



Why Mobility as a Service is a "fraud" and autonomous vehicles are not a panacea



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The MaaS pitch is as simple as FREEDOM

Go where you want, when you want cheaply - cheaper than public transport (some estimates). Does this sound familiar?

It should. This is the mantra of the car industry in the 1940's onwards to now.

Transport is the real service

Transport is a service and (with the exception of walking, cycling and driving for pleasure) only exists movement of goods that support society and to enable people to move as part of their daily lives.

Ride sharing and Mobility as a Service (MaaS)

The rise of the Ride Sharing companies (you know their names) and increased big data availability has led to a new term - *Mobility as a Service (MaaS)*.

Self driving, connected and autonomous vehicles will massively increase road safety and opportunities for less independent (young, old, infirm, mobility impaired) people and improve quality of life. However, the utopia many see has risks and is framed by commercial opportunities.

Consider the sales pitch for buying a car (as best summed up by the Simpsons). Don't share a dirty subway (bus, tram, train - substitute your favourite shared vehicle) when you can drive in your own car (rideshare, self driving autonomous) vehicle and not worry about others. The Sales pitch for ride sharing is to book a vehicle and get an instant notification of when your vehicle will arrive and know the cost

Ride Sharing is not as it seems

The original Ride Sharing has a less glamorous name - CARPOOLING. Modern Ride Sharing is nothing like this. Ride sharing itself is a misnomer for as it is Car Sharing (with a driver). These people are not already on their way to a destination - they are working to earn money by taking you where you want to go - exactly like a Taxi, but cheaper and with App based safeguards rather than CCTV etc). When Ride sharing (or unregulated taxis) turned up in San Francisco, traffic congestion increased as the vehicles circulated the CBD during the PM peak waiting for trips, blocking roads - Imagine empty, autonomous cars with very low operating costs doing this.

MaaS is more of the same - Profit driven; anti public transport, anti walking, anti cycling

MaaS is a more of Business As Usual being perpetrated on governments and transport agencies under the guise of freedom to move where you want when you want.

Solving the last mile is not a panacea

So, what does MaaS do to our transport system. Solving the last mile link for able-bodied adults may solve parking at railway stations and bus terminals. But once you are in a MaaS vehicle - what is incentive to get onto the "dirty" public transport vehicle?

Using my own journey as an example, I live 65 km from work for lifestyle reasons. I have various transport options including:

- 1) I can walk 10 minutes to a station, travel for 75 minutes on a train and walk for 5 minutes to my work (90 minutes total) for a total cost of \$9 (train ticket - excluding value of time). This results in 15 minutes physical activity and 75 minutes work/personal time.
- 2) I can drive the entire way and with early bird parking, park close to work. Driving time is 70 - 120 minutes and the walk is 10 minutes for a total cost of \$20 (incl parking, car costs excl. depreciation). This results in 10 minutes activity and 0 minutes work/personal time.

3) I can drive 20 minutes to another station with plenty of parking, travel 45 minutes on a train and walk for 7 minutes (72 minutes total) to my work for a total cost of \$10 (incl train, car costs). This results in 5 minutes activity and 45 work / personal time (My personal choice at the moment).

4) So when when Autonomous cars and MaaS (aMaaS) combine (if available where I live), the cost of driving to work drops to the operating cost of the vehicle plus a margin. Under this scenario I can have work/personal time for the entire journey (85 minutes [Exact time would be known]) and my cost reduces to approx \$4-10. (Electric vehicle, no driver - capex + opex + profit margin) with 0 minutes activity OR use the existing options. It is easy to see which wins.

Under scenario 4 - my last mile is solved. Am I better off?

- In time and *doing things* - yes
- Activity - no
- Cost - yes/no
- Health - Definitely not
- Sustainability - Definitely not
- Efficient use of the transport system - Definitely not

aMaaS is destructive without Road User Charging

Currently most public transport systems try to optimise for 85% capacity at the peak loading point during the peak hour. As a result governments/operators have vehicles that are not needed outside peak periods. However, when the Opex is close to zero with aMaaS, but the Capex is high (initially), the incentive is to have the vehicles in the system at all times, travelling to wherever there is a fare.

When parking of aMaaS vehicles is not a necessity, what happens during off-peak periods? Parking costs money (in charges, land or alienated public space). aMaaS operators will be private companies with an incentive to lower costs. Driving (at \$0.30 /kwh for electric vehicles) is substantially lower than a CBD parking/storage charge.

The US Department of Energy has forecast a 70 percent increase in congestion with self driving and connected vehicles. Add to that empty aMaaS vehicles floating around to not pay for parking, city streets could become even more congested than now. While everyone will know their travel time under a 100 percent aMaaS system there will still be demand for improved journey times - resulting in no gains for urban space and pedestrians.

Without a cost being imposed on excessive use of the road network, there is little incentive for aMaaS operators to work to reduce congestion. It may potentially be the opposite (especially if aMaaS costs are time based).

What space will people have?

Volvo (and others) claim we can eliminate car parking, remove signs and signals and give space back to people. But if travel demand increases (as it did when we moved from foot to horse/cart to train to bicycle to tram to aeroplane) and congestion increases will the aMaaS companies support reducing the number of lanes (parking + car is converted to footpath + car) or will they want that space kept for their vehicles (parking + car converted to car - remember the profit motive).

Risk incentives are currently weighted away from autonomous vehicles toward pedestrians and bicycles. A pedestrian can block the path of an aMaaS vehicle and it will stop. At one workshop, I have already heard calls for fencing and grade separation (1980s anyone) to ensure that aMaaS vehicles can move efficiently.

On top of this, we are already seeing delivery robots (through their owners) fighting for rights to use the footpath space and claim it from people - so what will people be left with?

It is time for a new hierarchy of movement!

Anyone who has seen my presentations on Autonomous vehicles has seen my proposed hierarchy for movement. We currently have road focused hierarchies that are changing towards the Link (movement) and Place (people) concepts developed by Rodney Tolley (and others) in the 1980s. This works when humans are making the decisions. When computers make the decisions - they need clear demarcations and coded instructions. Thankfully these can be time of day and day of week based and sent to the aMaaS vehicles via Infrastructure to Vehicle Intelligent Transport Systems.

Our current two-dimension road hierarchy needs to become 3 or more dimensions based on community needs, movement volumes, street life, sustainability, the time of day, the types of users.

Under a smart aMaaS system, lane can be opened and closed (e.g for street dining) with 100 percent instantaneous compliance. Speed limits can be raised and lowered based on road noise (e.g. lowering speed limits and providing trucks priority at night to reduce truck noise).

Below is a hierarchy that can be modified on needs and will require active traffic and place managers, monitoring, planning and adapting it across the day.

Location	Function	Priority
Local Street / CBD	Human scale movement	Pedestrians and bicycle priority
Lower activity urban streets	Access / Transition	Pedestrians / bicycles / lower speed autonomous vehicles (30 km/h speed limit)
Collector / Distribution Street	Transition	Pedestrian areas separated from roadway by cycleways / wide verges / bus ways
Automated Roads	Traffic	Intra city movement / high volume
Motorways	Traffic	Inter City movement / high volume / high speed

aMaaS is coming

The challenge for communities, place managers, engineers and planners is to ensure that the recent gains in increased urban amenity and quality are not lost in the electric / autonomous / MaaS system.

NB The content of this article is personal opinion and does not represent the opinions of my employer.