



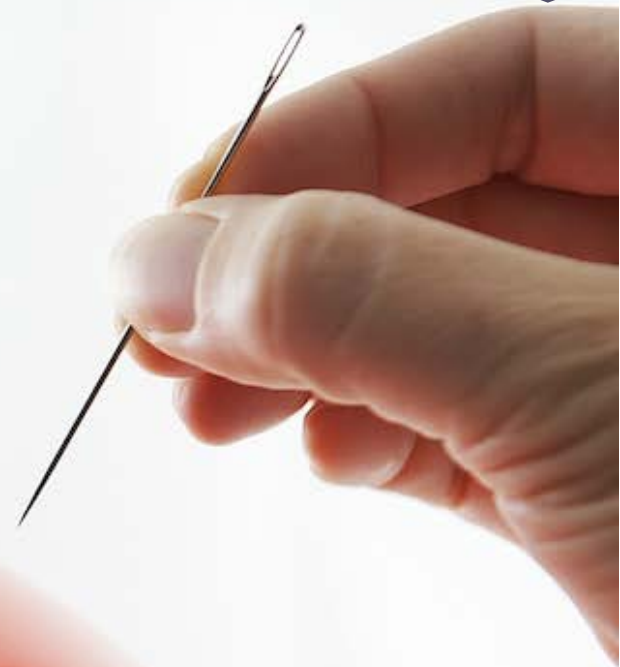
# Uber, AVs, Mobile Payments & Other Industry Disrupters

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# Tolling Industry Disrupters

1. AV – (V2V + V2I) = Cloud Tolling
2. Personal car ownership → corporate ownership
3. Mobile payments drives convergence
4. Cities as tolling clients = New competitors

Good News: 10-year horizon and toll revenue is irreplaceable



# 1. AV tech obviates V2V2I

- AV time horizon = 2020
- V2V2I horizon = 2030

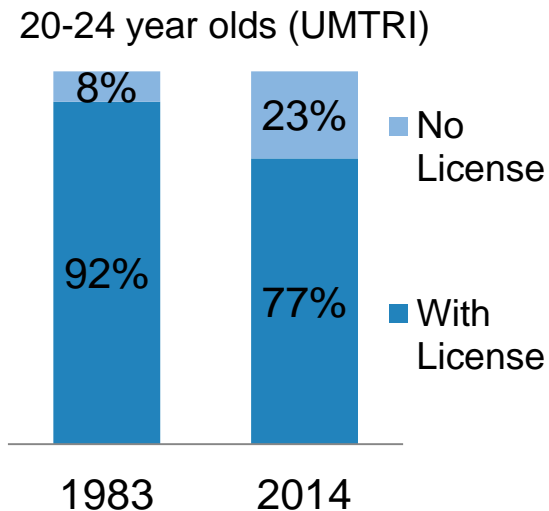
*A disruptive innovation is an innovation that creates a new market and value network [AV Eye] and eventually disrupts an existing market and value network [V2V2I], displacing established market leading firms, products and alliances [look around you].*

- Clayton Christenson
- AVs will be networked and can be handled via Cloud Tolling



## 2. Rise of corporate car ownership

### Decline of Drivers' Licenses



### Rise of Car Sharing




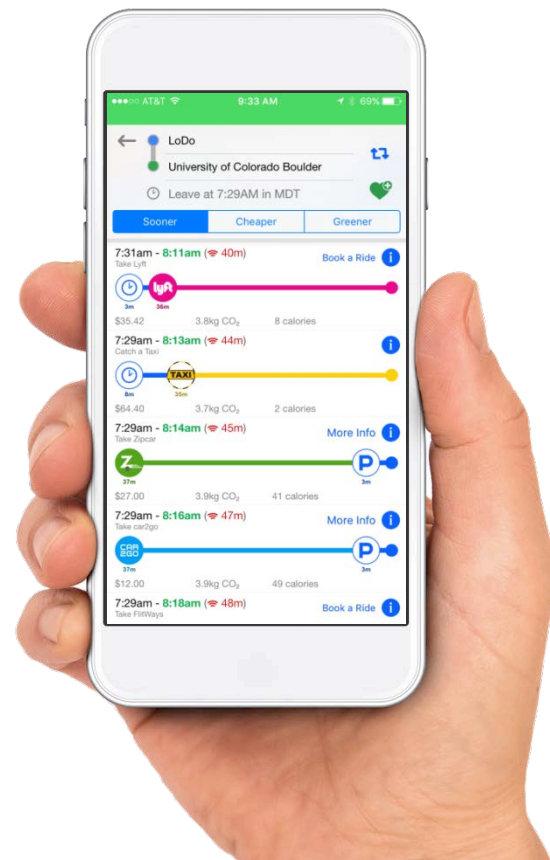
### AVs owned by Corporations



**Decline in personal toll accounts and volume**

# 3. Mobile payments drives convergence

- Smartphones are more ubiquitous than cars
  - Uber-like customer experience expectation
  - Integrated payments for all forms of mobility, except tolling?
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- NFC/Bluetooth/Cloud-driven toll transactions
  - Asset-free alternative for cities, even toll authorities



## 4. Municipal tolling increases competition

### Hypotheses:

- Corporations flood cities with AVs
- Cities levy congestion charge in response
- Shared vehicles require per passenger mile (PPM) toll

### Impact on Tolling:

- If cities implement PPM toll, why not toll authorities?
- Urban Mobility competitors will move out to highways
- OEMs, Cloud, and Mobile Payment companies have cash to burn





# Questions & Answers