

CHANGEIS INSIGHTS



Andy Lehrer

Dr. Andy Lehrer holds a Ph.D. in Psychology with a focus on stress resilience, human performance, and neuroscience from the University of Texas at Austin and leads the Changeis Emerging Disciplines Community of Practice (CoP). A behavioral scientist, author, and consultant with international expertise in organizational change, Dr. Lehrer directs our Planning, Policy, and Performance department at Volpe.



Beth Arnz

Beth Arnz is an engagement lead within the Changeis Mission Support Community of Practice (CoP). She has over 16 years of experience in service delivery and program management for the private sector and the Federal Government, including the FAA.

Contact Changeis

www.changeis.com

info@changeis.com

(703) 348-9669

Smart Transportation Reimagines R&D: Tackle Curves, Take Flight

“Transportation at its best facilitates the efficient flow of resources, the efficient movement of people, and the efficient utilization of time...It’s about the improvement of the human experience...”

– Hendrith Vanlon Smith, Jr.

A pivotal transportation transformation is underway. Smart Transportation reimagines—and positions—breakthrough improvements to move people and resources more safely and efficiently. Changeis is driving research and development in collaboration with our clients and partners to envision and realize this next generation within reach. At Changeis, we are working today to create smart solutions that ready tomorrow for seamless transport and logistics integration. Paving the way, spreading wings, making the impossible, possible.

What is Smart Transportation?

Smart Transportation aligns integrated, emerging technologies with strategic planning and leadership to evolve, optimize, and manage high performance transportation solutions. Components are selected from an ever-growing toolbox to build systems-based solutions. Elements include, for example, Wi-Fi, cellular, microwave, systems architectures, standards, identifier registries, security credentialing, block chain, data distribution systems, and other emerging Internet of Things (IoT)-enabling technologies. Elements fuse through interoperable frameworks to create smart transportation ecosystems that position agencies, industry, and end users to realize significant advances to safety, service, and business performance.

Smart Airports, for example, are based on the use of intelligent systems that link sensors and devices configured for use with different applications to control, manage, plan, and integrate airport operations in a centralized digital environment. Similarly, intelligent—or smart—transportation systems being developed to navigate surface roads will link data-rich digitized mappings of the driving environment with localized rules of the road served to end users, vehicles, and other transport modes and providers.

Research and Development Reimagined for Tomorrow

People and cargo are—and need to be—on the move again. At the Federal Aviation Administration (FAA), applied R&D supports policy development, regulations, certifications, guidance, and standards that increase safety and modernize the National Airspace System (NAS). Changeis provides analytical and programmatic support to both the FAA's R&D and Technical Operations organizations.

Meanwhile, the Changeis team supports Volpe's National Transportation Systems Research Center and DOT's Intelligent Transportation Systems (ITS)-Joint Program Office (JPO), maintaining and enhancing data architectures, standards, and information portals to advance capabilities and interoperability in the Connected/Automated Vehicle (CAV) space.

“Elements fuse through interoperable frameworks to create smart transportation ecosystems that position agencies, industry, and end users to realize significant advances to safety, service, and business performance.”

Our Innovation

At FAA, Changeis captures new opportunities to streamline processes and data with Configuration Management Automation (CMA). CMA benefits include automated and integrated enterprise solutions to support Configuration Management (CM) of FAA assets and investments as well as top-down system hierarchy traceability within the tool.

Advancing modernization, in August the FAA presented Congress with the [National Aviation Research Plan \(NARP\) for Fiscal Years 2022-2026](#)¹. The research and goals highlighted in the NARP support strategic visions laid out by the President, Secretary of Transportation, and FAA Administrator to ensure continued aviation capacity, safety, and efficiency in the United States. Changeis assists the FAA to coordinate, plan, report, and communicate the FAA R&D portfolio, enabling FAA to better position and implement emerging aviation technologies and goals.

For Volpe and ITS-JPO, we collaborated with colleagues to develop, integrate, and categorize a Management of Electronic Traffic Regulations (METR) Concept of Operations (ConOps). We are now focused on the systems requirements and systems architecture to enable a system configuration that ensures vital performance, integrity, and security. This positions interface specifications and region-specific implementation as CAV capabilities and access progress.

How Else Do We Foster Innovation?

The FAA's R&D portfolio development process improves strategic planning, budget formulation, program execution, and program evaluation. This increases return on taxpayer investment; enhances productivity; and ensures R&D program relevance, quality, and performance. Over the past few years, both airport management and the construction of new airports have evolved, with innovative technological systems that enable monitoring, process automation and control to be carried out in these spaces.

Research highlighted in the NARP for FY2022 through 2026 fell into six domains:

- *aerospace performance and planning,*
- *aircraft safety assurance,*
- *airport infrastructure and technologies,*
- *digital systems and technologies,*
- *environmental and weather impact mitigation, and*
- *human and aeromedical factors.*

At the same time, a significant CAV challenge requiring innovative planning and engagement beyond critical technological advances, policy innovation, and even system deployment, becomes...ultimately...adoption! Indeed, ecosystem trustworthiness is utmost to advance ITS utilization and success. Interestingly, Gartner² notes that, “By 2025, more than 15% of newly produced vehicles will have SAE L3 or higher autonomous driving hardware capability, up from 0.1% today.” At SAE L3, the automated features drive the vehicle under limited conditions. Even here (SAE L5 automated features drive the vehicle under all conditions) end user trust is essential, and we’re working toward that goal now. Put another way, even after the technology and logistics are developed, ironed out, regulated, and deployed, *if you build it, will they come?*

For example, myriad rules for freight vehicles; kerbside, lane, and public transport usage; micro mobility; ride sharing; road works; and vulnerable road users (VRUs) are important, requiring access by transport user systems such as ADS-equipped vehicles, driver support systems, nomadic devices, and sidewalk delivery robots. Applying lessons learned from the ConOps, Changeis is helping craft the System of System Requirements (SoSR), including the four system levels: translation, distribution, the user system, and discrepancy handling.

Connecting the Dots

Team Changeis is helping agencies and industry realize intelligent-based approaches for transportation sustainability and differentiation. Smart Transportation solutions will shape a reimagined system to keep our world moving. These technologies will help operators improve passenger experience, operational efficiencies, and compliance, forming the bases for future growth and innovation.

REFERENCES

²Emerging Technologies and Trends Impact Radar: Autonomous Vehicles; Gartner, ID G007419705; August 2021

Changeis' Core Capabilities

Strategy & Change Management

Changeis develops and executes strategies to maximize our customers' success. We apply in-depth industry knowledge, analytics expertise, and strategic acumen to design the right solution for their unique needs. Once the strategy is in place, we help customers communicate these changes and promote adoption among stakeholders.

Large Scale IT Solutions

In the age of digital business, organizations need highly flexible and responsive IT capabilities. This often means modernizing their legacy technology.

Changeis realizes large-scale IT transformation projects from conception to implementation – resulting in efficiency, automation and streamlined workflows through digital operations.

Investment & Acquisition Management

We help organizations obtain the resources they need to implement their strategic plans and initiatives. Rigorous data management, analytics tools, and compelling writing form the bedrock of our deliverables for customers.

Program Management Office (PMO) Support

We provide governance to ensure that strategies are implemented effectively, and that deliverables support organizational goals. Our services include resource management, risk management, performance management, and portfolio and program development and management.

Innovation & Optimization Management

There are major optimization opportunities within every organization. We help our customers identify and capitalize on them. Examples of some of our toolkit include Life Cycle Planning and Support, Technology Strategy and Systems Integration, Business Intelligence and Supply Chain Management.