



Nissan, Savari, UC Berkeley and the City of Sunnyvale Announce Real-World V2X Testbed

Smart City Initiatives Deliver Innovative Solutions for Easing Traffic Congestion, Enhancing Emissions and Public Safety

SANTA CLARA, CA--March 29, 2016 - Nissan Motor Company, Savari Inc., a leader in V2X (Vehicle-to-Everything) safety communication technology, UC Berkeley Partners for Advanced Transportation Technology (PATH), a leader in intelligent transportation systems research, and the City of Sunnyvale collaborated on a real-world V2X testbed spanning 4.63 square miles with three public intersections in Sunnyvale, California. Savari's smart city deployments now span 130 public square miles of roadways. Prompted by Nissan's vision initiative to establish a V2X testbed, PATH deployed Savari StreetWAVE™ road-side-units (RSUs) and coordinated with the City of Sunnyvale and Nissan on the project, which started in August 2015 and is continuing to provide data today.

This V2X testbed demonstrates how data can be reliably exchanged between moving vehicles and fixed wireless infrastructure using the DSRC (Dedicated Short-Range Communications) -- 5.8 GHz band. The data that's collected is analyzed for improving real-time traffic flow to planning transportation infrastructure investments. Furthermore, as Nissan continues to advance technologies for autonomous driving systems, the availability of V2X communication can further enhance the capabilities of autonomous cars.

Since its rollout, the City of Sunnyvale pilot is examining the role of V2X communications and its potential benefits on easing traffic congestion, and enhancing fuel economy and public safety. For example, Sunnyvale's Transportation Division is leveraging the data to enhance the operation of current traffic light intersections and readying them for fully autonomous vehicles. V2X technology integrates with the city's traffic controllers, exchanging data between vehicles and traffic signals and between traffic signals and vehicles using radio sensors. Nissan participated in the project with interest in further evaluating DSRC technology -- a medium-range wireless communication channel dedicated to cars to provide communications from vehicle to another vehicle or to roadside infrastructure -- as a potential V2X system that can be deployed today.

As vehicles are becoming increasingly connected, cities are deploying more intelligent transportation services to connect cars to their surrounding environment. The City of Sunnyvale is an innovator in establishing one of the first V2X testbeds in a real-world environment. By partnering with the private sector to evaluate new technologies, the City of Sunnyvale, is taking a leadership role in seeing how they can potentially apply new technologies that can benefit the entire community while gaining valuable experience.

With many communities experiencing rapidly growing demands on their transportation infrastructure in the next few decades, the U.S. Department of Transportation (USDOT) launched its Smart City Challenge (<https://www.transportation.gov/smartcity>). The USDOT's Smart City Challenge is a nationwide competition that's designed to address these challenges by taking a look at how new technologies can better connect transportation assets into an interactive network.



78 medium-sized cities (see USDOT list here: <https://www.transportation.gov/smartcity/applicant-list>) submitted a proposal before the Feb. 4 deadline with the hope of winning the \$50 million grand prize and the opportunity to deploy new safety and emissions technologies in their city.

In addition, the U.S. Government recently laid out its vision for building a 21st century transportation system that includes a 10-year, nearly \$4 billion investment (<https://www.transportation.gov/briefing-room/secretary-foxx-unveils-president-obama%E2%80%99s-fy17-budget-proposal-nearly-4-billion>) to accelerate the development and adoption of safe vehicle automation through real-world projects.

Savari is a leading provider of V2X communications technology with 90 percent of installed road-side-units (RSU) and 50 percent of on-board-units (OBU) in six major public testbeds across the U.S. The company's V2X testbed milestones include:

- Over 14.9 million miles of public OBU testing
- 391 thousand hours of public OBU testing and
- 130 public square miles road covered by RSUs

Comments on the News:

"As we continue to develop autonomous drive technologies to roll out in the next four years and beyond, we know that it's important to consider the use of AI technology in autonomous city driving," said Dr. Maarten Sierhuis, research director, Nissan Research Center -- Silicon Valley. "This real-world testbed around our research center allows us to do this kind of research extremely efficiently as we study how V2X technology can be used as additional sensor data by the autonomous system. We're also looking at how connected infrastructure and AI can be used to optimize both route planning for an autonomous vehicle and traffic flow along the way."

"We have the V2X expertise in deploying road-side-units, analyzing the collected data and turning it into actionable information for cities that can improve traffic, air quality and safety," said Ravi Puvvala, CEO of Savari. "The City of Sunnyvale is progressive with its vision for building a 21st century transportation system. We thank our partners PATH and Nissan for their collaboration on this important V2X pilot."

"As the heart of Silicon Valley, Sunnyvale is always focused on ways to create a smarter, safer and more connected city," said Glenn Hendricks, Mayor of Sunnyvale. "Participating in pilot projects like this is a real win-win -- not only does it support cutting-edge technology for the future, it provides us with practical data we can use today to make our roadways safer and more efficient for the community."

"We're dedicated to developing advanced solutions that address the growing demands that are placed on California's roadways, and we are particularly appreciative of the opportunity to work with Nissan and other partners to explore the deployment of V2X technologies, said Dr. Ching-Yao Chan, Program Leader, Safety, at UC Berkeley PATH. "The City of Sunnyvale presented us with a challenge that many California cities are facing -- how to manage projected traffic growth with current roadway infrastructure. The results of this V2X testbed will go far beyond Sunnyvale as municipalities across the Golden State are looking to deploy smart city technologies and practices."

**About Savari, Inc.**

Savari seeks to make the world's roadways smarter and safer by deploying advanced wireless sensor technologies and software for V2X environments to support a growing portfolio of intelligent transportation services. With more than 150 man-years of V2X learning and development and 15 million-plus miles per year of public testing, Savari is a leader in V2X technology. Savari is headquartered in Santa Clara, Calif., and has offices in Detroit, Mich., Seoul, Korea and Bangalore, India. The company is comprised of a core team of industry veterans from the automotive, semiconductor, software and telecommunications industries. Savari is partnering with automotive OEMs, system integrators, chipset vendors and industry groups like the U.S. Department of Transportation. For more information, visit savari.net.

About Nissan North America

In North America, Nissan's operations include automotive styling, engineering, consumer and corporate financing, sales and marketing, distribution and manufacturing. Nissan is dedicated to improving the environment under the Nissan Green Program and has been recognized annually by the U.S Environmental Protection Agency as an ENERGY STAR® Partner of the Year since 2010. More information on Nissan in North America and the complete line of Nissan and Infiniti vehicles can be found online at www.NissanUSA.com and www.InfinitiUSA.com, or visit the U.S. media sites NissanNews.com and InfinitiNews.com.

About Nissan Motor Co.

Nissan Motor Co., Ltd., Japan's second-largest automotive company, is headquartered in Yokohama, Japan, and is part of the Renault-Nissan Alliance. Operating with more than 247,500 employees globally, Nissan sold 5.32 million vehicles and generated revenue of 11.38 trillion yen (USD 103.6 billion) in fiscal year 2014. Nissan delivers a comprehensive range of more than 60 models under the Nissan, Infiniti and Datsun brands. Nissan leads the world in zero-emission mobility, dominated by sales of the LEAF, the first mass-market, pure-electric vehicle. It is the best-selling EV in history with almost 50% share of the zero-emission vehicle segment.

For more information on our products, services and commitment to sustainable mobility, visit our website at www.nissan-global.com/EN/.

About California PATH

California Partners for Advanced Transportation Technology (PATH), a research and development program of the University of California, Berkeley, has been a leader in Intelligent Transportation Systems research since its founding in 1986. In collaboration with the California Department of Transportation (Caltrans), administered by the university's Institute of Transportation Studies (ITS), PATH is a multi-disciplinary program with staff, faculty, and students from universities worldwide and cooperative projects with private industry, state and local agencies, and nonprofit institutions.

Over the last three decades, PATH has been dedicated to applied research and field implementation of automated and connected vehicles. The organization is renowned for its expertise in both research and deployment and is redefining the concept of "intelligent transportation systems" to meet the realities of the Information Age.

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