

Driverless Cars & Their Implications for Zoning



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Pace Land Use Law Conference, White Plains– December 2017

A. IT'S NOT ONE "THING"

0. Human Drivers by themselves

1. Driver Assistance

- System helps steer / accel / decel

2. Partial Automation

- System can steer / accel/ decel
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3. Conditional Automation

- System also monitors surrounding – but can ask for help

4. High Automation

- System also monitors without human help in some driving conditions
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5. Full Automation

- System can do everything in all driving conditions

Who
Monitors?

Driver

System

Driver
Prepared
to Drive
or Take
Over?

YES

NO

B. IT'S NOT COMING ALL AT ONCE

The Fast Part

- Many makers say they will introduce AVs by 2018-2021
- By 2030 = Maybe 15% of the market is AVs
- By 2040 = Maybe 50% of cars on road are AVs.

You need to start planning TODAY (actually, Yesterday)

The Not All At Once Part

- Now = 263 million non-AV cars, 2 billion parking spaces
- It will take a long time for those to all be replaced or repurposed
- AND we will have to plan for a "mixed AV / non-AV system" for a long, long time

The answers are within our 20-30 year planning horizons

C. INDIVIDUAL VS. SYSTEM OWNERSHIP

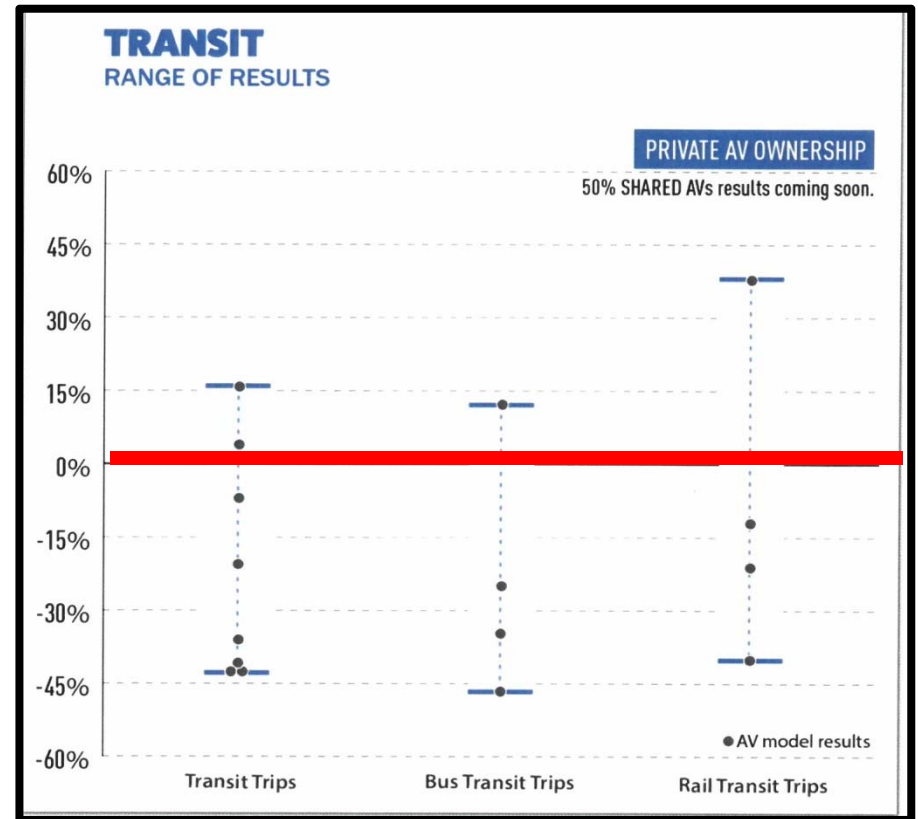
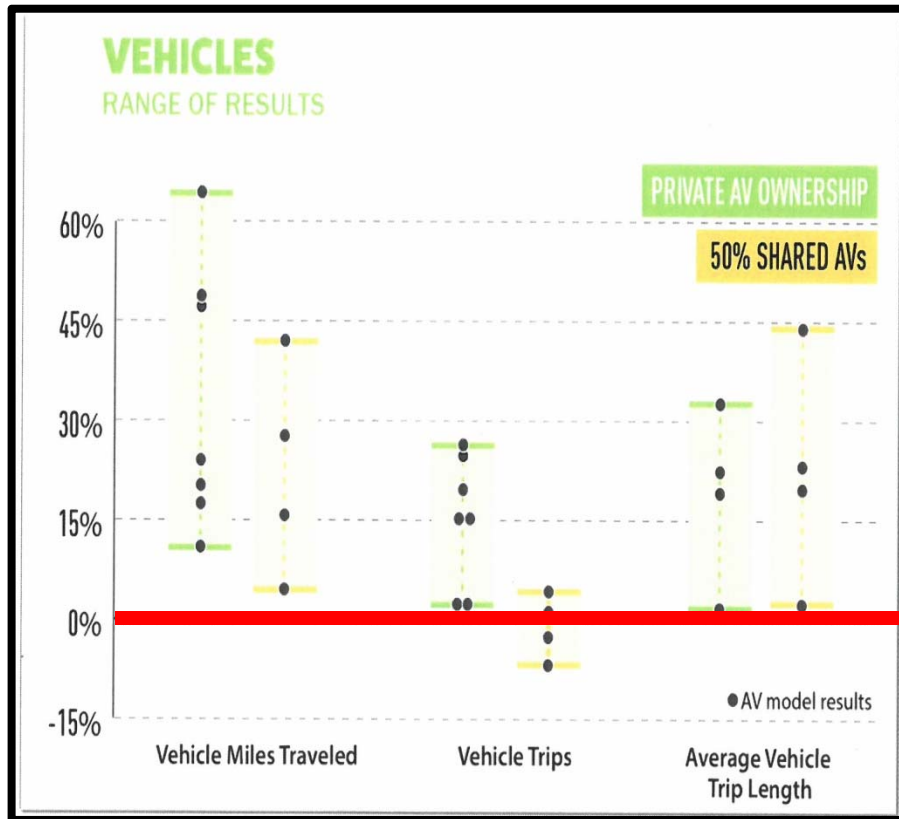
The Dream – Most of them are owned by rideshare systems

- Lower car ownership
- More cars moving more of the time – so fewer of them need to be parked
- Less parking cost = more compact neighborhoods

The Nightmare – Most of them are owned by individuals

- Not much reduction in auto ownership
- Not much reduction in congestion on the roads
- The car is your mobile office, so you can live farther from your office -- so sprawl increases

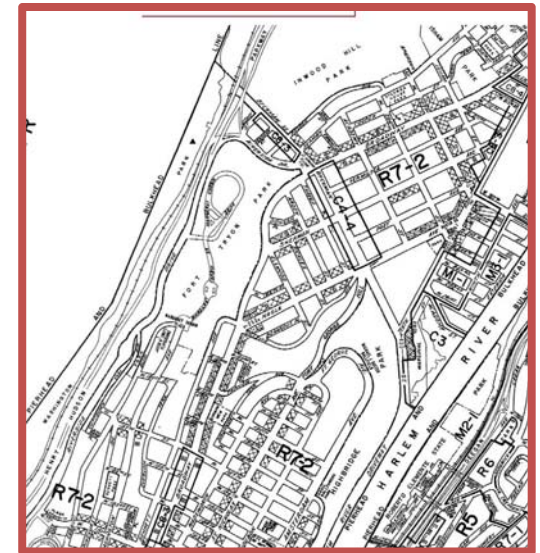
C. INDIVIDUAL VS. SYSTEM OWNERSHIP



HOW WILL ZONING NEED TO CHANGE?

Four Key Areas of Zoning Regulation

1. Permitted Land Use
2. Parking / Loading / Staging
3. Street Edges and the Public Realm
4. Development Patterns



HOW WILL ZONING NEED TO CHANGE?

1. Permitted (or Required) Land Use

Review permitted uses and broaden the range of allowed uses for:

1. Parking lots and garages
2. Car dealerships
3. Gas stations (125,000) and repair shops (175,000) in high value locations
4. 125,000 auto repair / auto body shops / wrecking yards



Require “reuse-ready” designs and broaden the range of permitted use or reuses for these structures

HOW WILL ZONING NEED TO CHANGE?

2. Parking / Loading / Staging

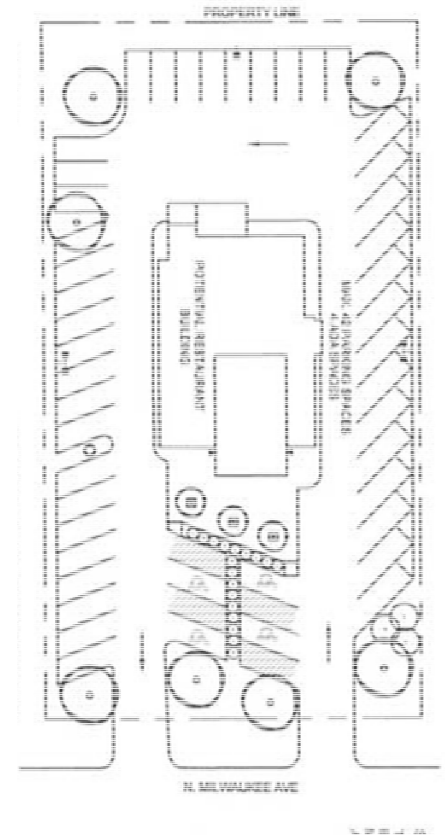
- Lower auto ownership, smaller vehicles, parking closer together can reduce space devoted to parking
- Shared AVs will be moving more of the time, parked less of the time
- Even if shared AVs are moving more of the time, there will be “downtimes” between rides.
- Shared ride operators will compete on convenience/ response time



Lower or remove on-site / in-building parking location requirements as AV use increases



Expect more requests for “staging areas” distributed for convenient response and expect operators to try to make them “proprietary” – not open to competitors

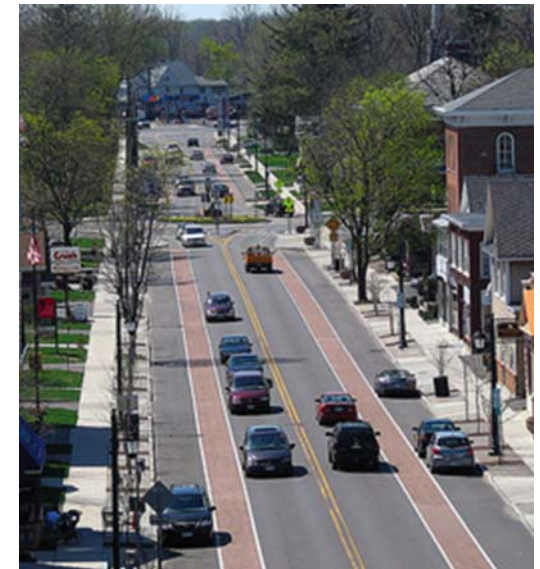


HOW WILL ZONING NEED TO CHANGE?

3. Street Edges and the Public Realm

Drop-off Areas v. Parking Areas

- Reduced need for parking areas (mostly on private property) will be offset by increased need for pick-up/drop-off areas
- Pick-up/drop-off areas will be needed close to almost all destinations
- Some pick-up/drop-off areas will need to be on public r-o-w, but where that will interfere with traffic flow they will need to be on private property
- “Complete Streets” and “Road diets” become easier



Repurpose parking lanes and create on-site pick-up/drop-off area standards



Revisit street design based on narrower travel lane widths over time.

HOW WILL ZONING NEED TO CHANGE?

4. Development Patterns

The Big Unknown -- Will AVs increase the pressure for sprawl?

- Since I don't have to drive and I can work in the car, I think I'll live further out

VS

- Since I no longer need to own a car, I'll cut out that cost and decide to move closer in



Prepare for more sprawl pressure and put controls in place now



HOW WILL ZONING NEED TO CHANGE?

Three Take-Aways on Zoning

1. Focus on the reduced needs for parking spaces and increased needs for pick-up/drop-off spaces
2. Broaden the number of permitted uses of parking / auto sales / gas stations / body repair structures and land uses
3. Remember that all these changes will happen gradually over time – there will be a lot of non-AV vehicles on the road for a long time



HOW WILL ZONING NEED TO CHANGE?

A Few Disturbing Thoughts

- Jobs will probably disappear
 - 4 million professional drivers in US today
- Walking to and from parking will drop
 - Decline in a routine form of exercise
- We need to ensure service equity to low income neighborhoods
- Watch out for “Mobile AV Billboard Spam”
- AV trends will have synergy with increasing drone deliveries
 - Fewer wheeled delivery vehicles
- Existing transit system ridership may fall unless AV programs coordinated to support them

Questions and Discussion



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HOW WILL ZONING NEED TO CHANGE?

Resources

<http://www.citylab.com/cityfixer/2015/12/why-arent-urban-planners-ready-for-driverless-cars/419346/>

<https://www.theguardian.com/technology/2014/jul/16/google-fbi-driverless-cars-leathal-weapons-autonomous>

<http://www.bloomberg.com/news/articles/2014-07-16/automated-cars-may-boost-fuel-use-toyota-scientist-says>

<http://www.curbed.com/2016/8/8/12404658/autonomous-car-future-parking-lot-driverless-urban-planning>

<http://www.scenariomagazine.com/urban-planning-in-an-age-of-driverless-cars/>

http://www.sae.org/misc/pdfs/automated_driving.pdf