Study On Autonomous Vehicle Transportation System

Policy Implications of Autonomous Vehicles, Volume Five in the Advances in Transport Policy and Planning series systematically reviews policy relevant implications of AVs and the associated possible policy responses, and discusses future avenues for policy making and research. It comprises 13 chapters discussing: (a) short-term implications of AVs for traffic flow, human-automated bus systems interaction, cyber-security and safety, cybersecurity certification and auditing, non-commuting journeys; (b) long-term implications of AVs for carbon dioxide (CO2) emissions and energy, health and well-being, data protection, ethics, governance; (c) implications of AVs for the maritime industry and urban deliveries; and (d) overall synthesis and conclusions. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Advances in Transport Policy and Planning series Updated release includes the latest information on the policy implications of autonomous vehicles

This book presents a review of the progress and latest applications of artificial intelligence in autonomous vehicles and its implementation in new hardware platforms. Furthermore, new concepts for mobility services based on this technology are presented and the social and human factors are discussed.

Alex Davies tells the dramatic, colorful story of the quest to develop driverless cars—and the fierce competition between Google, Uber, and other companies in a race to revolutionize our lives. The self-driving car has been one of the most vaunted technological breakthroughs of recent years. But early promises that these autonomous vehicles would soon be on the roads have proven premature. Alex Davies follows the twists and turns of this story from its origins to today. The story starts with the Defense Advanced Research Projects Agency (DARPA), which was charged with developing a land-based equivalent to the drone, a vehicle that could operate in war zones without risking human lives. DARPA issued a series of three “Grand Challenges” that attracted visionaries, many of them students and amateurs, who took the technology from Jetsons-style fantasy to near-reality. The young stars of the Challenges soon connected with Silicon Valley giants Google and Uber, intent on delivering a new way of driving to the civilian world. Soon the automakers joined the quest, some on their own, others in partnership with the tech titans. But as road testing progressed, it became clear that the challenges of driving a car without human assistance were more formidable than anticipated. Davies profiles the industry’s key players from the early enthusiasm of the DARPA days to their growing awareness that while this spin on artificial intelligence isn’t yet ready for rush-hour traffic, driverless cars are poised to remake how the world moves. Driven explores this exciting quest to transform transportation and change our lives.

This book takes a look at fully automated, autonomous vehicles and discusses many open questions: How can autonomous vehicles be integrated into the current transportation system with diverse users and human drivers? Where do automated vehicles fall under current legal frameworks? What risks are associated with automation and how will society respond to these risks? How will the marketplace react to automated vehicles and what changes may be necessary for companies? Experts from Germany and the United States define key societal, engineering, and mobility issues related to the automation of vehicles. They discuss the decisions programmers of automated vehicles must make to enable vehicles to perceive their environment, interact with other road users, and choose actions that may have ethical consequences. The authors further identify expectations and concerns that will form the basis for individual and societal acceptance of autonomous driving. While the safety benefits of such vehicles are tremendous, the authors demonstrate that these benefits will only be achieved if vehicles have an appropriate safety concept at the heart of their design. Realizing the potential of automated vehicles to reorganize traffic and transform mobility of people and goods requires similar care in the design of vehicles and networks. By covering all of these topics, the book aims to provide a current, comprehensive, and scientifically sound treatment of the emerging field of “autonomous driving".

Driving automation and autonomy are already upon us and the problems that were predicted twenty years ago are beginning to appear. These problems include shortfalls in expected benefits, equipment unreliability, driver skill fade, and error-inducing equipment designs. Designing Interaction and Interfaces for Automated Vehicles: User-Centred Ecological Design and Testing investigates the difficult problem of how to interface drivers with automated vehicles by offering an inclusive, human-centred design process that focusses on human variability and capability in interaction with interfaces. This book introduces a novel method that combines both systems thinking and inclusive user-centred design. It models driver interaction, provides design specifications, concept designs, and the results of studies in simulators on the test track, and in road going vehicles. This book is for designers of systems interfaces, interactions, UX, Human Factors and Ergonomics researchers and practitioners involved with systems engineering and automotive academics._ "In this book, Prof Stanton and colleagues show how Human Factors methods can be applied to the tricky problem of interfacing human drivers with vehicle automation. They have developed an approach to designing the human-automation interaction for the handovers between the driver and the vehicle. This approach has been tested in driving simulators and, most interestingly, in real vehicles on British motorways. The approach, called User-Centred Ecological Interface Design, has been validated against driver behaviour and used to support their ongoing work on vehicle automation. I highly recommend this book for anyone interested, or involved, in designing human-automation interaction in vehicles and beyond." Professor Michael A. Regan, University of NSW Sydney, AUSTRALIA

Since the invention of the modern car in 1886 by Karl Benz, it has been bringing pleasure to every one of us. For nearly 130 years, the automotive industry has been a force for innovation and economic growth. Now, in the 21st century, the pace of innovation is speeding up and the automotive sector is facing a new kind of technological revolution as it approaches “fully autonomous vehicles”. Self-driving vehicles clearly impact the experience of passengers. Sooner or later, it may become possible for automobiles to drive

autonomously and successfully to their destinations. How will this technology change the relationship between people and their automobiles? How will self-driving vehicles change the transportation sector and our freedom of mobility as we know it today? If autonomous cars succeed, how will they change our world? This book has a focus on autonomous driving from various perspectives; it looks at what an autonomous car is and how it may come to be commonplace on our roads, as well as the factors that could prevent its development and adoption. It also reviews the potential benefits of these vehicles and how they might impact different aspects of our lives. The book also examines the challenges and hurdles that face driverless vehicles and considers some solutions to these obstacles to enable successful market penetration. Aside from the social and economic consequences of autonomous vehicles, this book also emphasizes the technical point of view. It describes the technological inventions and engineering concepts which are necessary to operate self-driving vehicles. In summary, this book provides a comprehensive overview of the current state of the art in driverless cars and makes some projections for the future. Autonomous cars no longer exist merely in the minds of children and science fiction writers. They are real and will be on roads sooner than you think

Winner of the 2018 CCCC Technical and Scientific Communication Award in the category of Best Book in Technical or Scientific Communication Responding to the effects of human mobility and crises such as depleting oil supplies, Ehren Helmut Pflugfelder turns specifically to automobility, a term used to describe the kinds of mobility afforded by autonomous, automobile-based movement technologies and their ramifications. Thus far, few studies in technical communication have explored the development of mobility technologies, the immense power that highly structured, environmentally significant systems have in the world, or the human-machine interactions that take place in such activities. Applying kinaesthetic rhetoric, a rhetoric that is sensitive to and developed from the mobile, material context of these technologies, Pflugfelder looks at transportation projects such as electric taxi cabs from the turn of the century to modern day, open-source vehicle projects, and a large case study of an autonomous, electric pod car network that ultimately failed. Kinaesthetic rhetoric illuminates how mobility technologies have always been persuasive wherever and whenever linguistic symbol systems and material interactions enroll us, often unconsciously, into regimes of movement and ways of experiencing the world. As Pflugfelder shows, mobility technologies involve networks of sustained arguments that are as durable as the bonds between the actors in their networks.

This book presents a comprehensive coverage of the five fundamental yet intertwined pillars paving the road towards the future of connected autonomous electric vehicles and smart cities. The connectivity pillar covers all the latest advancements and various technologies on vehicle-to-everything (V2X) communications/networking and vehicular cloud computing, with special emphasis on their role towards vehicle autonomy and smart cities applications. On the other hand, the autonomy track focuses on the different efforts to improve vehicle spatiotemporal perception of its surroundings using multiple sensors and different perception technologies. Since most of CAVs are expected to run on electric power, studies on their electrification technologies, satisfaction of their charging demands, interactions with the grid, and the reliance of these components on their connectivity and autonomy, is the third pillar that this book covers. On the smart services side, the book highlights the game-changing roles CAV will play in future mobility services and intelligent transportation systems. The book also details the ground-breaking directions exploiting CAVs in broad spectrum of smart cities applications. Example of such revolutionary applications are autonomous mobility on-demand services with integration to public transit, smart homes, and buildings. The fifth and final pillar involves the illustration of security mechanisms, innovative business models, market opportunities, and societal/economic impacts resulting from the soon-to-be-deployed CAVs. This book contains an archival collection of top quality, cutting-edge and multidisciplinary research on connected autonomous electric vehicles and smart cities. The book is an authoritative reference for smart city decision makers, automotive manufacturers, utility operators, smart-mobility service providers, telecom operators, communications engineers, power engineers, vehicle charging providers, university professors, researchers, and students who would like to learn more about the advances in CAEVs connectivity, autonomy, electrification, security, and integration into smart cities and intelligent transportation systems.

The automotive industry appears close to substantial change engendered by “self-driving” technologies. This technology offers the possibility of significant benefits to social welfare—saving lives; reducing crashes, congestion, fuel consumption, and pollution; increasing mobility for the disabled; and ultimately improving land use. This report is intended as a guide for state and federal policymakers on the many issues that this technology raises.

Massive employment growth at the Tahoe Reno Industrial Center (TRIC), with housing stock primarily in the Reno/Sparks area – and a constrained transportation corridor (I-80) connecting the two – is leading to significant congestion with the potential to slow desired economic development in the region. In addition to other strategies under consideration by the Nevada Department of Transportation (NDOT), such as shared mobility systems or widening of I80 to accommodate existing and future commuter traffic, the objective of this study was to determine the potential ridership and design standard requirements of a dedicated AV facility (potentially a single lane or one lane in each direction with consideration of one-lane bridges as a cost savings measure) that would reduce construction costs by inhibiting heavy-duty truck or bus usage. The AV-only roadway is anticipated to incorporate technology from both AV and connected vehicle (CV) roadside technology to support optimized use, vehicle platooning and lane management functions. The following AV Feasibility Study Framework was developed by the research team to allow NDOT to apply the same decision-making framework not only to this study, but also to any future AV roadway studies: (1) Identify Potential AV Developer Partners; (2) Review AV Developer Product Roadmap; (3) Identify Mutually Beneficial Use Cases; (4) Determine Physical and Intelligent Transportation System Infrastructure Needs; (5) Identify Suitable Nevada Corridor; and (6) Estimate Benefits of Use Cases. Extensive outreach to potential users revealed a strong preference to test AVs on roads shared with non-AVs – a more practical and immediate application of technology. NDOT will continue to promote advanced transportation technology solutions, and armed with the findings documented in this final report, has a better understanding of how to do so.

Experimenting with technology has always contributed immensely to interesting inventions in the field of automation. With the increasing population, the demands associated to transportation needs also increase, the reason why the Transportation Engineers and the respective industries have begun to develop and implement new and innovative ways to help increase the carrying capacities of roads, decrease traffic congestion and vehicle collisions. To help stabilize this impact on the transportation system, the design and development of connected and autonomous vehicles is marking its place in the existence to combat effective traffic management. Automated Vehicle (AV) inventory proves to have fourfold impacts on the traffic flow theory. The traffic flow theory as such comprises of parameters highly influencing the way the A.V. technology is expected to work its best on the local roads. Experiments have begun as early as 1920s implementing different levels of automation with promising trails taking place simultaneously but it was during late 1980s where the first self-sufficient and truly fully autonomous car appeared on the road. The implementation of autonomous vehicle technology is used in different aspects of traffic and transportation engineering to study and deal with specific outcomes to advance the research on this technology further into complete practical application. Intersections where traffic from the minor street entering the major has always been a serious cause of congestion, queue, delays and safety concern. In this research, it is specifically studied and analyzed, the major difference an intersection can experience by including autonomous vehicles in the flow that prove to provide more gaps for the merging traffic from the minor street with absolutely zero interference to the existing traffic flow, maintaining higher safety throughout the operation. The A.V.'s were introduced in the major street as different percentages to study the increasing gaps created for the traffic in the minor as such. Besides explaining the theoretical approach to the application of this scenario, the described intersection was built as a model in VISSIM simulation software where programming part was done using VISSIM's API (Application programming interface) using the C++ Visual Studio and a connection to the VISSIM was accomplished through the C2X application that has its coding done in Python Script. The C2X is the application that enabled to control the speed and position of the A.V.'s so the logic could be built and studied. The simulation in VISSIM was run and the results showed improved delay time and queue length. The exact scenario was modelled in Synchro 5, a traffic simulation software, to study the percentage changes in the capacity and control delay. To summarize, there was a great improvement for the intersection study with the inclusion of A. V's for the betterment of effective traffic management. However, further research is always recommended to study and apply similar logics to model multiple intersections to enhance implementation.

Once a feature from science-fiction movies and books, self-driving cars are now a reality on public roads throughout the United States. I argue that until extensive data and research on self-driving cars is made available to the public, a flexible, place-based framework should drive local development of autonomous vehicles. Through existing literature, I highlight how autonomous vehicles will create different benefits and costs in safety, energy use/emissions, employment, congestion, and the built environment. However, variation in spatial patterns will lead to different outcomes with self-driving cars across urban, suburban, and rural areas in the United States. I created a flexible local policy framework to analyze case studies in King County, Washington through demographic, geographic, and transportation data. These case studies are representative of urban, suburban, and rural areas throughout the county. Furthermore, I conclude that spatial variability in each community will influence how policy and planning shape the path for autonomous vehicle development. Through analyzing the fundamental differences between demographics, geography, and transportation behaviors in each study area, I conclude that local policymakers and planners should account for spatial variability when crafting tools to manage autonomous vehicle development in each neighborhood.

Autonomous Vehicle TechnologyA Guide for PolicymakersRand Corporation

This paper collection is the second volume of the LNMOB series on Road Vehicle Automation. The book contains a comprehensive review of current technical, socio-economic, and legal perspectives written by experts coming from public authorities, companies and universities in the U.S., Europe and Japan. It originates from the Automated Vehicle Symposium 2014, which was jointly organized by the Association for Unmanned Vehicle Systems International (AUVSI) and the Transportation Research Board (TRB) in Burlingame, CA, in July 2014. The contributions discuss the challenges arising from the integration of highly automated and self-driving vehicles into the transportation system, with a focus on human factors and different deployment scenarios. This book is an indispensable source of information for academic researchers, industrial engineers, and policy makers interested in the topic of road vehicle automation.

"A Vision for Safety replaces the Federal Automated Vehicle Policy released in 2016. This updated policy framework offers a path forward for the safe deployment of automated vehicles by: encouraging new entrants and ideas that deliver safer vehicles; making Department regulatory processes more nimble to help match the pace of private sector innovation; and supporting industry innovation and encouraging open communication with the public and with stakeholders."--Introductory message.

The technology and engineering behind autonomous driving is advancing at pace. This book presents the latest technical advances and the economic, environmental and social impact driverless cars will have on individuals and the automotive industry.

How safe should highly automated vehicles (HAVs) be before they are allowed on the roads for consumer use? In this report, RAND researchers use the RAND Model of Automated Vehicle Safety to compare road fatalities over time under a policy that allows HAVs to be deployed when their safety performance is just moderately better than human drivers and a policy that waits to deploy HAVs only once their performance is nearly perfect.

Who will win the race to develop the autonomous vehicle? Making predictions about technology, particularly technology as revolutionary as the autonomous vehicle, can be challenging. The Future is Autonomous: The U.S. and China Race to Develop the Driverless Car explores a number of key factors that will decide who will emerge victorious. In this book you will learn about: The major technological difficulties that must be overcome for a self-driving car to drive safely. The innovative companies that are creating new business models to commercialize autonomous vehicles. The political hurdles that both the U.S. and China must face to establish a common set of standards for autonomous vehicles both domestically and globally. And so much more! This book is a must read for anyone interested in the future of the automotive industry, cutting-edge technology, and keen political analysis. There is little doubt that whoever wins the race to develop the autonomous vehicle will have substantial influence in the industry for decades. No matter

which superpower comes out on top, the biggest winner of all will be the consumer.

In Three Revolutions, transportation expert Dan Sperling and his collaborators share research-based insights on potential public benefits and impacts of the three transportation revolutions of vehicle automation, shared mobility, and vehicle electrification. They describe innovative ideas and partnerships, and explore the role government policy can play in steering the new transportation paradigm toward the public interest--toward our dream scenario of social equity, environmental sustainability, and urban livability. Three Revolutions offers policy recommendations and provides insight and knowledge that could lead to wiser choices by all. With this book, Sperling and his collaborators hope to steer these revolutions toward the public interest and a better quality of life for everyone.

The Autonomous Vehicle (AV) has been strongly heralded as the most exciting innovation in automobility for decades. Autonomous Vehicles are no longer an innovation of the future (seen only in science fiction) but are now being road-tested for use. And yet while the technical and economic success and possibilities of the AV have been widely debated, there has been a notable lack of discussion around the social, behavioural, and environmental implications. This book is the first to address these issues and to deeply consider the environmental and social sustainability outlook for the AV and how it will impact on communities. Environmental and social sustainability are goals unlike those of technical development (a new tool) and economic development (a new investment). The goal of sustainability is development of societies that live well and equitably within their ecological limits. Is it reasonable and desirable that only technical and economic success comprise the swelling AV parade, or should we be looking at the wider impacts on personal well-being, wider society, and the environment? The uptake for AVs looks to be lengthy, disjointed, and episodic, in large measure because it faces a range of known unknown risks. This book assesses the environmental and social sustainability potential for AVs based on their prospective energy use and their impacts on climate change, urban landscapes, public health, mobility inequalities, and individual and social well-being. It examines public attitudes about AV use and its risk of fostering a rebound effect that compromises potential sustainability gains. The book concludes with a discussion of critical issues involved in sustainable AV diffusion.

This edited book comprises papers about the impacts, benefits and challenges of connected and automated cars. It is the third volume of the LNMOB series dealing with Road Vehicle Automation. The book comprises contributions from researchers, industry practitioners and policy makers, covering perspectives from the U.S., Europe and Japan. It is based on the Automated Vehicles Symposium 2015 which was jointly organized by the Association of Unmanned Vehicle Systems International (AUVSI) and the Transportation Research Board (TRB) in Ann Arbor, Michigan, in July 2015. The topical spectrum includes, but is not limited to, public sector activities, human factors, ethical and business aspects, energy and technological perspectives, vehicle systems and transportation infrastructure. This book is an indispensable source of information for academic researchers, industrial engineers and policy makers interested in the topic of road vehicle automation.

Autonomous Vehicles and Future Mobility presents novel methods for examining the long-term effects on individuals, society, and on the environment for a wide range of forthcoming transport scenarios, such as self-driving vehicles, workplace mobility plans, demand responsive transport analysis, mobility as a service, multi-source transport data provision, and door-to-door mobility. With the development and realization of new mobility options comes change in long-term travel behavior and transport policy. This book addresses these impacts, considering such key areas as the attitude of users towards new services, the consequences of introducing new mobility forms, the impacts of changing work related trips, and more. By examining and contextualizing innovative transport solutions in this rapidly evolving field, the book provides insights into the current implementation of these potentially sustainable solutions. It will serve as a resource of general guidelines and best practices for researchers, professionals and policymakers. Covers hot topics, including travel behavior change, autonomous vehicle impacts, intelligent solutions, mobility planning, mobility as a service, sustainable solutions, and more Examines up-to-date models and applications using novel technologies Contains contributions from leading scholars around the globe Includes case studies with the latest research results

This report presents a framework for measuring safety in automated vehicles (AVs): how to define safety for AVs, how to measure safety for AVs, and how to communicate what is learned or understood about AVs.

Autonomous Vehicles: Technologies, Regulations, and Societal Impacts explores both the autonomous driving concepts and the key hardware and software enablers, Artificial intelligence tools, needed infrastructure, communication protocols, and interaction with non-autonomous vehicles. It analyses the impacts of autonomous driving using a scenario-based approach to quantify the effects on the overall economy and affected sectors. The book assess from a qualitative and quantitative approach, the future of autonomous driving, and the main drivers, challenges, and barriers. The book investigates whether individuals are ready to use advanced automated driving vehicles technology, and to what extent we as a society are prepared to accept highly automated vehicles on the road. Building on the technologies, opportunities, strengths, threats, and weaknesses, Autonomous Vehicles: Technologies, Regulations, and Societal Impacts discusses the needed frameworks for automated vehicles to move inside and around cities. The book concludes with a discussion on what in applications comes next, outlining the future research needs. Broad, interdisciplinary and systematic coverage of the key issues in autonomous driving and vehicles Examines technological impact on society, governance, and the economy as a whole Includes foundational topical coverage, case studies, objectives, and glossary

Autonomous vehicle (AV) technology represents a possible paradigm shift in our way of life. But complex challenges and obstacles impose a reality at odds with the utopian

visions propounded by AV enthusiasts in the private and public sectors. The new volume in the Urban Agenda series examines the technological questions still surrounding autonomous vehicles and the uncertain societal and legislative impact of widespread AV adoption. Assessing both short- and long-term concerns, the authors probe how autonomous vehicles might change transportation but also land use, energy consumption, mass transit, commuter habits, traffic safety, job markets, the freight industry, and supply chains. At the same time, the essays discuss opportunities for industry, researchers, and policymakers to make the autonomous future safer, more efficient, and more mobile. Contributors: Austin Brown, Stan Caldwell, Chris Hendrickson, Kazuya Kawamura, Taylor Long, and P. S. Srira.

Better public policies can make the road smoother for self-driving vehicles and the society that soon will depend on them. Whether you find the idea of autonomous vehicles to be exciting or frightening, the truth is that they will soon become a significant everyday presence on streets and highways—not just a novel experiment attracting attention or giggles and sparking fears of runaway self-driving cars. The emergence of these vehicles represents a watershed moment in the history of transportation. If properly encouraged, this innovation promises not only to vastly improve road travel and generate huge benefits to travelers and businesses, but to also benefit the entire economy by reducing congestion and virtually eliminating vehicle accidents. The impacts of autonomous vehicles on land use, employment, and public finance are likely to be mixed. But widely assumed negative effects are generally overstated because they ignore plausible adjustments by the public and policymakers that could ameliorate them. This book by two transportation experts argues that policy analysts can play an important and constructive role in identifying and analyzing important policy issues and necessary steps to ease the advent of autonomous vehicles. Among the actions that governments must take are creating a framework for vehicle testing, making appropriate investments in the technology of highway networks to facilitate communication involving autonomous vehicles, and reforming pricing and investment policies to enable operation of autonomous vehicles to be safe and efficient. The authors argue that policymakers at all levels of government must address these and other issues sooner rather than later. Prompt and effective actions outlined in this book are necessary to ensure that autonomous vehicles will be safe and efficient when the public begins to adopt them as replacements for current vehicles.

This book combines comprehensive multi-angle discussions on fully connected and automated vehicle highway implementation. It covers the current progress of the works towards autonomous vehicle highway development, which encompasses the discussion on the technical, social, and policy as well as security aspects of Connected and Autonomous Vehicles (CAV) topics. This, in return, will be beneficial to a vast amount of readers who are interested in the topics of CAV, Automated Highway and Smart City, among many others. Topics include, but are not limited to, Autonomous Vehicle in the Smart City, Automated Highway, Smart-Cities Transportation, Mobility as a Service, Intelligent Transportation Systems, Data Management of Connected and Autonomous Vehicle, Autonomous Trucks, and Autonomous Freight Transportation. Brings together contributions discussing the latest research in full automated highway implementation; Discusses topics such as autonomous vehicles, intelligent transportation systems, and smart highways; Features contributions from researchers, academics, and professionals from a broad perspective.

The HCM 2010 significantly enhances how engineers and planners assess the traffic and environmental effects of highway projects by: Providing an integrated multimodal approach to the analysis and evaluation of urban streets from the points of view of automobile drivers, transit passengers, bicyclists, and pedestrians; Addressing the proper application of microsimulation analysis and the evaluation of the results; Examining active traffic management in relation to demand and capacity; and Exploring specific tools and generalized service volume tables to assist planners in quickly sizing future facilities. The four-volume format provides information at several levels of detail, to help users more easily apply and understand the concepts, methodologies, and potential applications.

This edited volume, Autonomous Vehicles, is a collection of reviewed and relevant research chapters, offering a comprehensive overview of recent developments in the field of vehicle autonomy. The book comprises nine chapters authored by various researchers and edited by an expert active in the field of study. All chapters are complete in itself but united under a common research study topic. This publication aims to provide a thorough overview of the latest research efforts by international authors, open new possible research paths for further novel developments, and to inspire the younger generations into pursuing relevant academic studies and professional careers within the autonomous vehicle field.

Take a look at the vehicle sitting in your driveway. It may be the last one you ever own. With an estimated 33 million fully autonomous cars and taxis projected to hit the road by 2040, an automotive renaissance is soon to be upon us. Personal car ownership currently costs the average medium-sized sedan owner $9,282 annually. But personal car ownership may soon be a thing of the past. The A.I.-powered machines of the future will be doing the driving for us. Autonomous vehicles will be the most disruptive technology ever deployed by mankind.

The book "Recent Developments in Optoelectronic Devices" is about the latest developments in optoelectronics. This book is divided into three categories: light emitting devices, sensors, and light harvesters. This book also discusses the theoretical aspects of device design for iridium complexes as organic light emitting diodes (OLEDs), strategies for developing novel nanostructured materials, silicon-rich oxide (SRO) electroluminescent devices, and multifunctional optoelectronic devices developed on resistive switching effects. The worldwide participation of authors has contributed to the unifying effect of science. Furthermore, interested readers will also find information on the screen printed technology using semiconductor devices, nonlinear phenomena in quantum devices, experimental set up of optoelectronics flexible logic gate to realize logic operations, autonomous vehicles, and the latest developments in perovskites as solar cells.

Recent technological advances have made feasible new and improved approaches for organizing and delivering local passenger transportation. This book draws on a selection of papers presented at the International Paratransit Conference in Monterey in October 2014 to capture these exciting developments.

In New Mobilities: Smart Planning for Emerging Transportation Technologies, transportation expert Todd Litman examines 12 emerging transportation modes and services that are likely to significantly affect our lives: bike- and carsharing, micro-mobilities, ridehailing and micro-transit, public transit innovations, telework, autonomous and electric vehicles, air taxis, mobility prioritization, and logistics management. Public policies around New Mobilities can either help create heaven, a well-planned transportation system that uses new technologies intelligently, or hell, a poorly planned transportation system that is overwhelmed by conflicting and costly, unhealthy, and inequitable modes. His expert analysis will help planners, local policymakers, and concerned citizens to make informed choices about the New Mobility revolution.

This book collects into a single, edited volume the accumulating body of thinking and research on driver and operator acceptance of new technology. Bringing together contributions from international experts from around the world, the editors have shaped a book that covers the theory behind acceptance, how it can be measured and how it can be improved. Case studies are presented that provide data on driver acceptance of a wide range of new and emerging vehicle technology.

Mobility - flows, movement and migration in social life - has emerged as a central area of sociological debate, yet one of its most dominant forms, automobility, has remained largely ignored. Automobilities presents one of the first examinations of the car and its promise of autonomy and mobility.

Collaboration is an important aspect of many successful natural systems, but it is rare to find in transportation systems. However, recent advances in the standardization of communication technologies, improvements in unmanned aerial systems, and deployments of large autonomous vehicle fleets could be used to collaboratively optimize entire traffic networks and improve the safety of self-driving cars. This thesis considers how unmanned aerial systems could use communication to provide useful information to self-driving cars and transportation systems. A custom unmanned aerial system is designed and built to study dedicated short-range communication (DSRC) technology. The physical layer of DSRC is studied extensively using the unmanned aerial system and concerns are given for antenna design. Then a simulation environment is built to study large scale implementation of communication and unmanned aerial systems in traffic networks. This simulation environment is shown to be useful for a wide array of traffic studies. Finally, considerations are given for future work.

While many transportation and city planners, researchers, students, practitioners, and political leaders are familiar with the technical nature and promise of vehicle automation, consensus is not yet often seen on the impact that will result, or the policies and actions that those responsible for transportation systems should take. The End of Driving: Transportation Systems and Public Policy Planning for Autonomous Vehicles explores both the potential of vehicle automation technology and the barriers it faces when considering coherent urban deployment. The book evaluates the case for deliberate development of automated public transportation and mobility-as-a-service as paths towards sustainable mobility, describing critical approaches to the planning and management of vehicle automation technology. It serves as a reference for understanding the full life cycle of the multi-year transportation systems planning processes, including novel regulation, planning, and acquisition tools for regional transportation. Application-oriented, research-based, and solution-oriented rather than predict-and-warn, The End of Driving concludes with a detailed discussion of the systems design needed for accomplishing this shift. From the Foreword by Susan Shaheen: The authors ... extend potential solutions through a set of open-ended exercises after each chapter. Their approach is both strategic and deliberate. They lead the reader from definitions and context setting to the transition toward automation, employing a range of creative strategies and policies. While our quest to understand how to deploy automated vehicles is just beginning, this book provides a thoughtful introduction to inform this evolution. Offers a workable public transit solution design melding the traditional “acquire-and-operate mode with the absorption of new technology Provides a step-by-step discussion of digital systems designs and effective regulation-by-data approaches needed for a new urban mobility Learning aids include case study scenarios, chapter objectives and discussion questions, sidebars and a glossary

Autonomous vehicles have the potential to bring major improvements in highway safety. Motor vehicle crashes caused an estimated 36,560 fatalities in 2018; a study by the National Highway Traffic Safety Administration (NHTSA) has shown that 94% of crashes are due to human errors. For this and other reasons, federal oversight of the testing and deployment of autonomous vehicles has been of considerable interest to Congress. In the 115th Congress, autonomous vehicle legislation passed the House as H.R. 3388, the SELF DRIVE Act, and a separate bill, S. 1885, the AV START Act, was reported from a Senate committee. Neither bill was enacted. In the 116th Congress, interest in autonomous vehicles remains strong, but similar comprehensive legislative proposals have not been introduced. The America's Transportation Infrastructure Act of 2019, S. 2302, which has been reported by the Senate Environment and Public Works Committee, would encourage research and development of infrastructure that could accommodate new technologies such as autonomous vehicles. In recent years, private and government testing of autonomous vehicles has increased significantly, although it is likely that widespread use of fully autonomous vehicles-where no driver attention is needed-may be many years in the future. The pace of autonomous vehicle commercialization may have slowed due to the 2018 death in Arizona of a pedestrian struck by an autonomous vehicle, which highlighted the challenges of duplicating human decision making by artificial intelligence. The National Transportation Safety Board determined that the fatality was caused by an "inadequate safety culture" at Uber- which was testing the vehicle-and deficiencies in state and federal regulation. The U.S. Department of Transportation and NHTSA have issued three reports since 2016 that inform the discussion of federal autonomous vehicle policies, suggesting best practices that states should consider in driver regulation; a set of voluntary, publicly available self-assessments by automakers showing how they are building safety into their vehicles; and a proposal to modify the current system of granting exemptions from federal safety standards. On February 6, 2020, NHTSA announced its approval of the first autonomous vehicle exemption-from three federal motor vehicle standards-to Nuro, a California-based company that plans to deliver packages with a robotic vehicle smaller than a typical car. Proponents of autonomous vehicles contend that lengthy revisions to current safety regulations could impede innovation, as the rules could be obsolete by the time they took effect. Federal and state regulatory agencies are addressing vehicle and motorist standards, while Congress is considering legislative solutions to some of the regulatory challenges.