MARYLAND CONNECTED & AUTOMATED VEHICLE WORKING GROUP

April 21, 2020
Virtual Meeting

…While You Wait…

1. Please type your name & organization into the CHAT box
2. Please remain on mute

AGENDA

1:00 pm	Introductions & Opening Items
1:20	CAV Shared Mobility
1:40	FCC Proposed Rulemaking
1:45	Panel Discussion: Preparing the Workforce for an AV Future
3:00 pm	Adjourn

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION
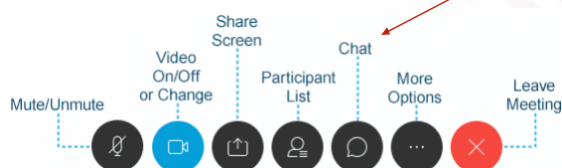
VIRTUAL MEETING

Approach for Today
- Moderated virtual meeting
- Opportunities for interaction

Ground Rules
- Please remain on mute unless you are asked to speak
- Consider the group size and diversity when posing questions

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INTERACTIVE TOOLS

Use CHAT to ask a question or provide a comment

Share Screen
Video On/Off or Change
Participant List
Chat
More Options
Leave Meeting
Mute/Unmute

Open the PARTICIPANT list, and next to your name you can raise/lower your hand to request the moderator unmute you

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POLL: ATTENDANCE

Is this your first Maryland CAV
Working Group meeting?

Vote now!

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WORKING GROUP LEADERSHIP

MDOT CAV Working Group Updates

Chrissy Nizer
Administrator
MDOT MVA

Jim Ports
Executive Director
MDTA

MDOT CAV web landing page – www.mdot.maryland.gov/MarylandCAV

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

CAV SHARED MOBILITY

- Administrator Kevin Quinn, MDOT MTA

MARYLAND DEPARTMENT OF TRANSPORTATION

MDOT MTA OVERVIEW

- Six modes
- ~100 million rides a year
- 13th largest transit system in US
- Oversees $140 million in funding and technical assistance to Locally Operated Transit Systems (LOTS)
- Operating budget of ~$850 million per year
- Six-year capital budget of ~$3.3 billion

MARYLAND DEPARTMENT OF TRANSPORTATION

MDOT MTA CAV WORKING GROUP

- Created in Summer of 2017
- Comprised of Bus Operations, Maintenance, Safety, Labor Relations, Planning, Performance Management, Government Affairs, Transit Police and Innovation personnel
- Three active CAV projects since inception
- Recently completed a Shared Mobility Plan that includes high-level CAV Policy and Planning

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MARC DORSEY AVP PILOT

- Overview – Automated Valet Parking (AVP) & recall pilot project at MARC Dorsey station to test capacity savings and commuter benefits of AVs
- Project Partner – STEER Tech located in Annapolis Junction, MD
- Phase I - Closed-course testing (completed in Nov 2019)
- Phase II - Mixed-traffic testing in non-peak and peak commuting hours – testing paused due to COVID-19
- Budget: $224,850
- Timeline: 12-13 months
- First Highly Automated Vehicle (HAV) grant in the TRB Ideas Deserving Innovation (IDEA) Transit program
- First Federally-funded HAV project in Maryland

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HOW IT WORKS

1) Send the car

Passengers exists vehicle and engages STEER app to command car to park itself

2) AV Launches

Upon exiting vehicle, car will drive itself into a designated parking spot

3) Summon Car

When ready to depart, car is summoned through the STEER app for passenger pick up

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POTENTIAL BENEFITS

- MARC commuter lots are over capacity (Halethorpe example)
- Commuters sometimes have to walk over a mile to the platform
- Technology has the ability to save 25-28% in capacity due to not closing, opening doors
- App allows passenger to drive up to the curb, step out of the vehicle, and send the car to park autonomously
  - Saving time, increase reliability, and potentially increase ridership long-term

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TRADEPOINT ATLANTIC CAV PILOT

- Collaborative partnership between Univ. of Maryland, Local Motors, MDOT, and Tradepoint Atlantic

- UMD received seed funding for six-month deployment of "Olli" automated shuttle

- Will serve as first/last mile provider for MDOT MTA Route 63 passengers at Tradepoint Atlantic

- Multiple Olli shuttles will be deployed to deliver full-day operations, seven days a week

- UMD and Local Motors will promote deployment and engage leadership in Operational Kickoff as well as a "Student Day"

- Project is paused due to COVID-19
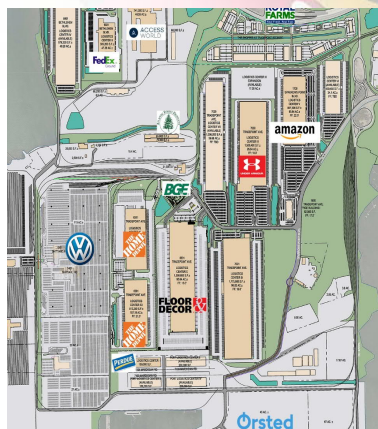
MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

TRADEPOINT CAV PILOT GOALS

MDOT	UMD	Local Motors	Tradepoint
Exposure to AV first/last mile	Technical analysis	Exposure to transit operations	Increased mobility options
Workforce education	Student research opportunities	Marketing opportunities	Exposure to AV shuttle operations
Enhanced passenger experience	Exposure to in-service transit operations		Improved tenant experience

Pre-trip   Transit Journey   First/last Mile   Destination

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TRANSIT WORKFORCE

- MDOT MTA operators are here to stay
- Proactive discussions with union leadership
- Focus on education, awareness, and exposure to CAV pilot projects
- MDOT MTA currently planning a transition to zero emission bus fleet that demands new labor requirements
  - Maintenance staff must be trained to work with high voltage
  - Triggers the creation of new jobs descriptions
  - Blueprint of potential new CAV-specific roles

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QUESTIONS?

FCC NPRM ON 5.9 GHZ

- Propose Rulemaking to reallocate more than half the spectrum for non-transportation purposes
- Widespread objections from automakers, infrastructure owners/operators, safety experts, and other stakeholders
- Comments closed 3/9, reply-comments close 4/27
- Uncertain when FCC will act
- Safety-oriented V2X apps may not evolve, existing projects may require updating
- US DOT has proposed "negotiated rulemaking"
- https://www.transportation.gov/content/safety-band

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FUTURE WORKFORCE PANEL

Panelists
- Mark Wilson, PhD, Professor, Urban & Regional Planning and Program Director, Michigan State University
- Brandon Butler, Esq, County Administrator, Allegany County
- Elaina Farnsworth, Chief Executive Officer, The Next Education

Moderator
- Severin Skolrud, WSP/MDOT MTA

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The AV Workforce

Mark Wilson PhD
School of Planning, Design and Construction
Michigan State University

Urban and Regional Planning
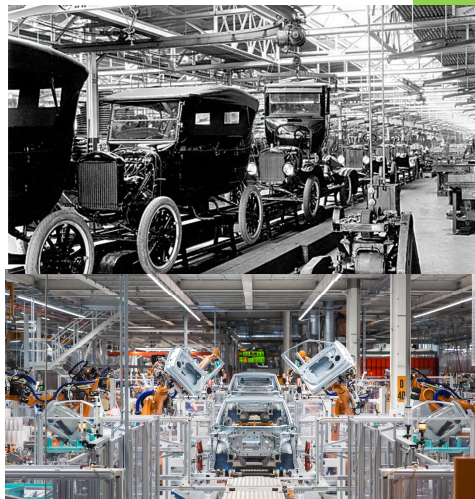**MICHIGAN STATE UNIVERSITY**

Disruptive Technologies

- Workforce implications of disruptive technologies
- New ways of production may use different labor skills and materials
  - For AVs a shift towards electric power, software, communications
  - Occupations associated with conventional vehicle production decline, increase for advanced manufacturing and software occupations

MSU – College of Engineering

Workforce Changes

- Operations use different inputs
  - When materials change, so does production
  - Reduced demand for drivers, new maintenance skills needed
- Related industries affected
  - For AVs, impact of shift to fleet sales vs individual ownership via dealers
  - Fleet maintenance vs dealers, mechanics

Workforce Changes

- Indirect social implications
  - If AVs change how and where people work and shop, then change in demand for labor

Workforce Changes

- Research at Michigan State University
- Implications for land use (Planning, Design & Construction)
  - Public willingness at adopt and change
  - Redevelopment of auto infrastructure (parking lot development, garage rehab)
- Safety sharing road with an AV
  - 31% would feel safe as a pedestrian; 18% feel safe as a cyclist; 34% safe driving a vehicle
- Workforce change (Shelia Cotton)
  - Changes in driving jobs

MSU AV WORKFORCE – Q&A

- Technology creating demand for new labor skill sets
- Implications for fleet maintenance
- Societal benefits and challenges
- Land use impacts

Mark Wilson PhD wilsonmm@msu.edu

School of Planning, Design and Construction
Michigan State University

www.autonomousfutures.org

AUTONOMOUS
FUTURES

MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

**Workforce Training &
 Maryland Advanced Technology Center**

Brandon Butler, County Administrator, Allegany County, Maryland
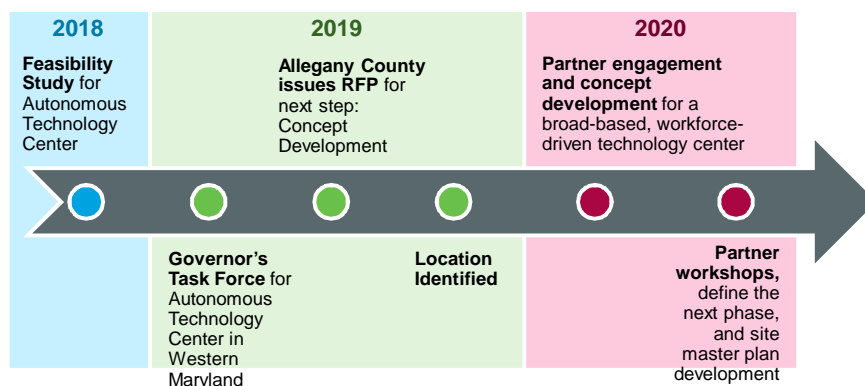
ICF

Mannik Smith GROUP

Taiber Ventures

Talent-based development builds communities…

*Both in an emerging industry &
A community with a rich history in transportation
looking for a technology-focused future*

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Evolution of ATC

2018	2019	2020
Feasibility Study for Autonomous Technology Center	**Allegany County issues RFP** for next step: Concept Development	**Partner engagement and concept development** for a broad-based, workforce-driven technology center

| | **Governor's Task Force** for Autonomous Technology Center in Western Maryland | **Location Identified** | | **Partner workshops,** define the next phase, and site master plan development |

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Maryland Advanced Technology Center (ATC)

- **Phased, scalable center** to meet immediate partner needs for **workforce development, testing and education**
- Located on a parcel of land **between I-68 and the Frostburg** State University (FSU) campus
- Support **training, testing and workforce-related activities** for:
  - Mobility technology (connected and automated vehicles)
  - Cybersecurity
  - Transportation management and operations
  - Emergency management
  - K-12 STEM education

ATC Vision

Prepare Maryland and the nation's workforce & infrastructure for the future of technology with a focus on transportation, cybersecurity and automation.

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ATC Mission

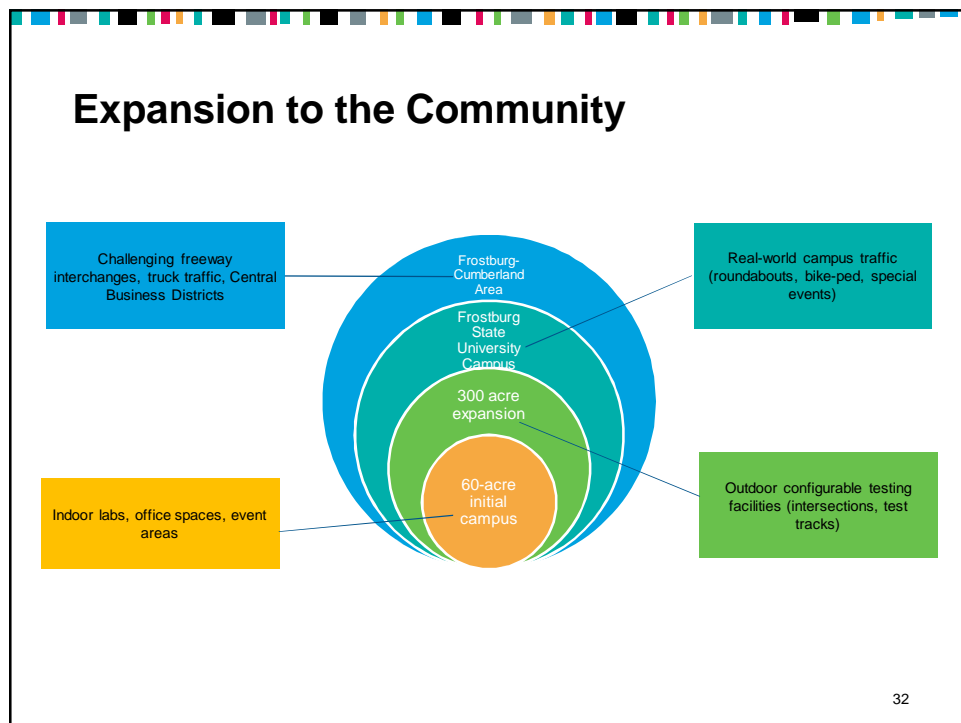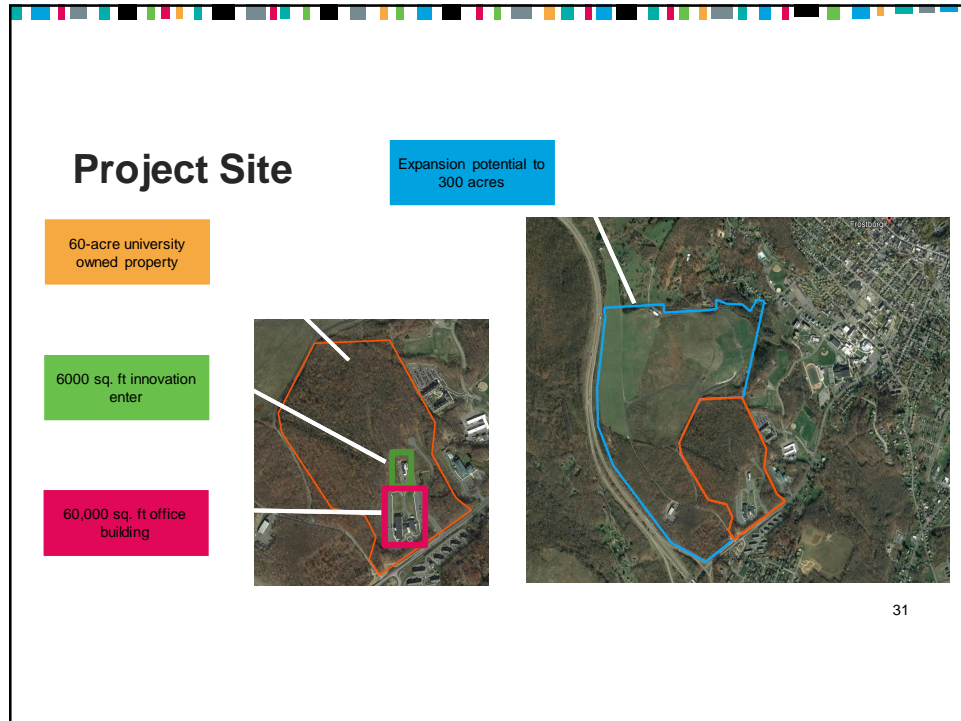| Support region, state and national readiness for emerging technology integration			
Serving as a regional training and testing center for public agencies and industry to use to advance the state of the practice for the operation and maintenance of emerging technologies.	Bolstering existing academic programs at local universities, colleges, and technical centers.	Partnering with local school districts to generate exposure to STEM learning and career opportunities for K-12 students.	Establishing private sector partnerships to support readiness testing, validation and verification of emerging technology

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Project Site

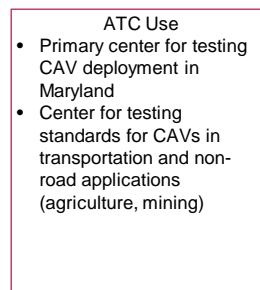60-acre university owned property

6000 sq. ft innovation enter

60,000 sq. ft office building

Expansion potential to 300 acres

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Expansion to the Community

Challenging freeway interchanges, truck traffic, Central Business Districts

Frostburg-Cumberland Area

Frostburg State University Campus

300 acre expansion

60-acre initial campus

Real-world campus traffic (roundabouts, bike-ped, special events)

Indoor labs, office spaces, event areas

Outdoor configurable testing facilities (intersections, test tracks)

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Focus Areas and Markets

	Emerging Mobility	Transportation Infrastructure	Information Technology	K-12 STEM Education
Workforce Development and Training	✔	✔	✔	✔
Testing, Validation, & Verification	✔	✔		

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Emerging Mobility Technology

Work in progress

- **Connected and Automated Vehicle applications testing**
- **Standards testing, Vehicle-Infrastructure Integration Testing**
- **CAV, EV workforce training**

Potential Partners	Needs	ATC Use
MDOT MARYLAND DEPARTMENT OF TRANSPORTATION. / UL / local motors / Cox AUTOMOTIVE / MARYLAND TRANSPORTATION INSTITUTE	• Lab space and indoor testing space • Modular test environments and outdoor testing space • Vehicle assembly, disassembly, reassembly, and storage space • V2X technology and communications capabilities • Electric vehicle and battery charging capabilities • IT and simulation capabilities	• Primary center for testing CAV deployment in Maryland • Center for testing standards for CAVs in transportation and non-road applications (agriculture, mining)

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Transportation Infrastructure

Work in progress

- **Transportation Systems Management and Operations training, R&D, field testing**
- **Incident Management training and preparedness**
- **Technical assistance programs for State and local DOTs**

Potential Partners	Needs	ATC Use
MDOT — MARYLAND DEPARTMENT OF TRANSPORTATION; MARYLAND TRANSPORTATION INSTITUTE	• Modular test environments and outdoor testing spaces • Highway and arterial environments • ITS infrastructure (signals, signs, control rooms) • Vehicle assembly, disassembly, reassembly, and storage space • V2X technology and communications capabilities • IT and simulation capabilities	• Primary center for testing TSMO training, development in Maryland

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Information Technology

- **Labor/workforce development pipeline through apprenticeships, training, employment for IT-related fields including cybersecurity & data analytics**
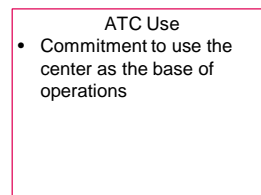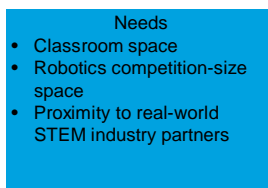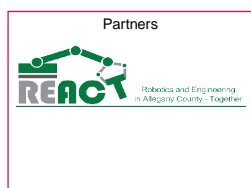
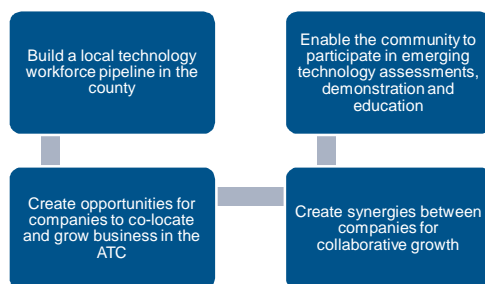| Partners	Needs	ATC Use
IBM; DTI; FROSTBURG STATE UNIVERSITY; ICF	• Classroom space • Event and Networking Space	• Commitment to use the center as needed (IBM) • Commitment to set up workforce training programs and have staff in ATC (Delmock) • Cybersecurity Apprenticeship Program (ICF) • Curriculum, workforce, instructors (Frostburg)

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K-12 STEM Education

- **Early exposure for elementary, middle, and high school students for workforce development and entry to higher education for STEM**

Partners	Needs	ATC Use
REACT — Robotics and Engineering in Allegany County - Together	• Classroom space • Robotics competition-size space • Proximity to real-world STEM industry partners	• Commitment to use the center as the base of operations

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ATC as a Catalyst for the Community

Talent-based development builds communities

- Build a local technology workforce pipeline in the county
- Enable the community to participate in emerging technology assessments, demonstration and education
- Create opportunities for companies to co-locate and grow business in the ATC
- Create synergies between companies for collaborative growth

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ATC Phasing

2020-2021	2021-2024	2024-2027
Start-up	**Expansion**	**Build-Out**
▪ ATC Center established with office location	▪ Capital funds secured	▪ Test track, driving environments, roadside infrastructure built out per partner needs
▪ Early grants for center for planning and workforce training place	▪ Design, construction and build out of partner facilities begins	
▪ IT training/workforce partners moved in	▪ Site development underway	
▪ Site master planning & funding	▪ IT, K-12 Robotics fully utilizing the center	
▪ Marketing, branding, partner engagement	▪ MDOT and other partners starting to move	
▪ P3 partnership, business model finalization		
▪ Identification of policy requirements		

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MD ADVANCED TECH CENTER – Q&A

- Community-based workforce development training to develop sustainable economic growth
- Focus areas:
  - Emerging mobility
  - Transportation
  - IT
  - K-12 STEM Education
- Private and public partnerships to create joint commitment

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

Preparing the Workforce
for a CAV Future

Elaina Farnsworth, CEO

April 21, 2020

THE NEXT EDUCATION

Who We Are

The NEXT Education is all about Insights for What's Next.

The **Smart Cities** and **Communities of the Future** will be built upon critical knowledge and deep problem-solving skills mixed with:

- a **passion** for creating
- a **belief** in an equitable and sustainable transportation system and infrastructure
- a **shared goal** of a better – and safer – connected technology ecosystem for all.

THE NEXT EDUCATION

Connectivity By The Numbers

What consumers worldwide think, what employers are anticipating

13%
CONSUMERS WHO DO NOT CONSIDER A NEW VEHICLE W/O INTERNET ACCESS

21%
CONSUMERS WHO WOULD PAY FOR SUBSCRIPTION-BASED CONNECTIVITY SERVICES

35%
CONSUMERS WHO WOULD SPEND AN ADDITIONAL $100 FOR SMARTPHONE INTEGRATION

SOURCE: MCKINSEY

THE NEXT EDUCATION

Who We Help

We build, guide and equip industry agents of change.

TECHNICIAN

ENGINEER

LEADERS & PLANNERS

THE NEXT EDUCATION

What We Offer

The NEXT Education's platforms provide the knowledge and **power to innovate** and **advance** the intelligent transportation and new mobility industry. Here's what's available:

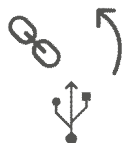|			
EMERGENCY PREPAREDNESS	CONNECTED VEHICLE PROFESSIONAL	INSTALLER & TECHNICIAN CERTIFICATION	AV FUNDAMENTALS
INSTALLER & TECHNICIAN	ITS & NEW MOBILITY COMMUNICATIONS	SMART CITY/INTERMODAL DEPLOYMENT	ITS & NEW MOBILITY POLICY

THE NEXT EDUCATION

WIIFM?

We've helped thousands of technical workers advance their skills and, in the course of that, **forge the world's 5G networks**, **intelligent systems**, and more.

- **Connect** with experts
- **Pace** your learning with tested, interactive lessons mixed with personal instruction
- **Plug** into resources and industry networks

THE NEXT EDUCATION

GROW THE PERSON,
GROW THE INDUSTRY.

THE

NEXT
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NEXT EDUCATION – Q&A

- Technology is quickly changing landscape and product demand
- New programs are needed to provide the necessary skill sets for America's workforce to evolve with the changing times
- Technical education accompanied by trusted certification programs can help elevate next-gen workforce

Elaina Farnsworth, CEO

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The Next Education
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Pontiac, MI

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MDOT MARYLAND DEPARTMENT OF TRANSPORTATION

AV WORKFORCE PANEL –

REMAINING QUESTIONS?

ADJOURN

- Next Meeting: August 11, 2020

- MDOT CAV web landing page –
  www.mdot.maryland.gov/MarylandCAV

- Please give us your feedback! Email Nanette Schieke -
  nschieke@mdot.maryland.gov

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