

## AUTONOMOUS, ELECTRIC, ON-DEMAND VEHICLES

### “NEED TO KNOW” POLICY CONSIDERATIONS ABOUT THE FUTURE OF TRANSPORTATION

In *Rethinking Transportation 2020-2030*, RethinkX provides a detailed analysis of the convergence of autonomous vehicles, electric vehicles and ride-hailing platforms. The resulting business model, transport-as-a-service (TaaS), has the potential to greatly change the transportation landscape, ending individual vehicle ownership and reshaping the world’s energy economy. It offers cities new choices and a “second pass” on earlier ones.

### What are the benefits?

A transition to autonomous, electric vehicles (A-EVs) fleets providing TaaS will increase mobility, cut traffic accidents and deaths and will result in far more efficient use of vehicles and roads, freeing up congestion and enormous space in cities.

RethinkX analysis shows that A-EV fleets providing on-demand transport will have ten-times-higher vehicle utilization rates than current vehicles, 500,000-mile vehicle lifetimes and far lower maintenance, energy, finance and insurance costs.

This will result in transportation at a fraction of today’s price, driving rapid consumer adoption.

#### WITHIN 10 YEARS OF THE REGULATORY APPROVAL OF DRIVERLESS VEHICLES



TaaS will be an irresistible 4 to 10× cheaper than the current individual-ownership model



As a result, adoption will be rapid: 95% of US passenger miles traveled will be by TaaS



With a shift to ride-sharing, fewer cars will travel more miles. The number of passenger vehicles on American roads could drop from 247 million in 2020 to 44 million in 2030

#### » OPPORTUNITIES

- Dramatic drop in transportation costs, saving each U.S. household \$5,600 per year, or \$1 trillion in aggregate per year
- Potential GDP boost of additional \$1 trillion from increased productivity from time savings
- Near-universal access to mobility across all demographics, including those excluded today
- Ability to repurpose vast tracts of land in cities due to diminishing vehicle & parking needs
- The creation of new industries and business opportunities
- Reduction in energy demand by 80% and tailpipe emissions by over 90%, reducing pollution, improving public health and saving lives

#### » CHALLENGES TO PLAN FOR

- Substantial job losses in conventional energy and transportation industries
- 70% drop in number of passenger cars and trucks manufactured each year, impacting car dealers, maintenance and insurance companies
- A peak in oil demand in 2020, prompting a price collapse to around \$25 per barrel

An anticipatory policy structure can help usher in a new era of affordable personal mobility, while mitigating the impacts of a transition away from established value chains.

The following considerations can help guide policymakers in this disruption.

#### PRIORITY CONSIDERATIONS

» ***Fast-track technology and testing, and remove barriers***

Support pilots, trials and testing. The more A-EVs on the road, the faster the industry can progress. Lack of support risks ceding the lead in this market (jobs and future tech) to China. Address uncertainties on liability, insurance, cyber-security, testing and permitting to harmonize at the highest level.

» ***Encourage competition, interoperability, open data, and fair user fees***

Encourage interoperability, open data and open programming interfaces and standards. This will increase competition amongst transportation service providers and enable innovators and entrepreneurs to develop new products, applications and business models that will create new jobs and further decrease the cost of transportation. Open standards could, for instance, allow AVs from different providers to “talk” to one another or the built infrastructure such as traffic lights or the grid. The data infrastructure underpinning shared transport services must enable interoperability, competition and innovation, while delivering privacy, security, and accountability and paying fair share for road use, congestion, pollution, and curb use.

» ***Plan for job changes***

TaaS will bring new opportunities but also job losses to mitigate through investment, retraining, and income support to keep the workforce and household incomes healthy as people transition to new jobs and industries.

» ***Work across party lines to build support for TaaS***

A-EVs are apolitical, offering a massive economic boost and health and environmental benefits for every household.

#### PLANNING CONSIDERATIONS

» ***Accelerate adoption to get mass benefits***

Achieving the maximum benefit of AVs require whole-system adoption and ridesharing for efficiencies. Clear, standardized rules are needed to clarify accident liabilities, requirements and testing frameworks, and liability related to cyber-security breaches. Designated curb-side drop off and AV-only lanes would also speed adoption.

» ***Promptly tackle transit planning***

TaaS vehicles can and should work with other forms of public transportation such as buses, biking and walking. Infrastructure planning should incorporate and encourage all forms in a holistic approach.

» ***Address potential congestion problems with lower cost transportation***

During the transition to TaaS, policies to increase vehicle occupancy and manage curb use will be necessary to reduce the higher demand that accompanies lower cost. Interoperable vehicles in fleets, operated for ridesharing, are key. Discouraging subsidized parking would help increase vehicle throughput.

» ***Require data interoperability and shared-ride fleets***

The data infrastructure for shared transport services must be sufficiently open to enable interoperability, competition and innovation, while delivering privacy, security, and accountability. Requiring insulated data-sharing and shared fleets will maximize learning per vehicle and thus increase safety, while ensuring that vehicle maintenance and software upgrades are monitored and managed by professionals, that autonomous travel is available to all, and will help address early/limited supply issues. This will maximize the efficiency of vehicles and roads and minimize undue costs for the public sector.

» ***Develop ubiquitous integrated connectivity for seamless travel***

Encourage all transportation services to be integrated and coordinated across vehicles, modes, operators, and geographies. This depends upon ubiquitous wireless access and entails thoughtful system planning, physical connections, a single fare payment structure, and combined mobility information.

» ***Replace revenues with fair share for road and curb use, congestion, and pollution***

Lost government revenues from vehicle ownership and parking must be replaced. Revenues should be based on vehicle miles not passenger miles. This will encourage shared riding and discourage “deadhead”/empty vehicle travel.

» ***Provide tangible signals: Incorporate TaaS into infrastructure and urban planning***

Begin planning for the transport modes, uses, and public users of the future. Considerations include the curb space TaaS will need, repurposing parking and road space, and readying for TaaS in peripheral areas. Re-examine parking requirements, policies for curb-space, HOV/shared E-AV-only lanes, and road striping policies. For instance, transportation planners should encourage higher vehicle utilization (vehicles that drive more miles each day and rarely use parking infrastructure) rather than higher occupancy in low utilization vehicles (vehicles that are parked most of the day). HOV lanes should be opened to A-EVs.

» ***Plan for cities and mobility together. Engage the public in a supportive, listening space***

To demonstrate the benefits of TaaS and the positive changes it can bring, invest in public education and opportunities to co-design nodes, pick-up spaces and other community improvements. Be deliberate in planning for sprawl or density and ensure planning for cities and mobility are undertaken together.

