

Accelerating Climate Action From the Demand-Side: Transportation

by

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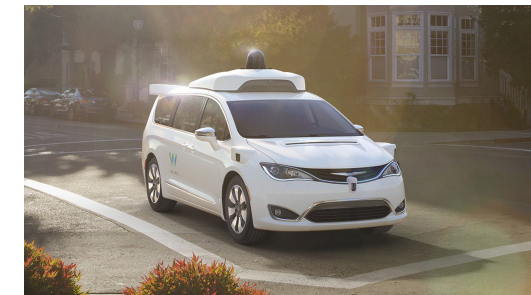
Princeton University

Presented at

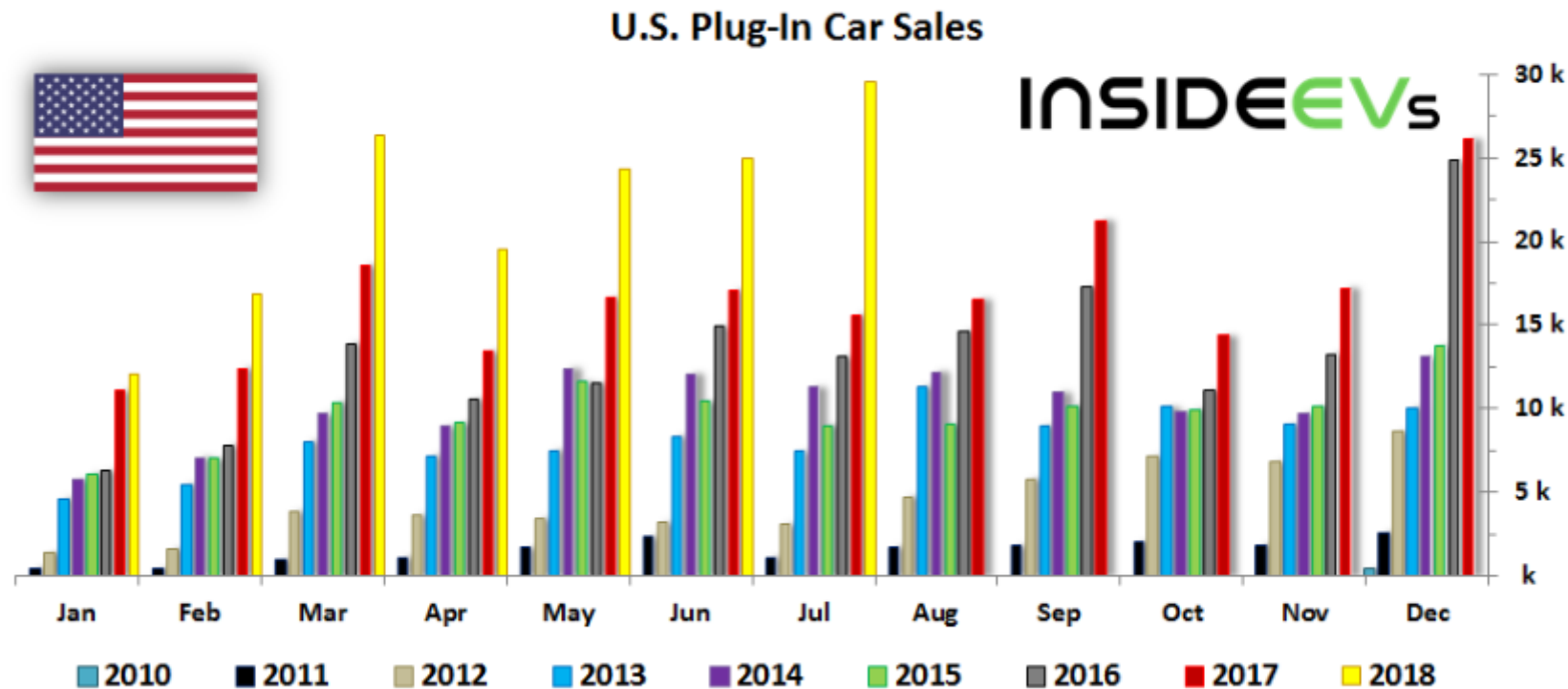
 **andlinger center**
for energy+the environment

Princeton, NJ

September 21, 2018







EV Sales to Consumers



EV Sales to Consumers

2018 Monthly Sales Chart

2018 U.S. EV SALES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Tesla Model 3* 	1875	2485	3820	3750	6000	5902	14250	17800		
Toyota Prius Prime	1496	2050	2922	2626	2924	2237	1984	2071		
Tesla Model S* 	800	1125	3375	1250	1520	2750	1200	2625		
Tesla Model X* 	700	975	2825	1025	1450	2550	1325	2750		
Chevrolet Volt*	713	983	1782	1325	1675	1336	1475	1825		
Chevrolet Bolt EV* 	1177	1424	1774	1275	1125	1083	1175	1225		

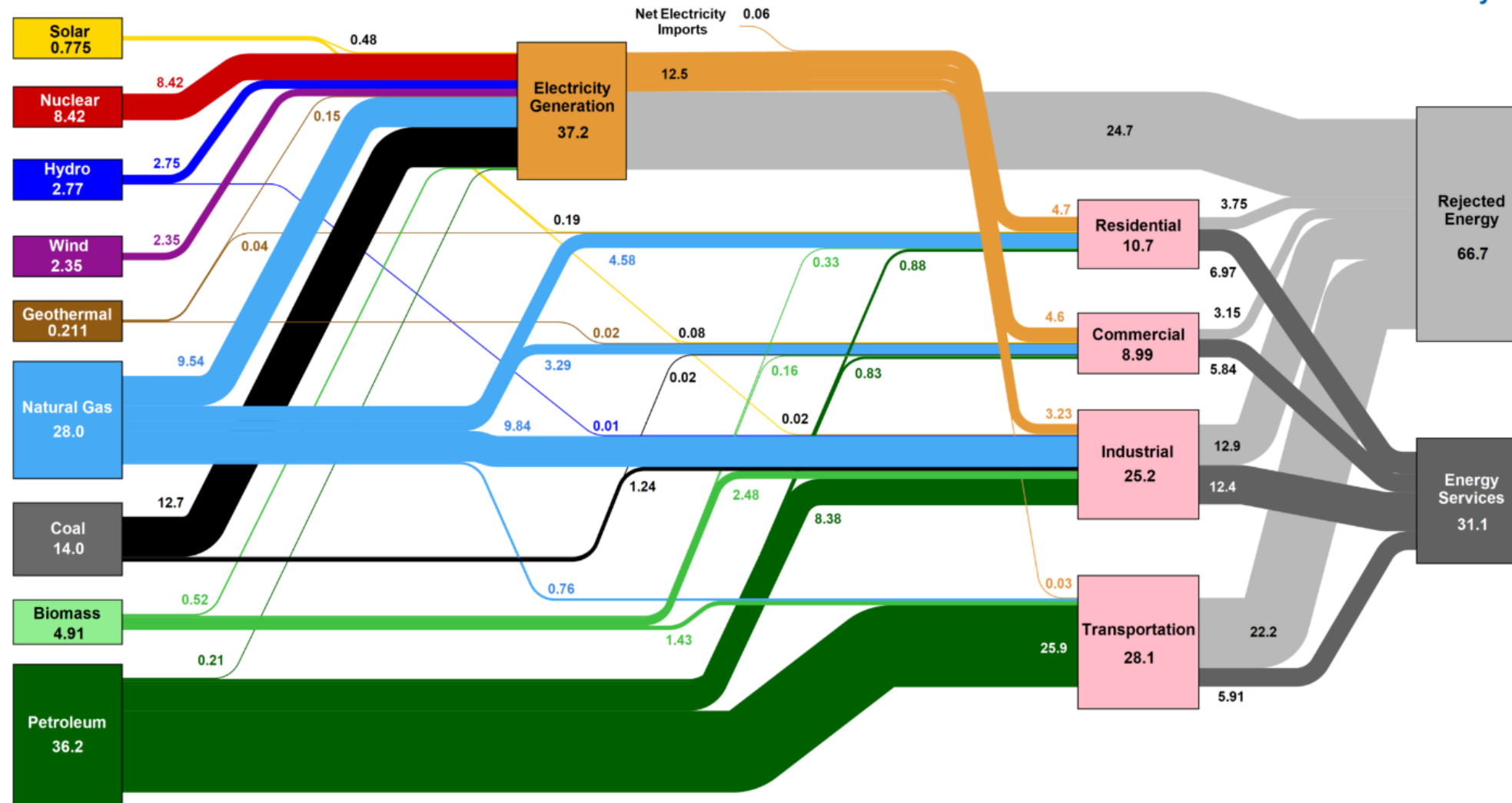
2017 US Sales ~ 200,00 compared to 17M light duty vehicles (~1%)

2017 World Sales ~ 1,000,00 compared to 95M light duty vehicles (~1%)

Energy Flow US

Estimated U.S. Energy Consumption in 2017: 97.7 Quads

Lawrence Livermore National Laboratory



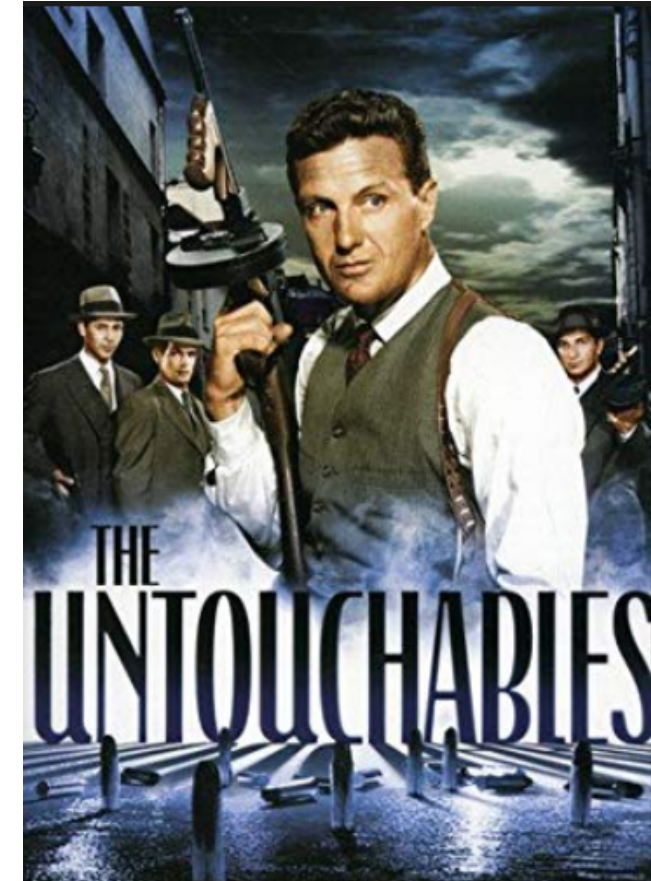
The Problem



Sacred Cows & Untouchables



- Gas Tax
- Carbon Tax
- Transit
- Ride Share
- Automation



When will aTaxis be more than a Novelty ???

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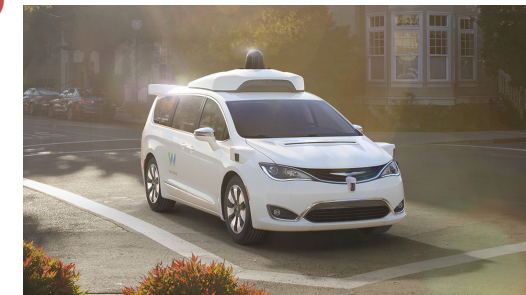
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ITS America 2018

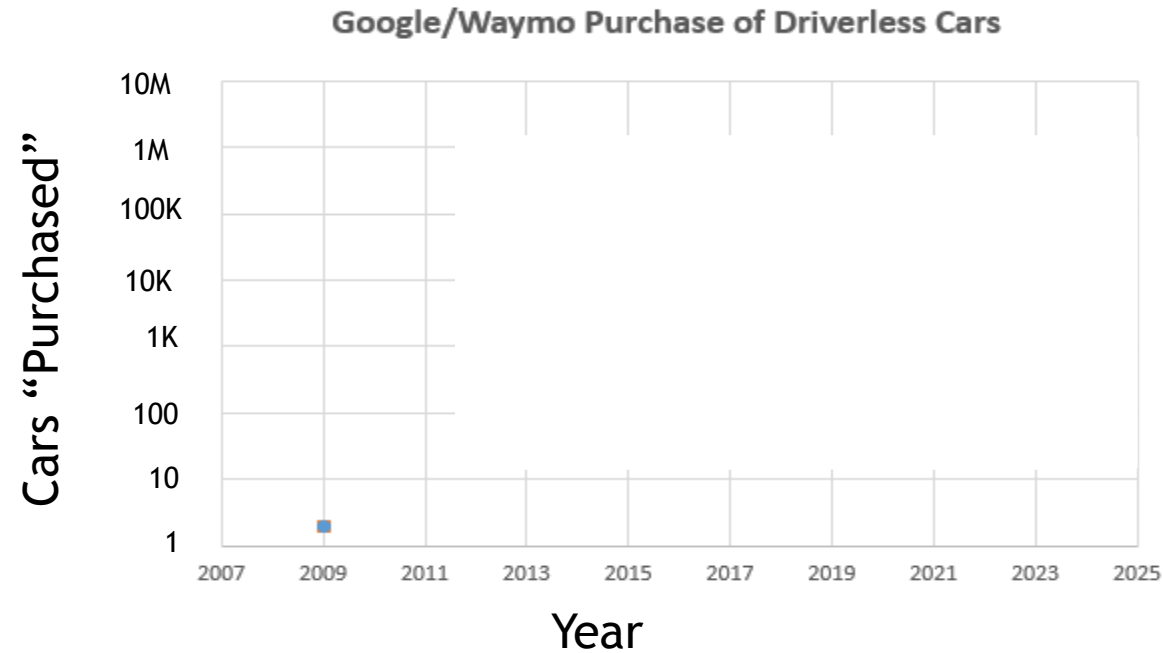
June 5, 2018

Detroit, MI



Have You Noticed???

Google/Waymo's Buying Spree

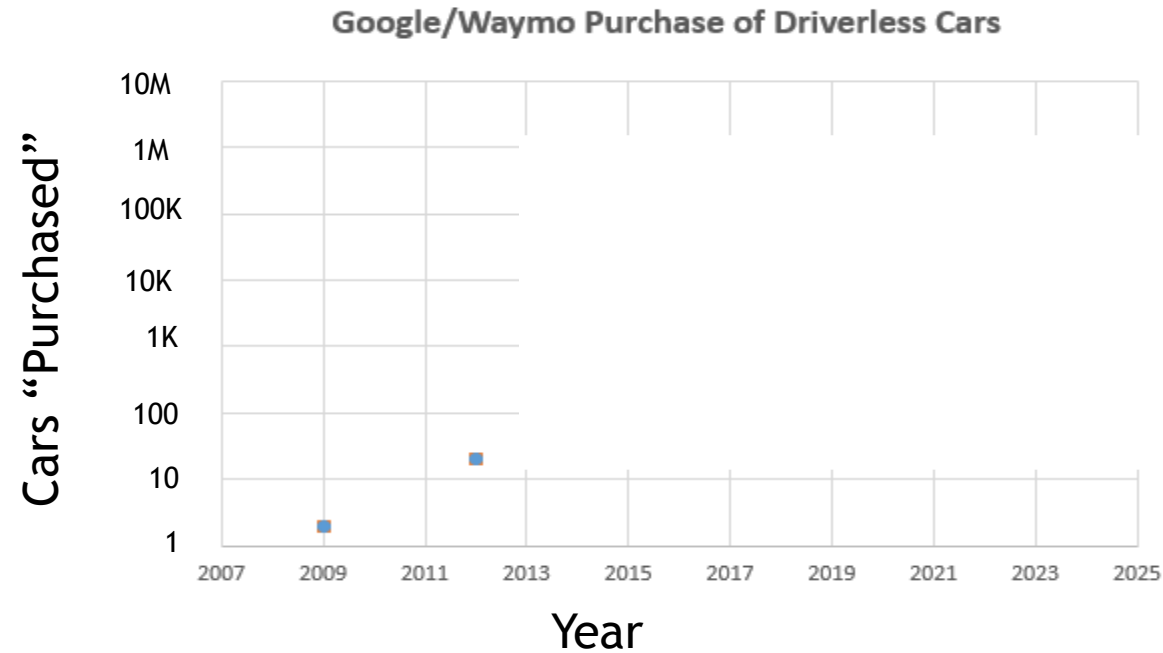


2009



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Google/Waymo's Buying Spree



2009

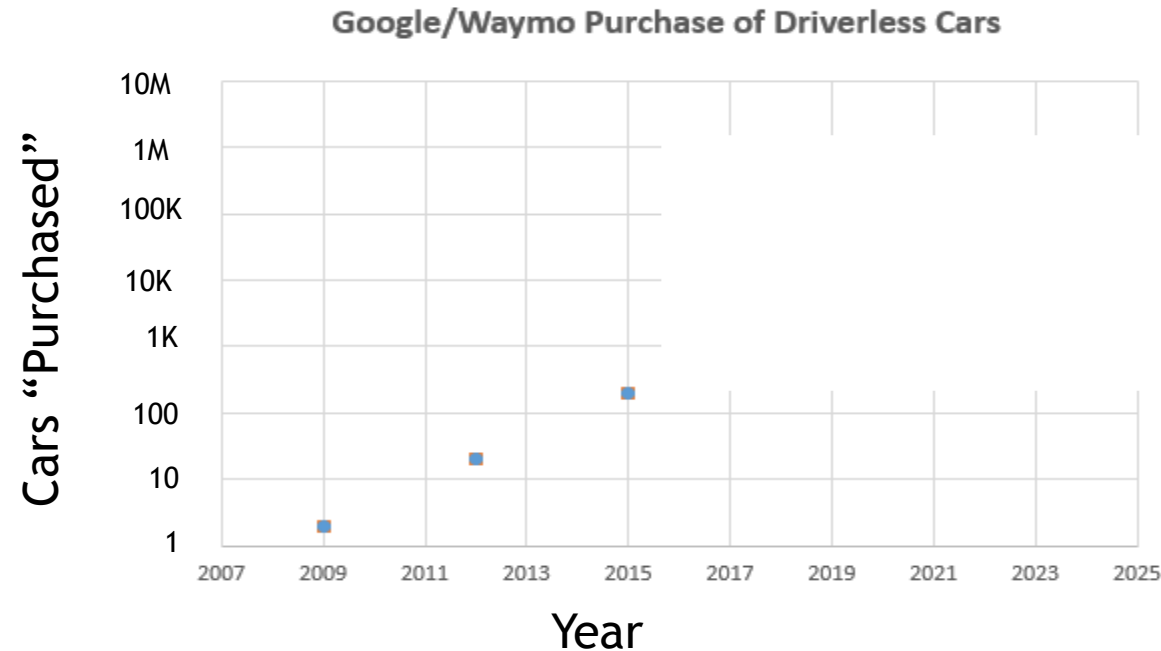


2012



Have You Noticed???

Google/Waymo's Buying Spree



2009



2012

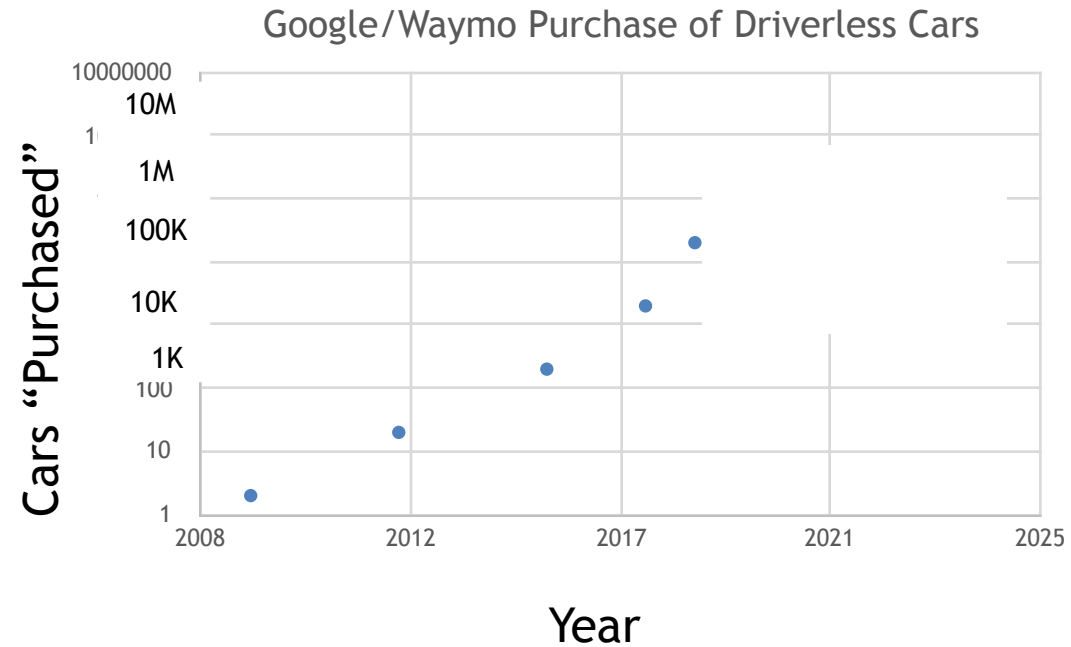


2014-5



Have You Noticed???

Google/Waymo's Buying Spree



2009



2012



2015

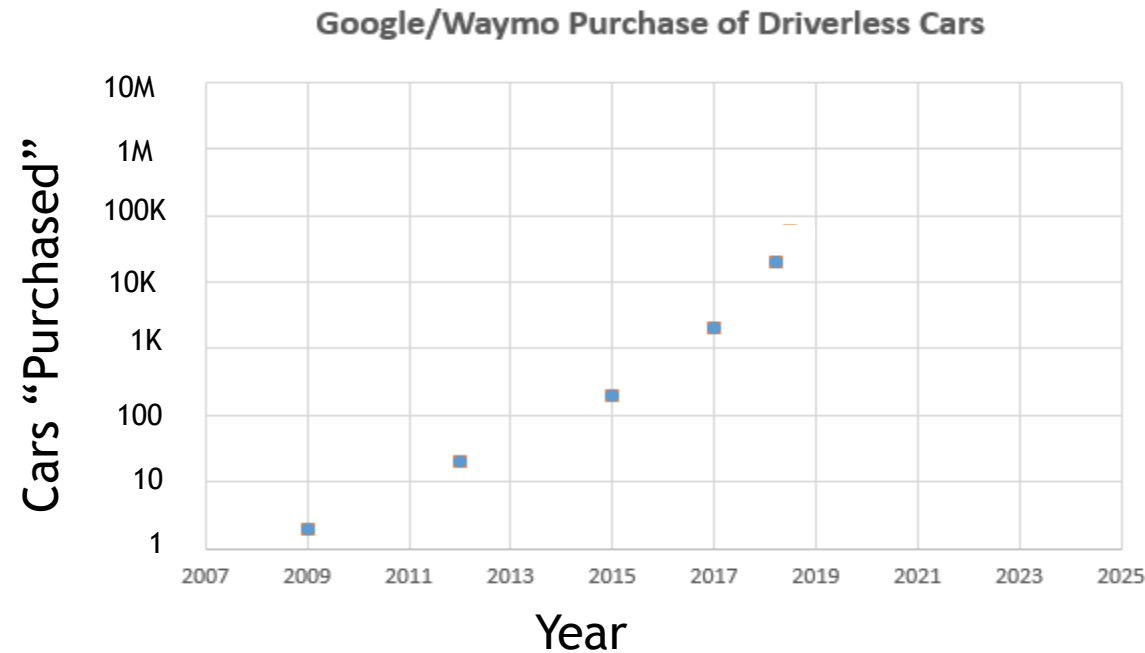


2017



Have You Noticed???

Google/Waymo's Buying Spree



2009



2012



2015



2017

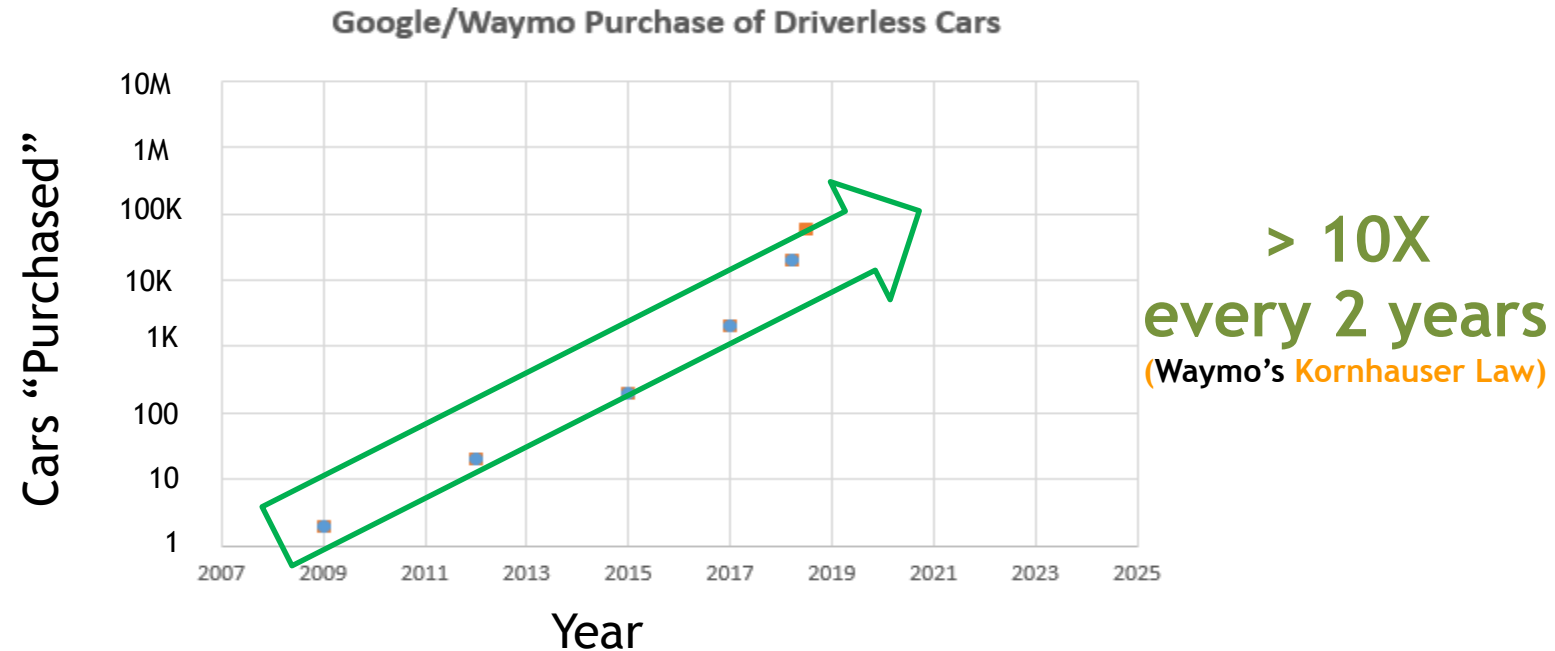


2018.2



Have You Noticed???

Google/Waymo's Buying Spree



2009



2012



2015



2017



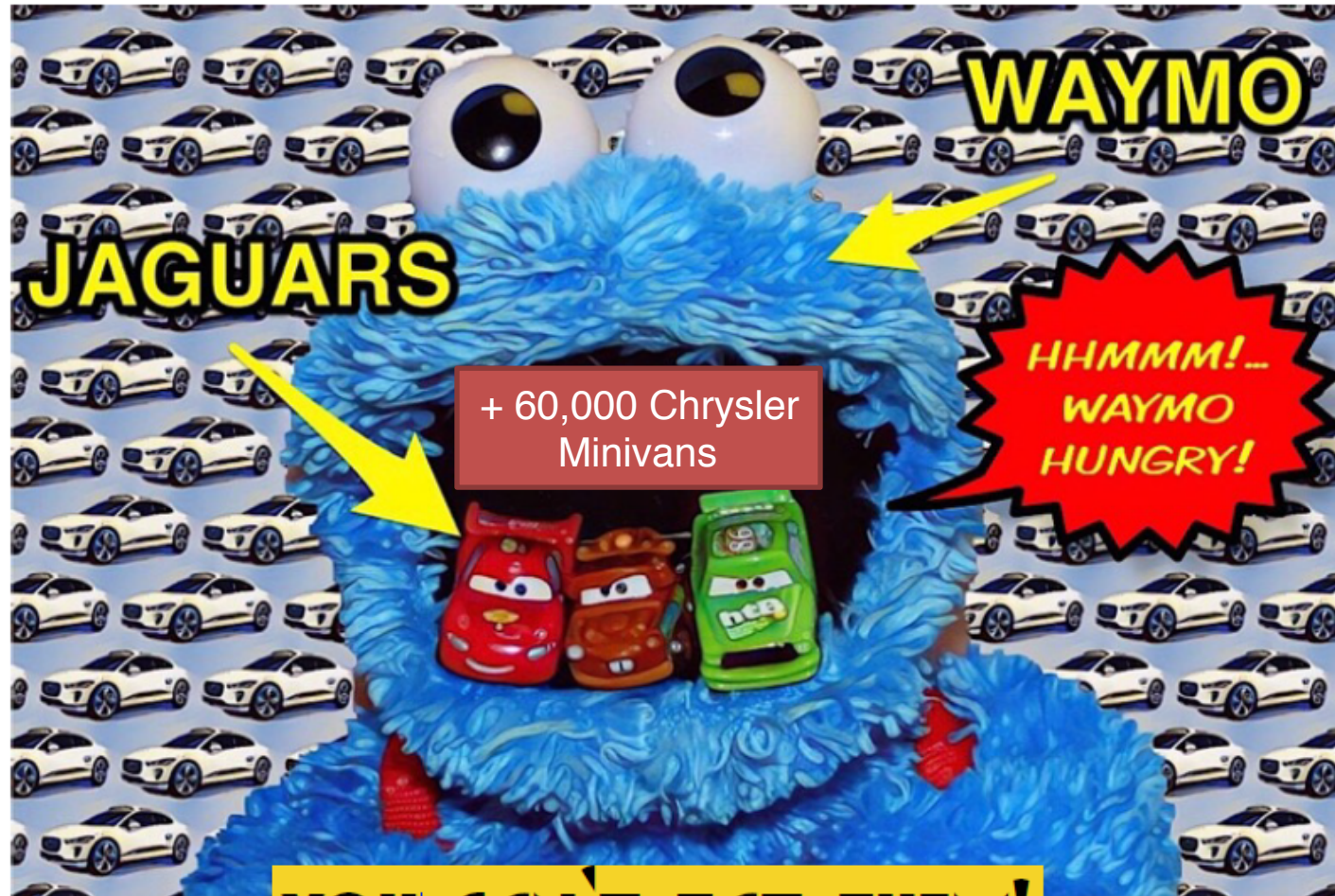
2018.2



2018.5



WHAT WILL WAYMO DO WITH 20,000 JAGUARS?



YOU CAN'T EAT THEM!

WHAT WILL WAYMO DO WITH 20,000 JAGUARS?



PROVIDE HOUSING FOR THE HOMELESS IN SAN FRANCISCO?

Where will Waymo Deploy 20,000 + 60,000 autonomousTaxis

- Maybe they'll “Geographically Market Test the aTaxi Mobility Experience”
 - Start by operating 1K in 20 different “cities”
 - Geo-fenced “communities of ~ 300,000” (serve 5% of personTrips)
 - Add 2K to 1st 20 (grow to 15% personTrip share) + 1K in 20 more “Communities of 300k



Where will Waymo Deploy 20,000 + 60,000 autonomousTaxis

- Maybe they'll "Spread the Mobility Experience"
 - operate 1K in 20 different "cities"
- How about "Central New Jersey" ?
 - Microcosm of USA
- Pop: ~300K
- Intra-area Trips/day: ~ 1.0M/day
- 1K aTaxis would serve ~ 5% personTrips
 - Focused initially on **Mobility Disadvantaged**
 - whose quality-of-life would be improved substantially!

