Revenues
  - Federal and State gas tax revenues have been declining for years
  - Parking revenue may decline with reduced parking needs
  - Fewer dealerships and smaller retail spaces; less sales tax revenue
- Alternative Revenue streams?
  - Per mile VMT fee administered by USDOT to fund a new federal grant program focused on AV safety and reliability
  - Local pricing strategies on parking, curbside use, and commuter traffic
  - PPPs with MaaS companies
- CIP / TIP will need to adapt to changing investment environment
  - “Fix-it-first” policy prioritizing maintenance over roadway construction projects

Future Research Needs

- Most current research on impacts of AV assumes **full AV deployment**
- Need stronger **scenario planning tools** considering AV uncertainties
- Better AV guidance for Comp Plan language, design standards, PPPs, etc.
- AV impacts on suburban / rural areas?

Questions?

https://www.planning.org/research/av/



VI. Additional resources

This section offers a snapshot of APA's Research KnowledgeBase collection on autonomous vehicles and includes all 77 resources in the collection as of January 31, 2018. The KnowledgeBase is continually updated to provide the most current and timely resources on AVs (as well as other planning topics).

BACKGROUND RESOURCES

Autonomous Vehicles | Self-Driving Vehicles Enacted Legislation

This website contains up-to-date, real-time information about state autonomous vehicle legislation that has been introduced in the 50 states and the District of Columbia.

Autonomous Vehicles: A Policy Preparation Guide

This guide provides an overview of AV technology and answers frequently asked questions for city leaders on manufacturers, public policy considerations, municipal coordination, and infrastructure investment.

City of the Future: Technology and Mobility

This report focuses on the nexus between mobility and technology and draws conclusions from a variety of sources, including existing literature, expert interviews and transportation plans.

Federal Automated Vehicles Policy: Accelerating the Next Revolution in Roadway Safety

This federal policy provides agency guidance to speed the delivery of an initial regulatory framework and best practices to guide manufacturers and other entities in the safe design, development, testing, and deployment of highly automated vehicles.

Taming the Autonomous Vehicle: A Primer for Cities

This briefing paper offers insights on the big trends taking shape in AV, and the consensus among experts about the nature and pace of future developments over the next 15 to 20 years.

Ten Rules for Cities About Automated Vehicles

This article offers 10 suggestions for

The Future is Now: The Technology and Policy of Self-Driving Cars

This report presents background information on AV technology, the roles of state and federal government, and considerations for state policy.

REPORTS

Adopting and Adapting: States and Automated Vehicles

This report provides guidance on how states should prepare for an automated future by adapting their approach to motor vehicle regulations, infrastructure investment, and research.

Automated and Connected Vehicles: Summary of the 9th University Transportation Centers Spotlight Conference

This report summarizes plenary sessions focused on institutional and policy issues, infrastructure design and operations, planning, and modal applications.

Autonomous Vehicle Implementation Predictions: Implications for Transport Planning

This report explores the impacts that autonomous vehicles are likely to have on travel demands and transportation planning.

Autonomous Vehicles and the Future of Parking

This report explains how travel behavior is changing and suggests initial policy-making efforts to guide decision making.

Beyond Speculation: Automated Vehicles and Public Policy

This report offers a set of 18 recommendations that address the most pressing policy issues for AVs at the city, state, and federal levels.

Blueprint for Autonomous Urbanism

City of the Future: Technology and Mobility

This report focuses on the nexus between mobility and technology and draws conclusions from a variety of sources, including existing literature, expert interviews and transportation plans.

Connected and Autonomous Vehicles 2040 Vision

This report assesses the implications of connected and autonomous vehicles on the management and operation of Pennsylvania's surface transportation system.

Connected Vehicle Planning Processes and Products and Stakeholder Roles and Responsibilities

This report assesses how connected vehicles should be considered in transportation planning processes and products developed by states, metropolitan planning organizations, and local agencies.

Environmental Justice Considerations for Connected and Automated Vehicles

This report highlights how automated vehicles could either address the needs of environmental justice populations or further transportation inequities.

Envisioning Florida's Future: Transportation and Land Use in an Automated Vehicle World

This report envisions the impact of automated vehicle technology on Florida's communities and how it might impact the built environment in the coming decades.

Managing the Transition to Driverless Road Freight Transport

This report explores how a transition to driverless trucks could happen.

Current Initiatives

Jeremy Dilmore, District Five TSM&O

CITY OF Marietta GEORGIA

Connected Vehicle Preemption

Powered by Applied Information Glance TravelSafely App

GLANCE TRAVELSAFELY

Transportation Management Center

FDOT TSM&O
Transportation Systems Management & Operations

Transportation Systems Management & Operations

CENTRAL FLORIDA TSM&O CONSORTIUM

THANK YOU!

Next Consortium – May 31, 2018

TSM&O Consortium Meeting

MEETING AGENDA

D5 Urban Office
133 S. Semoran Blvd.
Orlando, FL 32807
Lake Apopka B Conference Room

April 5, 2018; 10:00 AM-12:00 PM

1) WELCOME
2) FDOT D5 10-YEAR TSM&O REQUEST LIST (CFMPOA PRESENTATION – UPDATE)
   - David Williams, VHB
3) TSM&O STRATEGY GUIDE – UPDATE
   - David Williams, VHB
4) SIGNAL TECHNICIAN PROGRAM AT ORANGE TECHNICAL COLLEGE – UPDATE
   - David Williams, VHB
5) TRANSFUTURE – PROBABILISTIC SCENARIO PLANNING TOOL
   - John Zielinski, District Five PLEMO
   - Santanu Roy, HDR
6) AUTOMATED VEHICLES AND LOCAL/REGIONAL PLANNING
   - Amy Sirmans, District Five PLEMO
7) CURRENT INITIATIVES
   - Jeremy Dilmore, District Five TSM&O