

Greg Winfree is a highly recognizable and well-respected figure at the ITS World Congress and, when I met him at the latest edition of the annual event, which took place in Copenhagen in September, he was as open, genial and enthusiastic as ever about the potential of transportation to create a better world. Last time I interviewed Winfree, in 2015, he was serving in the Obama administration as assistant secretary for research and technology at USDOT. In December 2016, as Washington prepared for a political changing of the guard, Winfree shipped out, taking up his current role as director of the Texas A&M Transportation Institute (TTI), which he sees as a logical progression from his role in government.

“At USDOT I had responsibility for a multidisciplinary, multimodal research portfolio stretching across the entire department,” he says. “The opportunity which presented itself at TTI was in perfect alignment, a continuation of the same mission – same communities, same issues. TTI has a long history in transportation infrastructure – pavement materials, roads and bridges. We’re involved in all facets of transportation – from policy research to data science. Those areas are always important, especially as we begin to grapple with what we called the ‘data tsunami’ at USDOT. As all this electronic wizardry hits our roadways, a tremendous amount of information will be generated; managing and mining it will be a significant task.”

Winfree has no wish to dwell in the past, but rather seeks to position TTI in a forward-looking role. Ideas that may now seem far-fetched, such as airborne urban



From USDOT to Texas A&M Transportation Institute, Gregory D Winfree remains one of today’s leading figures in mobility research

Interviewed by Tom Stone

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transit via ‘drone-taxis’, may be deployed quicker than people think, he suspects. Soon research could be turned to developing the solutions these new modes will demand – such as three-dimensional traffic management systems.

Winfree is proud of the many institutions with which TTI is affiliated, including Safe-D, CARTEEH and the Center for Infrastructure Renewal (see *How the Institute is growing*, below right). But the conversation seems to circle back to a subject that has long been central to Winfree’s vision: connected autonomous vehicles (CAVs).

Planning a connected future

“Two areas I took a great interest in at USDOT were connected vehicles and managing the civil equities in GPS,” he recalls. “Those two technologies will be critically important as AVs become more of a reality and less of a test scenario. Global satellite systems providing that navigation – whether it’s GPS, Galileo in Europe, BeiDou in China, or even the GLONASS signal provided by the Russians – will be key as self-driving technologies roll out. You can’t navigate if you don’t know where you’ve been or where you’re going. Those components are right at the heart of what we do in the World Congress community.”

As a big fan of two-wheeled motorized transportation, Winfree was once dubbed ‘President Obama’s man on a motorbike’, and flashes a broad grin at the mention of motorcycles. “We’re renowned for our crash-test program; many safety innovations you see on roadsides were developed at TTI,” he says. “One recent crash test concerned how to prevent motorcyclists being ejected over Jersey barriers and what mitigation technologies can be put in place.” Warming to the subject he remembers the connected motorcycle initiative launched by BMW, Honda and Yamaha at the 2015 Bordeaux ITS World Congress. “That’s still near and dear,” he says. “I’ve engaged with Honda about how it can remain impactful; I don’t want to see those issues tabled until the back-end of integration. Two-wheeled transportation is usually forgotten until the last moment, then everyone’s scurrying around to accommodate it. We have a green field with connected vehicles, so let’s get motorcycles in now and make sure they’re safe.”



Left: TTI’s new headquarters at the Texas A&M University System’s RELLIS Campus

How the Institute is growing

Founded in 1950, Texas A&M Transportation Institute (TTI) has conducted research in all 50 US states and more than 40 countries. With 700 projects each year covering every conceivable aspect of transportation, it has provided breakthroughs that have saved billions of dollars and thousands of lives. Since the start of 2017, it has had a new director – Greg Winfree, formerly of USDOT – who is brimming with enthusiasm.

“One of the most exciting things is our new corporate

headquarters,” Winfree says. “We’re a state agency affiliated with Texas A&M University, College Station. There’s a portion of the campus, formerly a World War II military base, now called RELLIS – standing for our core values of Respect, Excellence, Leadership, Loyalty, Integrity and Selfless Service. Situated there is our new Center for Infrastructure Renewal. That’s where our pavement materials laboratories are; a sensor lab for automated vehicle work will be commissioned; we’ve

got a smart grid, where we can look at issues impacting the electrical grid. It’s an extraordinarily exciting facility.”

“Our CAV work is moving apace and we’re working on truck platooning with Texas DOT,” he continues. “We also have two USDOT-sponsored transportation centers. One is Safe-D – that’s Safety through Disruption; the other is CARTEEH, focused on the confluence of public health and transportation, so very forward-thinking. There’s a lot going on that’s positive – it’s a great place to be.”

During the World Congress, we had both seen a demonstration of connected vehicles from Las Vegas, combining technologies from Cohda Wireless, Cisco Systems, NXP and Esri. The setup, relying on dedicated short-range communication (DSRC) technology, was impressive in its functionality and robustness. When I ask Winfree about the ongoing debate as to whether DSRC or potentially cheaper cellular technologies provide the best medium for CAV communication, it taps into a strong vein of conviction. He points to recent developments involving General Motors, Mercedes and Toyota fitting vehicles with DSRC as evidence that corporate enterprises are increasingly convinced of the benefits of DSRC for both shareholders and potential customers. DSRC also has the advantage of technological readiness which, for Winfree, carries with it a strong moral imperative.

“DSRC is the one technology that’s mature and ready to be rolled out – that can start saving lives tomorrow,” he says. “We lose 100 people each day on US roadways. That’s measurable: every day that we don’t have affirmative support for DSRC means 100 more families grieving loved ones.” For Winfree, safety provides the fundamental

Right: A computer-generated fly over of the Texas A&M RELLIS Campus



“DSRC is now being installed in GM, Mercedes and Toyota vehicles. Corporate enterprises are about returning value to shareholders, so they don’t take these decisions lightly

raison d’être for connected vehicles and the immediate, human dimension overrides arguments for ongoing ‘technology agnosticism’ professed in some quarters. “If 5G becomes the next wave of technology, then fine. But I’ve been sitting on panels where we’ve recognized that they’re already talking about 6G and C-V2X. These technologies are promising; they should be investigated and, as they come down the line, implemented if appropriate. But they’re not ready to be implemented tomorrow.”

Beyond the safety imperative, Winfree sees other compelling arguments favoring DSRC. For one, it can enable the ITS community to begin convincing the public of the benefits of connectivity. “It gets us out of the ideation of what connected vehicles are about and allows us to say, ‘From this point on, the technology is going to be available to start improving efficiency and saving lives.’” He also emphasizes the collaborative nature of CAV development, involving both governments and corporate partners worldwide. “It would be a disservice to all parties not to have an affirmative move regarding DSRC,” he says. “They can’t operate in an uncertain environment.”

Spectrum sharing

The same argument applies to debates that are still ongoing surrounding sharing or splitting the 75MHz spectrum range

US\$350m

The price tag on building Texas A&M’s new RELLIS Campus, which includes a test track and proving ground for connected and autonomous vehicles



RELLIS world

The US\$80m Center for Infrastructure Renewal was the first new facility to open on the redeveloped RELLIS Campus in April 2018. Authorized by the Texas Legislature, the center will develop new methods and better materials for the nation’s ailing infrastructure and train the private sector in how to apply new techniques and materials. Other major transportation-related research and testing facilities located at the RELLIS Campus are TTI’s Environmental and Emissions Research Facility, Sediment and Erosion Control Laboratory and Roadside Safety and Physical Security program.

allocated for ITS DSRC communications with other commercial non-transportation industry players. Winfree believes dividing the available bandwidth would undercut the potential benefits of DSRC connected vehicles by congesting the spectrum. He also finds hypothesized solutions for sharing the spectrum that involve ‘sense, detect and avoid’ mechanisms unconvincing, being liable to result in denial of service situations. However, he is hopeful such debates will soon be settled and returns to his earlier point about GM, Mercedes and Toyota backing DSRC as evidence that the technology is really now beginning to gain traction. “Corporate enterprises are about returning value to shareholders, so they don’t take these decisions lightly,” he notes.

For now, Greg Winfree is relaxed and avuncular, very much at ease amid his peers in Copenhagen “Having been leader of the USDOT delegation means a lot of folks at the World Congress know who I am,” he says. “I think I built a good reputation at DOT for being an advocate, but a responsible advocate – not a firebrand. Those who remember Orlando 2011 may recall a wide-eyed gentleman, only in the job two weeks, having to address 8,500 people! It’s an organization and a mission that I hold near and dear, as we look at roadway safety, increasing efficiency, congestion mitigation, and all those topics that bedevil us now.” ○