

# Cars to generate MaaS' success:

## A case for Peer-to-Peer Ride Sharing

### The future of mobility

Mobility as a Service (MaaS) hinges upon market transparency and choice. Travelers use their smartphone (or some Artificial Intelligence) to explore how to get from A to B while respecting their individual criteria and constraints. Beyond navigation, MaaS enables the choice of transportation mode as well as the commitment/payment/ticketing process. Travel criteria and constraints can be a combination of factors, including:

- Travel time (incl congestion time, wait time, # of transfer points)
- Cost (per mile, per trip, per group)
- Accomodation/Special Needs (luggage, # transfers, stroller/wheelchair access)
- size / composition of group (e.g. traveling alone or with kids, special needs travelers)
- privacy and comfort options, and more.

[Ben's Journey](#), a short concept movie produced by Deloitte Insights, provides a good visualization of a daily commuter utilizing this concept.

Clearly, this new type of User Interface is what we expect and need for Self Driving Vehicles to be useful to the general public. However it is important to note that Autonomous Vehicles are not a requirement for this User Experience to emerge or be successful. This paper explores this concept at a high level and advocates for its active creation by its stakeholders rather than waiting and seeing what commercial players like Waymo, Uber and Lyft may offer us.

### What do we have today?

MaaS service elements emerge around us today with Lyft and Uber as the obvious examples for chauffeured cars. In Public Transportation we can see the same trends with Ventra as one of the most notable applications. [Ventra](#) is Chicago's Public Transportation Schedule & e-ticketing + Bike shares, developed by Cubic. Ventra is coming to NYC as well, however e-Ticketing will take several more years to be a reality in New York. For now the app integrates with Metro-card and existing payment capabilities. Other interesting MaaS apps popping up in international cities include [www.maas.global](http://www.maas.global) (Whim) and the Citymapper App.

Now today's reality in the USA is that most people, especially those not living in major urban areas, are dependent on privately owned cars to get around. The personally owned car's utility has been second to none and therefore, car ownership is baked into our culture and life expectations. Realistic, equally functional mobility options have not been available in the past. Public transportation is not an option for the majority of our transportation needs.

## Transportation Objectives

We have come to a crossroads however where new options are becoming realistic. More so, we need to embrace new options to continue to bring about everything we hold as desirable in transportation including:

- Safety of Travel: "Vision Zero" / eliminate (fatal) accidents
- Realistic controls to manage & eliminate congestion
- Controls to manage pollution & emissions
- Universal access to mobility for all travelers (in all neighborhoods)
- Harmony between alternate transportation modes (public transportation, cycling, cars)
- Reducing the cost per mile traveled
- Supports (emotional) lifestyle choices and allows identity to be present
- Leaves travelers free to choose from a greater range of options to satisfy their needs
- Solid financial underpinning for our public infrastructure needs
- Ability to engage private industry to invest in the realization of infrastructure elements

## Getting up to speed

While the Private Sector is charging ahead in various niches to create services and solutions, it is critical for our infrastructure that the Public Sector takes a leading role in the emergence of these capabilities for several reasons:

- We need oversight with regards to safety, privacy and interoperability of such services for them to be of maximum utility to the public and other stakeholders
- For the traveling public, the first priority is the ability to get to your destination. Secondary and tertiary criteria include the level of luxury and customization to their needs. Without a central guiding hand, interoperability is unlikely to emerge.
- The revenue base for the public infrastructure is at stake. Today's gas tax is insufficient as a funding mechanism for our roads. Going forward this funding situation will get worse given an increasing population of electric vehicles, scooters and other transportation modes, none of which contribute to the cost of infrastructure.
- We need to optimize the utilization of the infrastructure we have before investing in additional infrastructure. This can only be done through guidance by our public sector. The public sector needs access to aggregate, sound data to evaluate unmet needs, and determine direction for the creation of success criteria for private sector investment in our infrastructure.

Just to be clear, we are not advocating the Public Sector builds ANY piece of this. We are advocating that the public sector at its various levels guides the emergence of a transparent, efficient, safe set of mobility options which offer superb value to the general public and society.

## What can we do?

Here is how the Public Sector can create conditions for success to create this experience as an option for travelers:

- Public Sector invites and oversees a handful of players to provide the market making MaaS service for the nation. This could be done through a system of licensing. Providers commit to maintaining MaaS services which allow inclusion of specific travel capabilities (Ridehailing, Ridesharing, public transportation, bikes, scooters, etc), in certain localities while adhering to safety and transparency standards. These MaaS service providers provide the fabric for individual services to work together and create seamless experiences for travelers.
- Licensed MaaS service providers provide data sets allowing the Public Sector to better manage the Macro Transportation trends and possibly apply Road Pricing to incent productive behaviors (congestion pricing, parking / roadside pricing, vehicle miles traveled) and provide funds to maintain an efficient infrastructure.
- While MaaS trends are visible in Public Transportation and in certain private services today, **adding the base of personally owned vehicles to the MaaS system** will be the catalyst to get over the inflection point and make MaaS relevant / valuable to all citizens. Public Sector driven MaaS emergence will provide a learning space, controlled by the voters (rather than by the handful of companies developing the vehicles) to develop business models which are needed to make Autonomous Vehicles a successful trend in society.
- The technology to generate this new transportation model will drive investments and economic growth for participating parties whether providers or users. Technology is available and all that is needed is a policy framework for it to be put to use. Technology only now is at a level where all components are generally available to make this possible:
  - a. Ready access to inexpensive smartphones
  - b. 5G Wireless, IoT, AI, Cloud, Big Data technical capabilities
  - c. High precision GPS (1-3 cm accuracy)
  - d. Connected Vehicle technology (embedded and aftermarket)
  - e. Inexpensive, powerful enforcement capabilities including Video Image Recognition/License Plate Reading. In addition, technology allows us to create more effective, immediate channels to violators and encourage virtuous behaviors.
  - f. The ability to create invisible/wireless systems that require no gantries or obstruct traffic freeflow in any way. Systems can just live as an application within the already existing infrastructure.
- The Public Sector can use all its levers to contribute to MaaS' success. This includes rules governing parking, driving, congestion, emissions, taxation, mileage compensation, corporate compensation policies. Today's carpooling rules are outdated and restrictive.

## In summary

MaaS needs to provide peer to peer car sharing, (where a professional driver is not needed) in order to meet the general public transportation needs. The cost (~\$0.52 / mile) is shared among the travelers allows the public to reduce their cost per mile while increased seat occupancy reduces congestion, emissions and fuel use. A well conceived MaaS system allows society to generate all benefits listed while preserving choice for individuals to participate or not.

The technology supporting this system, is all available today, and can simultaneously support any type of road pricing. Road Pricing could be set by the various authorities controlling various roads and infrastructure elements (local, county, state, bridges/tunnels, federal) and special programs could be conceived for various classes of travelers (professional, pleasure, special needs etc.).

Because the benefits to the users are so significant, there would be a path to charge participants a small fee while assuring a compelling service to the public. Privacy and safety can be designed into such systems, the public sector does not need to collect individual citizens' information.

## How to get there:

1. **Road Pricing Research** - obtain federal funding to create simulation models using existing vehicle fleet data (Hum-Verizon, Onstar-GM, Mbrace-Mercedes, Uconnect-Ford etc). These simulation models will evaluate alternate (Road and Trip) pricing plans and study the effects of MaaS on various constituents (Citizens, Towns, Counties, States, Federal). Study results will provide a basis for policy making.
2. **Create a RFI/RFQ process** for aspiring License Holders to design and build a MaaS infrastructure.
3. **Consider legislative levers** to provide compelling conditions for travelers to partake in MaaS services. e.g.:
  - Today's carpooling legislation: Requires 6 passengers or more
  - Corporate policies wrt carpooling & office parking, work hours, work location requirements all provide levers to influence commuter & traveler behavior.

## Responses to the Discussion Points General

1. What are the intermediate timeframes and pathways to new or enhanced clean transportation systems? What clean and reliable transportation goals should be set for 2030 and 2050?

We need to develop benchmarks for:

- **Access to Mobility:** Transit Screen developed a Mobility Index for Real Estate. <http://blog.transitscreen.com/introducing-mobilityscore>
- Index for energy used per mile / at macro and micro levels
- Use levels of shared transportation facilities
- Customer satisfaction of shared transportation facilities

2. What is the most significant obstacle that the state will face in implementing a clean transportation plan by 2050? What are some solutions to these challenges?

- Courage & visionary leadership in the public sector. The idea that the private sector will come up with the solutions to everything will not get us anywhere desirable.
- Design focus needs to be on Value for the Traveler AND Society.

3. What is the role of clean transportation in freight movement? What should the State do to promote low-carbon freight/goods movement?

4. How can clean transportation solutions impact goods movement and economic growth?

- Tremendous impact. We can schedule cargo to low congestion hours, we can create reservation systems to load and unload in urban / congestion communities in order to avoid adding to congestion.
- Healthy policy will facilitate optimal use of existing infrastructure and promote innovative thinking
- EV lack of gas tax contribution is something that needs to be addressed (roadpricing asap)

5. What are the regulatory or statutory barriers to the expansion of low- and zeroemission vehicles?

6. What are the clean fuel transportation approaches the State should consider to achieve its zero emission vehicle (ZEV) goals of 330,000 ZEVs on the road by 2025?

- An overall MaaS policy can provide incentives for alternate choices. There is no point in promoting technology for technology sake.

7. What actions can the state take with its own fleet to demonstrate clean transportation leadership? How would these actions affect service reliability?

- The state can use its own operation as a testing ground for new technology assessment.

8. What strategic incentives should be considered for encouraging the adoption of zero emission vehicles, plug in hybrids, and other low emission and clean fuel transportation?

- MaaS & Roadpricing could include measures to encourage (e-)bicycles, EVs, public transportation, car pooling, discourage single occupancy vehicle parking, preferred lane access in congested conditions,

9. What best practices can the state adopt from other states and local governments that have advanced clean transportation goals?

- Oregon has done a lot of work on roadpricing. We should learn from their work and incorporate it in our planning. We should engage NJ technology companies like Verizon to help.

10. What actions can the state take to help promote clean and reliable transportation at the state's ports?

11. What role should utilities play in clean transportation? Discussion Points: Clean and Reliable Transportation 9/20/18 3 Technological Advancements

12. What existing and emerging technologies need to be incorporated into future transportation planning?

- 4G/5G, high precision GPS/RTK positioning, Open Air Roadpricing (no EZpass gantries), Smartphone apps etc etc.

13. How can the State best encourage research and development of new technologies?

- By creating goals and a vision (leadership) that is harmonious coast to coast. Programs need to address needs of individuals AND Society. Only the public sector and articulate the needs for society. Programs allow private industry to step into and provide components which are in line with the public policy.

14. How could new technology impact infrastructure investment?

- Infrastructure Investment could be enabled by roadpricing. Roadpricing could secure a revenue flow based on which private sector can make investment decisions.

15. What infrastructure investments, policies, and procedures are needed to support the future of clean transportation in the state? What infrastructure needs will the state have in the promotion of clean and alternative fuel vehicles?

16. What clean transportation funding mechanisms should the state explore? What type of financial planning and programming should be considered?

- Consider what can be achieved through a licensing policy, analogous to the wireless spectrum licensing. A right to operate a business can come with conditions that support our public policy and provide a pathway for realizing public policy. Oversight is a condition to continued licensing.

17. What incentives can New Jersey explore to encourage the transition to clean transportation?

- Roadpricing, Vehicle Miles Traveled, Parking pricing, Congestion Pricing
- Stimulate shared transportation use (access to HOV lanes, commuting car pooling/sharing incentives, ask businesses to implement stimuli for all these things ie eliminate free parking for single occupancy vehicles at place of work)

18. What is the effect of increasing alternative fuel vehicle adoption on energy generation and the utility distribution system? What role should utilities play?

- Public sector should just set objectives and allow the private sector to find ways to fulfill on these. Setting fuel targets may not be productive.

19. How can clean transportation systems assist in assuring enhanced energy security, reliability, and resiliency?

- Do not ask how. Set the standards and enforce them. Create conditions for oversight so that data are generated to analyse situations where we miss targets and can discover what is missing to be able to meet the targets.
- Enable a healthy level of competition/balanced with regulation.

20. What strategies can NJ TRANSIT develop (infrastructure, facilities, vehicles, labor, workforce, training, etc.) to implement clean transportation (buses, paratransit and rail) by 2030 and 2050 while maintaining reliability?
21. What new industries will be needed to meet clean transportation goals? What new jobs and training will be needed to meet the demands of these industries?
22. What is the impact of changes in transportation on the mobility of the workforce?
23. How does the state encourage innovation startups in this sector?
24. What are possible public-private partnerships in transportation innovation and what do they look like?
25. What strategies could be implemented to allow for disproportionately impacted communities to have access to clean transportation options?
- MaaS could include conditions for a variety of constituent groups to help disproportionately disadvantaged constituents.
26. What efforts are most successful towards making clean energy measures and zero emission vehicles affordable and accessible to all?
- Many costs of transportation today are externalized. E.g. Congestion, emissions, safety
  - Internalizing these costs in the decision making process of individuals who chose a means to get from A to B would make a major difference and provide fine tuned levers for us to better tune the supply and demand..
27. How can the state play a role in ensuring that disproportionately impacted communities receive opportunities and benefits connected to the clean energy economy and expansion of low and zero emission vehicles?





