The Driverless Taxi, Driverless Transit Nexus

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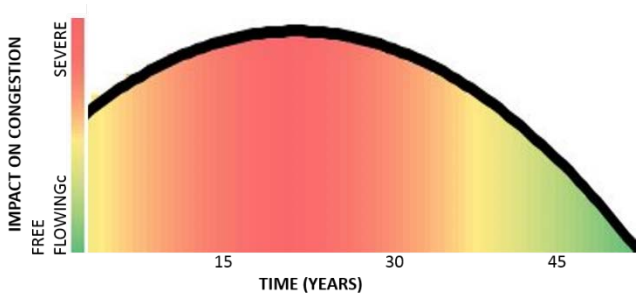
Mercedes just announced they will start building driverless taxis in the 2020 – 2025 timeframe. These vehicles will cost far less than conventional taxis to operate and will likely provide an affordable means of transportation for many people who could then forego car ownership and save substantial money. Each driverless taxi will operate almost 24/7 and not that many will be needed before they dominate vehicle miles traveled (VMT). Some predict that they will be responsible for 90% of VMT by 2030.

This potentially rapid switch to driverless taxis could have profound positive and negative impacts. Mobility and safety will improve for many. However, taxi drivers, auto dealers, rental car companies, parking facilities, etc. will go out of business and/or have to reinvent themselves. In addition, contrary to common hype, driverless cars will add to congestion for many years before they reduce it (if they ever do). Some of the reasons for this are:



Impact of Driverless Cars on Congestion
Data source: ITS International

- Driverless taxis will add to VMT by driving empty to pick up the next fare
- Urban sprawl may increase with less expensive transportation
- HOV lanes that change direction for morning and evening peaks will no longer work
    - This is because empty taxis returning for the next fare will balance flows in each direction
- Platooning, narrower lanes, etc. require most vehicles to be driverless and require infrastructure changes

Thus, the improved mobility will be hampered by increased congestion.

This is where driverless transit that has its own infrastructure fits in. Automated transit networks (ATN, aka personal rapid transit) are comprised of driverless small (car-sized) vehicles traveling on dedicated (usually elevated) guideways. Such systems have been in public service for decades and have higher capacity and average speed than light rail, while costing far less to build and operate. New generations of these systems are being developed that will provide quicker service than cars and have guideway capacity similar to seven freeway lanes.

ATN Station

ATN systems can be deployed along and/or adjacent to freeway corridors. A typical arrangement could consist of many interconnected one-way loops forming a ladder-like layout. The legs of the ladder could be about a mile or two apart and could straddle the freeway alignment. The rungs

would alternate in direction and provide access from one leg to the other. Offline stations could be located about half a mile apart on both legs and rungs. Thus, an area about two miles wide centered on the freeway would have a high-quality transit system within walking distance for most people. Many studies have shown that an ATN system will attract drivers from their cars and the freeway congestion would immediately start to diminish.

But what about the people further away from the freeway? This is where driverless taxis could play a key role. These areas are likely to be less congested and the taxis and autonomous shuttles could very effectively bring people to the ATN stations thereby greatly increasing the transit service area and the ridership. Furthermore, an ATN system creates jobs for the initial construction as well as for operations and maintenance.

The combination of driverless taxis and transit could be the best way to deal with the coming driverless revolution.

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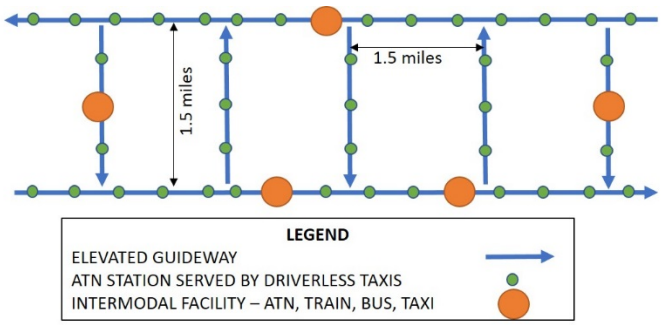
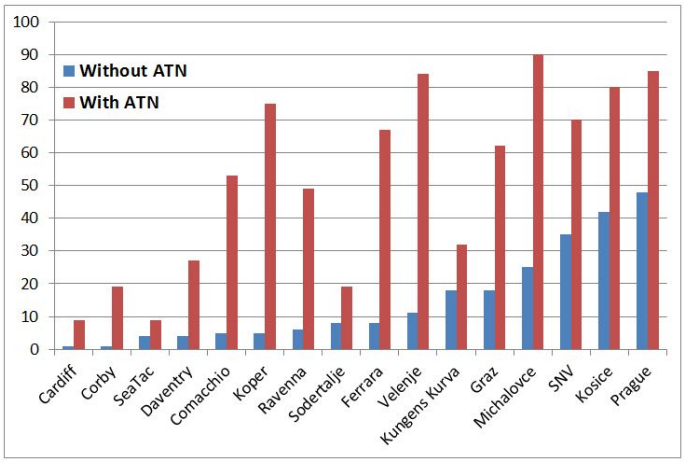


Schematic ATN Layout



Transit mode share with and without ATN
Source: Studies in named cities