

THE CHALLENGE

Fully autonomous vehicles (AVs) are becoming a reality at an unanticipated and accelerated pace. In addition to saving lives, reducing injuries, and providing accessible affordable access to opportunity, **AVs are the tip of the spear for bringing about actionable change in other things we care about: addressing climate change and income inequality, transforming the quality and livability of cities and the rural poor, and forging a new contract with labor.**

Compelling economics on both supply and demand side will mean that, once available, AVs will likely be widely adopted in major OECD cities within five years by 2025, where they can be intensively and safely used. Some sources for this:

- Deloitte's [analysis](#) suggests “these changes could occur more quickly and at greater scale than many are prepared for, especially in densely populated areas. If shared and autonomous vehicles are adopted as quickly as other technologies (like smartphones, cellphones, and the Internet), our modeling finds that significant change will begin within five years and that the market for personal mobility could transform dramatically over the next 25 years”
- Goldman Sachs **predicts** North American auto sales could be almost 60 percent autonomous by 2030
- Ford plans to begin mass-production of a [fully driverless car by 2021](#), CEO Mark Fields notes”this next decade is really going to be defined by the automation of the automobile.”
- Tesla CEO, Elon Musk: “In 7 to 8 years, fifty percent of cars sold will be autonomous.
- Lyft President, John Zimmer: “By 2025, private car ownership will all-but end in major U.S. cities.”

Cities in emerging markets will follow with perhaps a five year lag. Outside of metro areas, the trucking industry and intercity travel will find particular origin-destination pairs in which AVs will be both safe and economically appealing.

This convergence of digital technology and the transportation industry will be one of the most sophisticated and disruptive changes to occur during the rest of this decade, and it's vital, whatever the predictions regarding its pace, that government and communities are engaged in what is happening. Right now there is a huge information asymmetry between the private and public/people sectors. Without better information now, cities will find themselves overwhelmed by events and less able or unable to make the most public good of this shift. A poorly managed transition to AVs will negatively define the economics, outlook, and quality of life for most people, particularly those living in urban areas. A proactive transition gives us a rare opportunity to attend to challenges critical to every country's success.

Quickly described below are the “heaven or hell” scenarios (and a [4 minute animation](#)). In all cases, AVs will significantly reduce traffic deaths and serious injuries. Worldwide there are 1.2 million traffic deaths and one hundred times that number of serious injuries. Currently air pollution from combustion vehicles is killing even more. We have the opportunity to deal with all of these problems at one time. AVs will

also transform access to jobs – high quality, low cost transportation has been shown to be the key to getting people out of poverty -- and will give independence to the young as well as the old and disabled.

Letting this transition unfold on the back burner is likely to deliver “hell” by default. By removing drivers, AVs facilitate an explosion of newly economical use cases for vehicles. Following today’s status quo ownership models, dirty fossil-fuel burning personal cars are inexorably replaced by personal AVs (electric or not), with the shift being driven by commercial interests. The results:

- **dramatic increases in congestion:** without the cost of human time, low value car errands become economical and in dense metro areas it is cheaper to keep a car rolling than to pay for parking; commerce, retail, and goods warehousing on wheels will move to the streets.
- **huge deficits in our already inadequate transportation infrastructure finances:** AVs would rarely park, speed, or incur other fines, and higher occupancy vehicles resulting from shared trips mean fewer vehicles to toll. Electric autonomous vehicles would pay no fuel taxes under current systems. Connected vehicles offer the opportunity to change taxation but the political will must be there and how we design these new taxes will dictate incentives/disincentives for use.
- **rapid and significant job losses** leading to suffering and economic unrest. The numbers can quickly amount to millions of jobs lost: taxi (90k registered with the Taxi & Licensing Commission in New York), bus (665k) and truck drivers (3.5 million); maintenance and repair, insurance; and jobs reliant on these ecosystems. In specific geographies (cities, manufacturing towns) and for specific demographics (urban taxi drivers are primarily first generation immigrants with low language skills, inter-city trucking is high school education white men) these losses will be felt acutely. The best-case scenario (described below) would actually increase short-term job loss to include those employed in the manufacturing (5.5 million people) and sale of vehicles (1.65 million dealership workers). This disruption will unfold quickly due to compelling supply- and demand-side economics, the relatively low capital cost per unit permitting rapid uptake, and no new infrastructure requirements.
- **unnecessary traffic deaths and injuries** from a slowed-down introduction.

Three revolutions are happening right now in the transport sector -- electric, shared, autonomous. Work towards adoption of electric and shared are important and will minimize the effort required for where we want to end up: autonomous vehicles that are *electric and shared*. **A proactive approach to the AV transition offers an unparalleled opportunity for a ‘do-over’ of our cities and transportation networks, as well as address many other larger societal problems. In this future, personal cars are replaced in cities (and perhaps everywhere) with FAVES (Fleets of AVs that are Electric and Shared) :**

- **Fix transportation taxes for this new vehicle category** (which will rapidly replace existing internal combustion engine vehicles), based on distance, congestion, weight, fuel type.
- **Transform city livability:** an [OECD report](#) shows that we will only need 3-10% of the vehicles we have today if we share trips within shared vehicles, enabling us to...
- **Extract much greater community and commercial value from existing streets and parking garages,** toward more safe, livable, and enjoyable community space, with positive effects on adjacent land uses and values.

- Create more compact residential areas through the elimination / downsizing of individual garages in new developments, potentially adding more dwelling units and allowing more people to age in place.
- **Deliver door-to-door transportation at the speed of a private vehicle and the cost of bus fare.** Household travel budgets would be reduced by as much as 75% (pay only for what you use, easy to share trips, electric cheaper to maintain, lower parking and insurance costs). The newly available disposable income could be spent more locally.
- **Increase access to opportunity:** the availability of quality [low cost transport](#) has been identified as the largest barrier to getting out of poverty.
- Rapidly **electrify our transport sector reducing CO2.** Instead of dealing with anxieties slowing electric vehicle uptake by consumers, fleets take care of the hassle and recognize the benefits of lower operating costs.
- **Create jobs by building renewable energy infrastructure** to meet the new incremental energy demand, as well as privatizing much labor that is now unpaid (cleaning and maintenance of personal cars).
- **Refresh the social contract with labor** and our increasingly independent workforce, to protect them in an era of automation.

Companies within the ecosystem are creating lobbying organizations to work with countries and cities on safety, legal, and insurance issues. In the US, for example, Ford, Google, Volvo, Uber, and Lyft created the Self Driving Coalition for Safer Streets. But *who is looking out for the interest of cities and those who live and work in them? How do we take this impending transition and use it as an opportunity to create sustainable livable cities?*

THE SOLUTION

As Christiana Figueres, former head of the UNFCCC, notes: “The infrastructure we build over the next four years will determine the fate of humanity.” Fatih Birol and the International Energy Association already cautioned in 2011 that infrastructure and equipment that would take us past 2 C would be built by 2017. There is no time to waste. We need to seize this opportunity not just in the United States, not just in Europe, but worldwide, at scale, and responding as rapidly as we can.

OSMOSYS is a rapid response alliance of people, NGOs, institutions, cities, and the private sector working together and working through the introduction of autonomous vehicles into cities. Why Osmosys? Given the opportunity presented by this transition, we seek to create the conditions that continually pull cities towards a steady state that is livable, sustainable, and just.

Current civil society response to the impending introduction of AVs is either oblivious or siloed. Many more sectors and advocates need to be actively engaged in the fight for the good future we can have with FAVES or the missed opportunities will be devastating, not just disappointing. Indeed, we might prefer more simplicity and the success of straight-forward siloed responses, but those run the risk of being ineffective and missing the chance to create better public outcomes. The urgently needed response requires efforts in many sectors and is actionable by four distinct actors: (1) city and federal governments; (2) civil society representing the public interest in different sectors; (3) manufacturers/service providers; and (4) users/people.

SECTORS	GOALS
COMMUNITY	Demand FAVES not personal AVs or upgrades for the wealthy, reducing deaths and injuries from traffic collisions and poor air quality. Have vision of livable cities that includes environmental and social justice as well as concern about impacts on labor.
DATA	Protect privacy and address security. Develop standard Open APIs to support multimodal transport and shared trips. Create a data commons that enables better metrics for livability and investment.
TRANSPORT	Support and expand complete streets and physically active modes for 50% of trips (walk/bike). Promote shared, electric, and ultimately FAVES.
LAND USE	Repurpose ROW and parking for livable, equitable, sustainable communities. Create local criteria and priorities now.
LABOR	Build fund for inevitable driver job losses. Create job registry for new jobs; pilot UBI. Enable income diversification and protect this way of earning income.

TAXATION	New transport tax regime to shape incentives & cover costs. Model for labor automation, rethink labor & corporate taxation.
ENERGY & CLIMATE	Urban AVs must be use clean renewable energy. Incremental demand on electric grid must be renewable; municipalities, agencies must be part of push toward more rapid shift to clean electricity.

Change happens best with these conditions:

- **EDUCATION.** People understand the urgency for action and the alternative futures. They see themselves as important stakeholders in both the opportunities and challenges brought on by the advent of AVs;
- **PLATFORMS FOR PARTICIPATION.** Tools for engagement are available that empower local entities, simplify complex actions, and coordinate the smaller parts. These will include research, cultural, and policy platforms (see more detail below).
- **NETWORKS.** Professional networks and forum exist where stakeholders can engage in deep, on-going, thoughtful discussions (often outside the public view), connect with relevant expertise and those who are ahead on the learning curve.

For the four different stakeholders / groups of collaborators, we hope to provide each of them with the education, platforms, and networks to create the structures needed to push and pull cities (and residents, vehicle owners, and the private sector) toward a steady state that is livable, sustainable, and just.

TARGET COLLABORATORS	PLATFORMS FOR PARTICIPATION
Cities	<p>CLOSED NETWORK. Opportunity to discuss and think through these issues outside of the public realm with colleagues and experts.</p> <p>RESEARCH. Like ITF’s city algorithm for #AVs vs personal cars, create research platforms that can be cost-effectively localized to quantify: 1) new access to jobs; 2) inventory on-street and off-street parking and value potential for new uses; 3) actual driver & other job loss; 4) transport tax revenue loss (& labor tax loss).</p> <p>POLICY RECOMMENDATIONS & best practices</p>
NGOs	<p>CLOSED NETWORK. Opportunity to learn, think through, and discuss the issues that lie at the intersection of their sector and the “heaven” scenario, outside of the public realm with colleagues and experts within their city and to sector experts worldwide.</p>

	<p>ADVOCACY PLATFORM of policy recommendations (see above) and education/cultural platforms (see below).</p> <p>FINANCIAL RESOURCES in front-line cities where political and legislative climate indicates we should go deep.</p>
Public	<p>CULTURAL ASSETS. High quality shareable media (words, photos, videos, art) with visions of alternative future. Replicable performance art & traveling exhibits at local level.</p>
Private Sector Ecosystem	<p>CLOSED NETWORK to discuss and think through these issues outside of the public realm with colleagues and experts.</p> <p>EVENTS in which to participate, advocate, and support the 'Heaven' vision.</p>