



## TIMING OF AVs and TRANSPORTATION DISRUPTION

An overview created by Walker Consultants



*Image Source: <http://blog.carrotinsurance.com/getting-from-a-to-b-the-futuristic-way/>*

### INTRODUCTION

Fully-autonomous vehicles are currently in the testing phase and most industry experts believe these vehicles will soon be available to consumers. AVs could disrupt transportation since households would likely need fewer cars to meet transportation needs. For example, one AV could drop off a family member, and drive itself to pick up another.

It is also possible that ride-hailing companies (or transportation network companies, TNCs), like Uber and Lyft, could equip vehicle fleets with on-demand autonomous technology. These AV fleets could transform travel, and personal vehicle ownership rates could decline significantly.

There are several ways that autonomous vehicles (AVs) could decrease parking demand and impact parking planning, design, and construction. For example, a fully-AV may be able to drop off a passenger and return home, instead of parking. It could also reduce the number of cars per household, since the vehicle could, case in point, drop off a parent and drive on to drop off a child at school. Vehicles that do park could park themselves, so accommodations in parking facilities may need to be made to support this.

A future scenario involving AV fleets may have greater impacts on personal vehicle ownership, and in turn, parking. Many foresee that TNC fleets equipped with AV technology could significantly reduce operational costs and create a transportation market disruption, one consequential enough to render private vehicle ownership obsolete – at least for a significant portion of the marketplace.

## AV TECHNOLOGY TIMING AND INDUSTRY REPORTS

It is estimated that by 2030, 20% of new cars sold in the U.S. could be fully autonomous. How does this assumption provide insight into changes and the timeline of AV adoption and absorption? There are an estimated 265 million registered passenger vehicles in the U.S. today, an estimated 17.5 million new passenger vehicles were sold in 2016 to U.S. consumers, and the average age of cars on U.S. roads is about eleven and one half years. Therefore, AVs are expected to represent a small percentage of the total number of cars on U.S. roads in 2030. Moreover, most experts are predicting that AVs may soon be commercially available, but would potentially not represent a majority of the vehicles on the road for decades.

## INDUSTRY EXECUTIVE OPINIONS

To supplement research findings, it is useful to hear what industry executives have to say about the timing of AVs, to see if their opinions corroborate with industry report findings. After all, these individuals tend to exude optimism for AVs more aggressively and ambitiously than most, yet even these leaders are telling us that it will be decades before AVs will represent a majority of cars on U.S. streets



**Bill Gurley**, a venture capitalist and early investor in Uber: It will be more than 25 years before fully-AVs saturate the market due to regulation and because “The part we haven’t figure out yet, the last 3 percent, which is snow, rain, [is] all the really, really hard stuff...”<sup>1</sup>



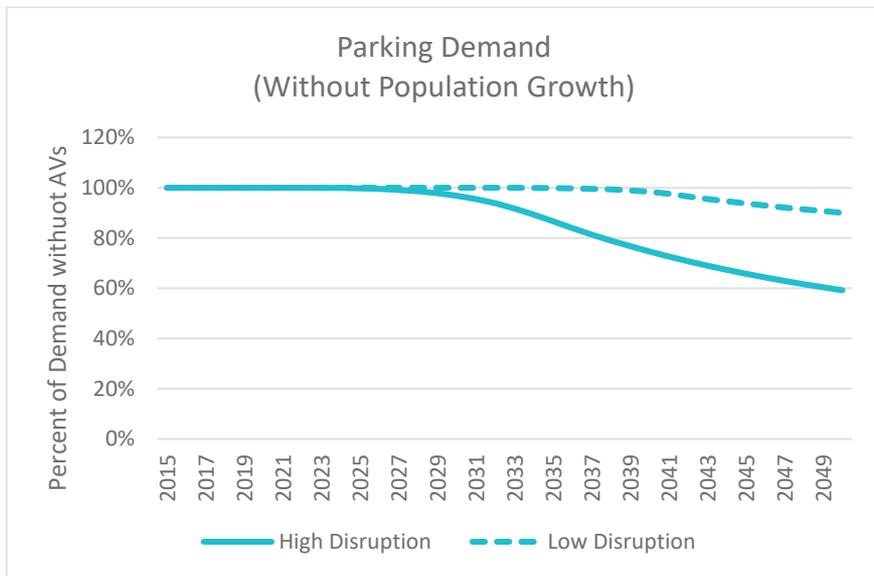
**Elon Musk**, Co-Founder and CEO of Tesla Inc: “There are about 2 billion cars in the world... So the point for which we see autonomy appear [in 10 years] will not be the point when we see a massive impact on people because it will take a lot of time to make enough autonomous vehicles to disrupt. That disruption will take place for about 20 years.”<sup>2</sup>



**Raj Rajkumar**, co-director of the General Motors – Carnegie Mellon Autonomous Driving Collaborative Research Lab: Fully-AVs are at least a decade away, because of software and infrastructure needs, and: “Self-driving cars can only do what programmers tell them to do. They can’t anticipate everything that can happen on the road.”<sup>3</sup>

Some consensus views from experts emerged from our research, and these views include:

- As much as 20% of new vehicle sales in the U.S. could be fully-AVs by 2030, which would likely account for a small percentage of total cars on the road at this time.
- Transportation disruption has the potential to reduce parking demand by a large amount, but not before 2030. A disruption scenario also depends on a number of complicated factors coming together, including consumer acceptance of car-sharing and/or ride-sharing on a widespread scale.
- Effects on parking demand could begin in urban areas and become more dramatic in urban areas over time.



### WALKER'S OPINION

The first issue in planning for the future is understanding the potential impact on parking demand and the timeline. We estimate that the realistic overall maximum reduction, **nationally**, in parking is about 40% at a high disruption scenario, and as low as 10% in a low disruption scenario. The impact at a specific site will be dependent on density; it will be greater in the urban core, and much lower in rural areas. It will vary by geographic area and land use. Walker has created a projection of vehicles on the road based on a consensus of nationally-recognized consultants' projections of vehicles sales<sup>4</sup> as well as historic vehicle scrappage rates.<sup>5</sup> It will take a long time to get the current 265 million non-autonomous vehicles off the road.

If a parking facility serves an area or campus that tends to grow with population and economic development, parking demand would likely grow through about 2030 and only then begin to decline and reach the ultimate impact no sooner than 2040.

### CONCLUSION

The AV timing studies and the transportation disruption studies all share similar assumptions, which determine both the timing and the impact of these changes. In order for AVs to saturate the vehicle market, the cost of the technology would have to be low enough to entice consumers and TNC companies, and consumers will need to trust the safety and reliability of AV technology.

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## ABOUT THE AUTHOR

**Walker Consultants** is the global leader in providing parking consulting and parking design services. Founded in 1965, we pioneered the field of parking consulting. Today the firm has over 300 employees delivering a wide range of parking planning, design, engineering, and restoration services.

The firm is based in the U.S. with 17 domestic offices and 1 in the United Arab Emirates, is ranked #240 in Engineering News Record's Top 500 Design Firms and #13 in Building Design + Construction's Giants 300 Engineering/Architecture Firms.

We serve a broad spectrum of markets including healthcare, education, government, aviation, residential, retail and commercial development, entertainment, hospitality and athletic venues. This diversity allows our staff the luxury of collaborating with a large cross section of client types and developing best practices for their specific development needs, helping them unlock the potential of their projects.

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