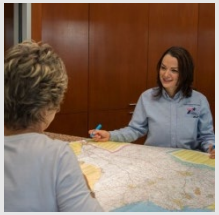
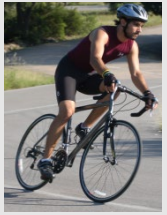
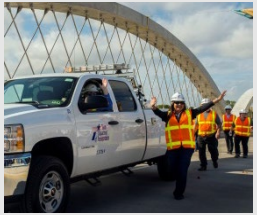


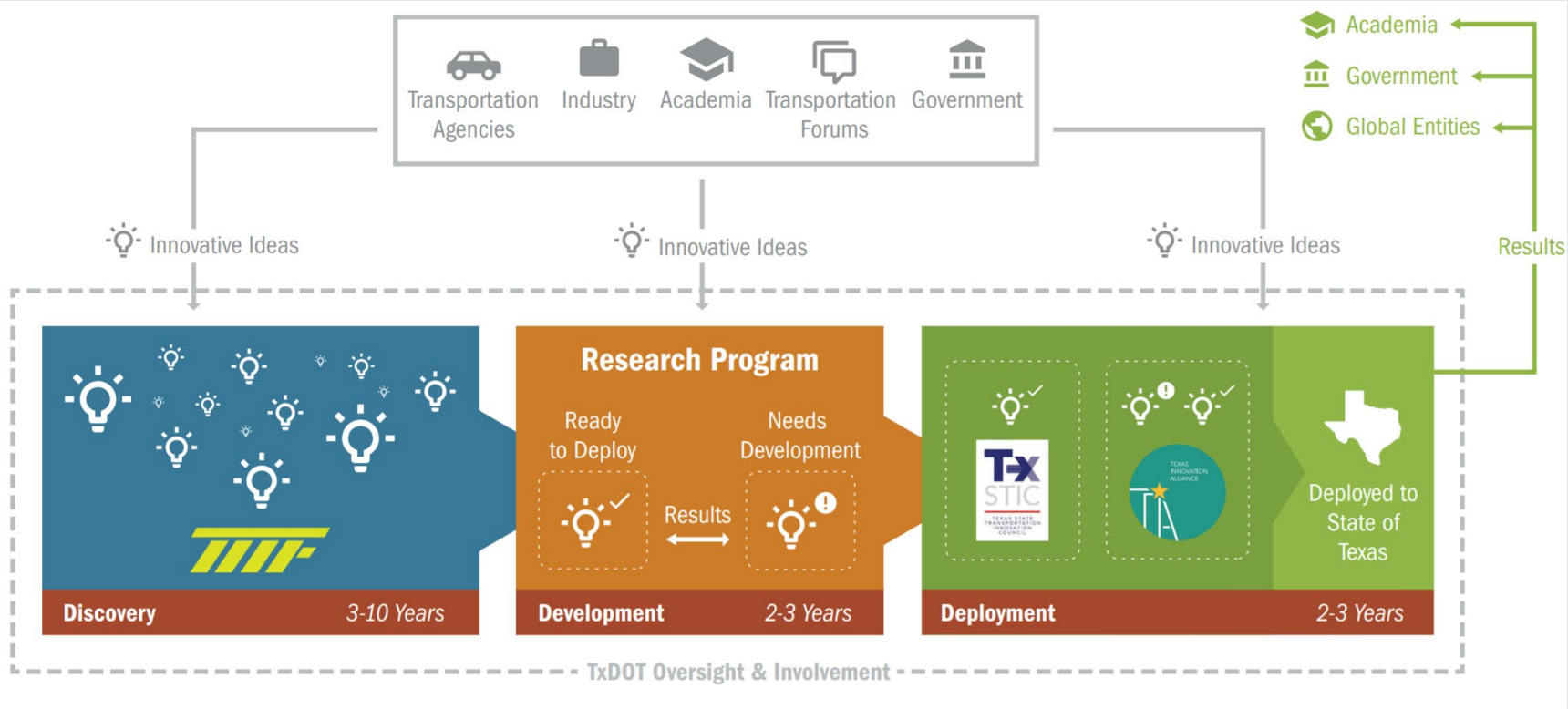



CAV & TECHNOLOGY EFFORTS

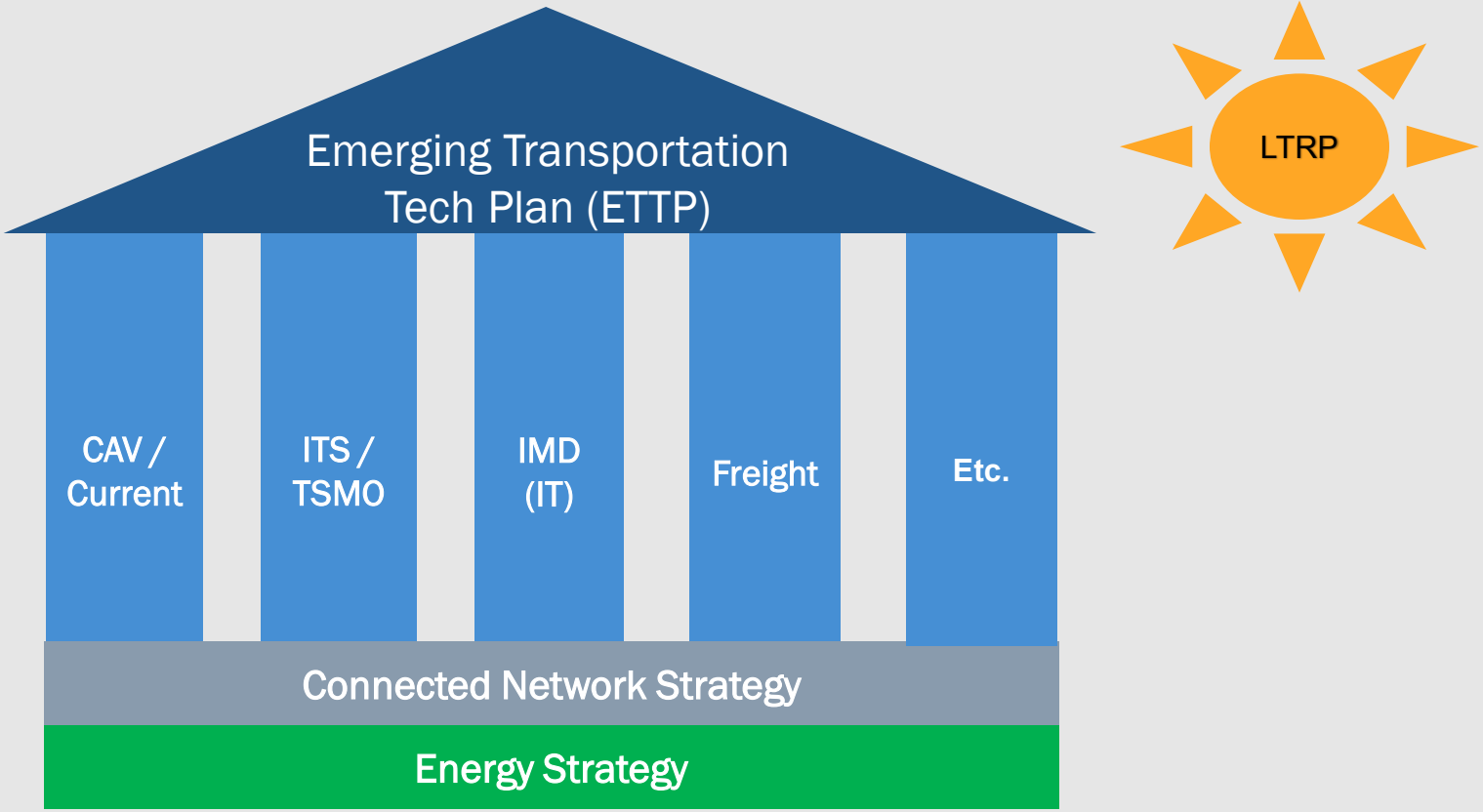
Texas Department of Transportation

April 29, 2019

TxDOT Innovation Program



Tech-Related Strategies



TxDOT internal tech efforts

Operations

High Precision Survey

OnDemand Geospatial

Georeferenced Assets

Intelligent Construction / AMG

Integration

Connected Autonmous Vehicles
Drones / UAS

Smart City / ITS
IoT / Edge Computing

Multi-Modal

Business

Automation
AI / RPA

Realtime Analytics

Intelligence & Insight

GRC & Open Data

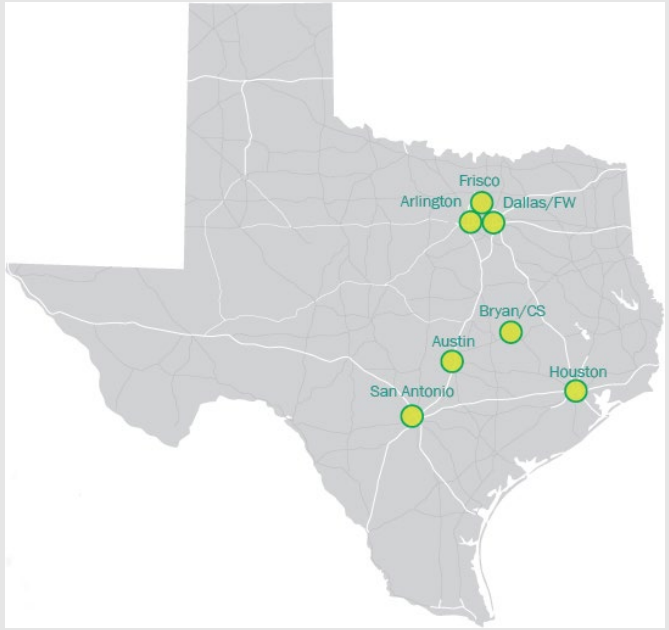
CAV working group and task force

- CAV information and development: educate, collaborate, coordinate, integrate
  - CAV Working Group: Focus on internal TxDOT activities/strategies/resources
  - CAV Task Force: Focus on state/county/local governments, MPOs, RMAs, toll authorities, industry and academia.
- Both with ties to federal and national activities

ATCMTD

- Advanced Transportation and Congestion Management Technologies Deployment Program
- Houston 2016: ConnectSmart – Connecting Transportation System Management & Operations (TSM&O) and Active Demand Management (ADM)
- TxDOT 2017: Texas Connected Freight Corridors
- I-10 Coalition 2018: Interstate 10 Truck Parking Availability System (TPAS)

Innovative Transportation Projects



https://www.txdot.gov/inside-txdot/division/planning/innovative-projects.html

Texas Innovation Alliance and Smart Cities Lab

SMART Cities LAB
www.smartcitieslab.org

TEXAS
INNOVATION
ALLIANCE

ARLINGTON | AUSTIN | BRYAN / COLLEGE STATION | CORPUS CHRISTI | COLUMBUS | DALLAS
DENVER | DETROIT | EL PASO | FRISCO | FT WORTH | HOUSTON | KANSAS CITY | OMAHA
PITTSBURGH | PORTLAND | SAN ANTONIO | SAN FRANCISCO | SEATTLE | SOUTH BEND

Texas Innovation Alliance and Smart Cities Lab Cross Cutting Initiatives

TEXAS PROVING GROUNDS

DATA CHALLENGE & OPEN DATA

COMMUNICATIONS & COMMUNITY ENGAGEMENT

FUNDING, POLICY, & PROCUREMENT

COOPERATIVE RESEARCH AGENDA

Texas Innovation Alliance and Smart Cities Lab Communities of Practice

Equity & Access

Tackle the challenge of providing affordable and reliable mobility service to enable the elderly and disabled to access healthcare services.

Seamless Mobility

Unlock the 1st/last mile and develop a multimodal payment platform that enables travelers to tap into a marketplace of mobility options.

Energy & Sustainability

Forge strategies for installing charging infrastructure, incentivizing fleet electrification, and shifting mode share.

Real-Time Data

Develop a standard for construction/lane closures/ incidents and prioritize readiness investments for CAV infrastructure.

Freight & Logistics

Improve goods movement by enabling truck platooning, supporting port operations, and securely exchanging public-private data.

MONTHLY DEEP-DIVES

Automated Vehicles for Aging & Disability Populations

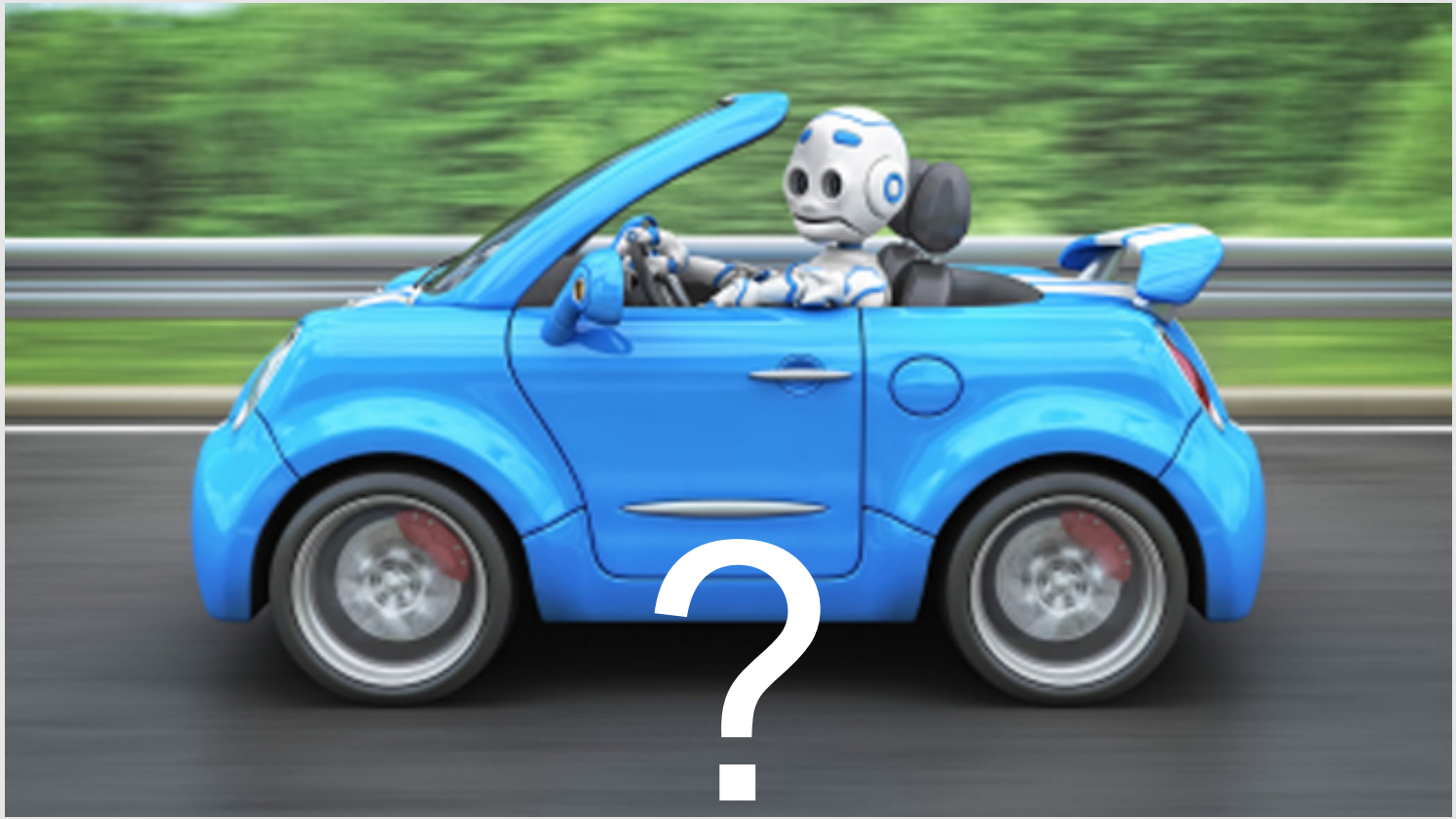
Dockless Mobility

Single Payment Platform

Mobility Data Lakes

Thoughts

- Challenges
  - Needs: safety, quality of life, congestion…or what do people say?
  - Focus, value, impact
  - Costs
  - Transition
  - Seeing the future
- Opportunities
  - Rural and Urban
  - P3s
  - Multi system: health, telecoms, emergency services, food, apparel, etc.
  - Freight
  - Early passenger / delivery solutions
- Priorities
  - People, needs
  - Safety and Quality of Life
  - The basics: striping and pavement
  - What's your press release in 5 years
  - Education
  - Data and infrastructure
  - Transitional focused deployments, with partners
  - Serve the whole state
  - Sharing



National technology efforts

- AASHTO Committee on Transportation System Operation (CTSO)
  - Cooperative and Automated Transportation (CAT) Coalition
  - AASHTO Connected & Automated Vehicle Working Group
  - Soon to be formed Task Force on Highway Automation (develop a National Strategy on Highway Automation, through forming a Pooled-fund study to do this (led by Tennessee DOT)) (vision, business case, goals, benefits, ROI, legislative strategy, etc.)
- State Automated Vehicle Task Forces Community of Practice
- Multi-state Coalition on Highway Automation Readiness (MCHAR)
- FHWA National Dialog on Highway Automation
- ITS America and TRB committees

National Technology efforts

- Connected Vehicle Pooled Fund Study
- NCHRP Projects
- Cooperative Automation Research Mobility Applications (CARMA)
  - An open source software platform initiated by FHWA to enable the testing and evaluation of cooperative automation concepts for improving safety and increasing infrastructure efficiency.
  - Vision of cooperative automation as an extension of TSMO
- National Operations Center of Excellence (NOCoE)
- Comments to FHWA and NHTSA
- Congressional Testimony

Common ideas for a CAV working group

- CAV opportunities, challenges, and guidance
- Guidance on transportation technology and infrastructure
- CAV Strategic Plan, CAV business plan, tied into Technology, Research, Freight, ITS and TSMO plans…as well as LTRP and UTP
- CAV Planning encompasses many things:
  - national planning (interoperability & architecture)
  - strategic program planning
  - business & organizational planning
  - transportation system planning
  - communications & outreach planning
- Make the case for technology installations that will benefit human drivers now
  - Asset management, even understanding and digitizing what is currently on-system is a great first step
  - Lane striping changes and frequency of updates
  - Standards for Hardware and Software
  - Cybersecurity
- Design build
- DSRC vs C-V2X
- Benchmark to other DOTs

Common ideas for a Statewide CAV TF and National COP

- CAV opportunities, challenges, and guidance
- Guiding policy frameworks that Enable or Regulate for CAV Testing and Operations
- Statewide CAV strategic planning and policy
- Resourcing & organizational alignment
- Advise local governments on CAV technology, local planning, collaboration with local governments – knowledge and laws primacy
- Strategic partnership opportunities for testing, pilots and deployment of CAV
- Guidance on preparing for CV Data and information, and ownership
- AV Testing, voluntary certification
- Operation and safety of CAVs / Impacts on public safety and perception
- Privacy & Cyber Security
- Multi-modal applications and seams
- Technical Details / Operating Design Domains
- Insurance and Financial Responsibility
- Law Enforcement Interaction
- Education and Public Engagement
- Workforce Impacts and Agency Staffing
- Crash and Incident Reporting Requirements
- Lessons learned and successes
- Testing experiences & feedback from manufacturers/OEMs on infrastructure needs
- Standardizing and Harmonizing State Regulations: Vehicle Code, Enforcement and Compliance
- Multistate corridors
- Cross border/jurisdictional interoperability
- Peer network development & support, best practice synthesis, research needs & projects (supplement NCHRP & FHWA), research products/tools/guidance implementation & training