CASE 4 DETAILS: VIRGINIA TECH TRANSPORTATION INSTITUTE (VTTI)

The Deployment of Driverless Operations towards Improving Accessibility and Mobility for the Disabled

<u>Description:</u> The past six years we have all observed a dramatic increase in global activity surrounding the development of vehicles functioning under driverless operation. Technology has finally caught up allowing for significant advancements in sensors and computing power, thus catalyzing the opportunities that the automotive industry is most certainly taking advantage of. Opportunities such as significantly reducing human error involved in crashes (highest contributing factor to crash risk), creating new mobility options for those who can't drive, and opening up new business models for servicing society in innovative ways. Currently the industry is focused foremost on serving highly populated regions through the deployment of driverless operations for the taxi services use case. This early adopter market segment has many benefits, the most critical of which is a business model that allows for a positive return on investment for such a costly endeavor. However, there is one area that is missing focus that could use significant attention earlier rather than later, and that is deploying driverless operations towards improving accessibility and mobility for people with disabilities.

Driverless operations have the potential to not only provide unique and novel affordances for permanently disabled people, but also for people who have been temporarily injured and require mobility support. Disabilities are a worldwide transportation concern. It has been estimated that approximately 1 in 5 people [19%] in the U.S. has a disability (U.S. Census Bureau, 2012), and at least 7% of people in China are reported to be disabled. In the U.S., 2-3% of the population are estimated to be blind (NFB, 2014), and over 16% who have some type of physical functioning disability (CDC, 2015). Imagine the benefits that self-driving technology could provide for the disabled. Imagine helping people who by virtue of their disability have never had true independence of mobility.

Although the automotive industry is moving quickly on the advancement of driverless operations, a focus on serving people with disabilities will unfortunately lag behind. VTTI is dedicated to our university motto "Ut Prosim" (That I May Serve). We believe that a new global commitment to this topic is required. VTTI is a global top three transportation research institute trusted by literally hundreds of sponsors throughout government and industry and thousands of contacts around the world. We are in a unique position to act as a catalyst through uniting transportation

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About:

Virginia Tech Transportation Institute conducts research to save lives, time, and money and protect the environment. As one of seven premier research institutes created by Virginia Tech to answer national challenges, VTTI is continually advancing transportation through innovation and has affected public policy on national and international levels. VTTI has grown from approximately 15 faculty, staff, and students to become the second largest university-level transportation institute in the U.S. with over 500 employees.

Website:

https://www.vtti.vt.edu/

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stakeholders around the world, and move this center stage. A successful effort in this area will unofficially put VTTI as the "go-to" research organization for leveraging automation towards improving the human experience.

Challenge: How can VTTI catalyze this issue of designing and deploying services under a driverless operation model for the disabled?

- Are there certain segments of the disabled population that should be prioritized? Why?
  - What will be the challenges that disabled riders encounter when using driverless operation vehicles (ride-hailing, pre-boarding communication, navigation, safe disembarking, localization?
  - Which geographic regions around the globe? Why?
- How do we engage industry stakeholders (original equipment manufacturers, suppliers, tech companies) to prioritize this opportunity?
  - What are the "carrots" that can elevate the importance of this customer segment?
- What are key public agencies and organizations that VTTI can bring together?
  - Federal agencies (USDOT, NSF, NIH, NFB)?
  - Regional agencies (state DOTs, municipalities)?
- Are there resources beyond VTTI's current portfolio that are needed to accelerate research in this area?
- What key relationships/partnerships are required?