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Autonomous Vehicles and the Blind: Expanding Opportunities for Full Integration

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For most of recorded history, it was assumed that blindness rendered people entirely dependent on their families for care and support. Blind people's limitations were presumed to be the inevitable consequence of the disability. There was little or no thought given to adaptations or accommodations. For example, since sight was required to read printed books, it was assumed that blind people could not read and therefore were severely limited in their ability to be educated. It was less than two centuries ago when Louis Braille developed a tactile reading system for the blind. Braille demonstrated that blindness was not an immutable barrier to literacy. Blindness only meant that blind people had to find a way of reading and writing that did not require sight.

Over time, blind people developed techniques and strategies to enhance their independence. In addition to braille, many blind people used white canes to enable them to travel safely and independently. Still, in spite of greater independence, the idea of accommodations was not widely known or accepted.

Consumer organizations of blind people and others with disabilities gradually began to advocate for accommodations that would support greater independence. Central to their advocacy was the idea that exclusion and isolation were not the natural consequence of disability but the result of social attitudes about blindness. The idea that a large part of the denial of opportunities was socially constructed led to the idea of universal design.

Prior to that time, accommodations were seen as an extra cost and frequently as an unreasonable burden on society. Accommodations were not viewed as a human and civil

right but as something peripheral to everyday life. Universal design changed the paradigm. The idea of universal design was rooted in the belief that society benefits when the greatest number of its members are able to participate in all aspects of social and economic life. Instead of being an added cost, the idea of designing the built and social environments to be broadly inclusive gradually became viewed as a benefit, not a burden.

The World Health Organization estimates that there are 253 million blind and partially sighted people around the world. With the advent of autonomous vehicles, blind and partially sighted people represent a new customer base. At present, when a vehicle manufacturer introduces a new technology, such as electric or hybrid electric cars, they are marketing to the same customer base. In other words, the customer decides whether to buy a vehicle with a conventional internal combustion engine or one that operates entirely or in part on electric power, but it is the same customer. The goal of the automobile manufacturer is to keep the customers it has and, if possible, to attract customers away from its competitors. Either way, it is a zero-sum game. The same customers may buy different products from different manufactures, but the overall number of buyers does not appreciably change; however, autonomous vehicles open a new and large potential market, namely blind and partially sighted people.

At one time, product manufacturers offered a basic model and charged extra for additional features. The base model was functional, but if the customer wanted a radio, air conditioning, power windows, etc., the customer had to pay extra. This approach continues in some products, but with the emergence of new technologies, the trend is toward products that appeal to the widest possible customer base. Many new products, including mobile phones, build in features that few smart phone users even know are available. Some of the basic functions are widely used, but smart phones also include features that only appeal to a very small number of potential buyers. Still, it is more cost-effective to include as many features as possible to attract the maximum number of customers. While not typically thought of as an example of universal design, the trend for technology products to include a large number of features demonstrates the efficacy of designs that appeal to the widest possible number of potential customers. It logically

follows that automobile manufacturers would be well advised to address accessibility and usability as they design autonomous vehicles.

Accessibility is fairly straightforward. It is anticipated that autonomous vehicles will be heavily used by rideshare companies. The blind person will need an accessible way to call the autonomous car, will need to be able to tell the car where to go, and will need to know when the car is at its destination and not just stopped in traffic. Beyond vehicle operations, blind users will need to be able to set the temperature inside the car, will need to be able to select the music they wish to have played, and so on. These are examples of accessibility design issues, and they are not complicated or difficult to address.

Usability refers to things that make the vehicle practical to use. For example, when a rideshare, vehicle arrives to pick up the passenger, the blind person will need to know not just that the car has arrived but where the car is. Blind people will have to be able to identify their rides from other vehicles in the area.

While usability is critical to the 253 million potential new blind vehicle customers, it is also something of general importance. Right now, rideshare apps tell customers the make, model and license plate number of their rides. Imagine a sports event and a dozen or more sighted customers running up to black Toyota Priuses looking for a matching license plate number. Technology that enables users to find their vehicles is a usability issue for all customers but is particularly critical for blind and partially sighted users. Designing in a feature that helps customers locate their rideshare autonomous vehicles is an example of universal design, making the system work efficiently for the greatest number of potential customers. It is not an act of charity but a sound business decision.

The challenge of designing in accessibility and usability is not complicated nor expensive. It does require thought and a fundamental change in our thinking about blind and partially sighted people and others with disabilities and their need for accessible products. Sadly, today far too often accessibility continues to be an afterthought and is viewed as something extra and costly. That is a social benevolence model of disability. It presumes

that accessibility is an extra cost that will not enhance profits but diminish them. Accessibility is viewed as something that does not benefit the bottom line and is only important if required by national laws or regulations. Manufacturers, including manufacturers of autonomous vehicles, would be wise to replace the social benevolence mindset with an economic benefit mindset. Blind people represent a quarter of a billion new customers. Designing in accessibility and usability is good business, not an act of charity.

What is needed is an awareness of the buying potential of people who heretofore were unable to operate vehicles independently. Vehicle manufacturers have the choice of being on the forefront of attracting hundreds of millions of new customers or waiting until they are compelled to build in accessibility by national governments. The choice is theirs.

Applying the concepts of universal design to the development of autonomous vehicles will benefit everyone: the vehicle manufacturers, the general public, and blind and partially sighted people. It is neither rational nor cost-effective to restrict people's ability to participate fully in social and economic life. Inclusion is a social benefit but not an economic burden; it strengthens society and honors the value of all people. It is the right thing to do, the smart thing to do, and it is a sound business decision.