Technology snapshot in Minneapolis

THE PACE OF TECHNOLOGICAL CHANGE IN TRANSPORTATION

The pace of change in technology that impacts transportation options has been increasing. Transportation options have been increasing due to new models enabled by a few technological improvements that have enabled all new shared modes – smartphones, wifi and 5G network. The impacts of innovation can mean something that was not on our streets five years ago (scooters) are now commonplace. Focusing on preparing and setting goals allows us to effectively regulate and manage these service models through policies and design.

Figure 13: Timeline of advanced mobility

The pace of local adoption of national advancements is nearing a balance LOCAL NATIONAL 1997 The transportation landscape has rapidly evolved in the last twenty years and at a rate not experienced since the introduction of the automobile. Growth in Vehicle | December 1997 1998 shared mobility, electrification, and connected/automated vehicle technologies Toyota Prius debuts as the first mass-produced gasoline electric and services are introducing more mobility choices, and changing people's hybrid vehicle transportation behavior. Carshare Portland launches as the nation's first car share 1999 Shared onnected Infrastructure | March The City of San Francisco installs the nation's first large-scale system of Audi-ble Pedestrian Signals (APS) with countdown timers 2000 Electric 2001 Automated/ Connected 2002 2003 Bike Share | August 2008 2004 SmartBike DC launches in Washington DC as the nation's first modern bike Connected Infrastructure | December 2009 Marq2 transit corridor features NextTrip signs with real-time bus share arrival/departure information 2005 Nice Ride Launches bike share 2006 ected Infrastructure | 2011 The City of Minneapolis installs state of the art Traffic Management Center 2007 Autonomous Vehicles | January 2009 Google begins testing autonomous vehicles The City of Mineapolis installs its first push-button activated bicycle traffic signal at the intersection of 5th St NE & Broadway St NE 2008 Uber launches ride hailing service in Minneapolis Washington, Oregon and California become the first corridor coalition to 2009 Two-year car share pilot begins with HOURCAR, Zipcar and car2go commit to building a multi-state highway electric charging corridor along I-5 from Canada to Mexico 2010 Lyft launches ride hailing service in Minneapolis Uber launches ride hailing service 2011 Metro Transit smartphone app allows electronic payment Lyft launches ride hailing service Ride Hail | Nov 2012 MnDOT joins the Great Lakes Emission Corridor to facilitate electric vehicle Massachusetts Bay Transportation Authority launches the nation's first commuter rail ticketing smartphone app usage along Interstate 94 2013 The City of Mineapolis installs video-detection bicycle traffic signals along Washington Ave S from Hennepin Ave to 5th Ave S The City of Los Angeles becomes the first major city in the world to synchro-nize its entire traffic signal system (4,500 signals) 2014 AV shuttle (EZ mile) available for public demonstration on Nicollet Mall during Super Bowl LII (52) Zyp BikeShare launches in Birmingham, AL as the nation's first large-scale e-bike pedal assist bike share 2015 City of St. Paul awarded federal funding to deliver electric vehicle carsharing Chevy Bolt debuts as a zero-emission all-electric vehicle with a 200+ service in partnership with the City of Minneapolis, HOURCAR and Xcel Energy mile range 2016 ehicles | April 2018 AV shuttle (EZ mile) available for public demonstration on Midtown Greenway Bluegogo launches in San Francisco as the na-tion's first dockless bike share ous vehicles | May 2018 2017 City of Minneapolis implements multi-modal counting program (Miovision) us Freight | January Starship Technologies tests sidewalk delivery robots in Washington DC through video software imagery evaluation ous Freight | March 2017 Auton 2018 City of Minneapolis launches shared electric scooter pilot program with 400 scooter cap Amazon begins testing drone delivery Connected Infrastructure | August 2018 MnDOT connected corridor project begins installing Vehicle-to-Infrastructure (V2I) technology along Olson Memorial Highway MN-55, allowing optimized signal timing Electrify America begins development of national electric vehicle charging 2019 station network; a \$2 billion, 10-year investment for snow plow and other service vehicles. July 2017 Los Angeles Country Metro Transportation Authority adopts plan to trans tion entire bus fleet to zero-emission all-electric by the year 2030 Xcel Energy launches the Electric Vehicle Service Pilot Program, which provides at-home installation of level-2 electric vehicle charging stations (4-6 hour full charge time) ructure | August 20 Bird launches in Santa Monica, CA as the nation's first scooter share Nice Ride adds dockless bikes to their bike share program Los Angeles Mayor Jerry Brown signs executive order committing the state of California to a goal of 5 million zero-emission vehicles on the road by 2030 Metro Transit begins transition to zero-emission all-electric bus fleet by debuting new electric bus for BRT C-line Autonomous Vehicles | Decemb ar 2018 Waymo announces the nation's first commercial autonomous ride hail se MnDOT announces plans to increase electric vehicle registration statewide to 200,000 vehicles by the year 2030, up from almost 7,000 electric vehicles will operate in multiple cities in Arizona registered in the state in the year 2018 ous Freight | Dece Nuro launches pilot for autonomous delivery cargo vehicles City of Minneapolis relaunches shared electric scooter pilot program with 2,000 scooter cap ous Vehicles | January 2019 Uber Elevate announces an aerial ride hailing service with plans to offer rides in the next 5-10 years

ACCESS TO TECHNOLOGY

Access to technology is critical to ensuring everyone benefits from new transportation options. As shared mobility services grow in popularity, solutions for those without smartphone and banking access are needed. In the City of Minneapolis, 23.3% of households do not have access to a smartphone.¹²

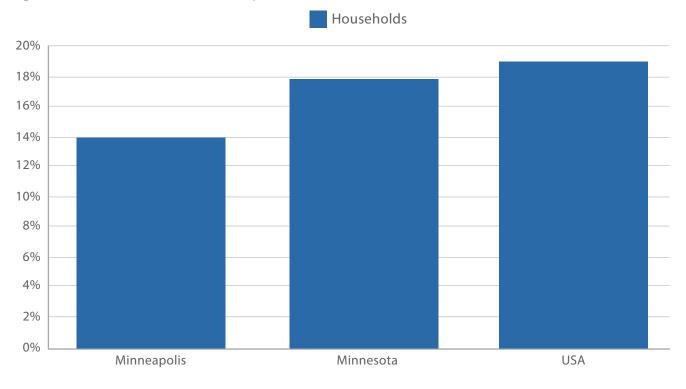
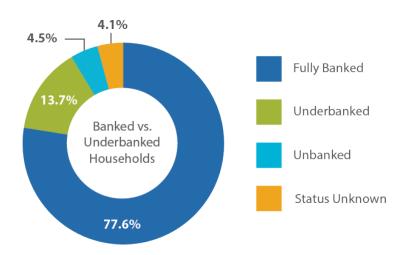


Figure 14: Households without smart phone access

Additionally, in the Twin Cities metro region, 1.5% of households are categorized as unbanked, meaning they are not a member of a bank or similar financial institution.¹³ These groups are limited in their ability to utilize popular shared mobility services which typically require a smartphone and banking access. For this survey, the term underbanked refers to households that had an account at an insured institution but also obtained financial products or services outside of the banking system.¹⁴

- ¹² FDIC, 2017 Banking Status Survey
- ¹³ FDIC, 2017 Banking Status Survey
- ¹⁴ FDIC, 2017 Banking Status Survey

Figure 15: Banked and underbanked households



AUTOMATED TECHNOLOGY

Done correctly, automated vehicles could be a tool for future mobility that can be applied to a variety of service models, including transit, urban delivery and ride sharing. Despite much speculation around when the fully autonomous vehicle will enter the mainstream market, it is important to consider that the transition to full automation is an evolution. Vehicles currently operate on our streets that already have a certain level of automation inherent to them. Level 1 vehicles are those where the driver is in control, but some assistance is given – tools like adaptive cruise control, lane-departure assistance and automated braking to avoid collisions. Some new models of vehicles integrate Level 2 technologies, which automate both speed and steering. The integration of higher levels of automation will continue to impact all people who use the public right of way, including those walking, biking, taking transit and operating analog vehicles.

Figure 16: Levels of automation

