

LOCOMOTION



AUTONOMOUS CONVOYING PATH TO FULL AUTONOMY

ÇETİN MERİÇLİ, PH.D.
CO-FOUNDER & CEO

PAAV SUMMIT'19
POCONOS, PA
SEPTEMBER 05, 2019



TRUCKING FACING HEADWINDS



INDUSTRY

\$3T Industry WW (\$700B US)

70% of all goods consumed

Growing demand



CHALLENGES

Increasing driver shortage & turnover (up to 110%)

Razor thin profit margins (3-5%)

Low asset utilization



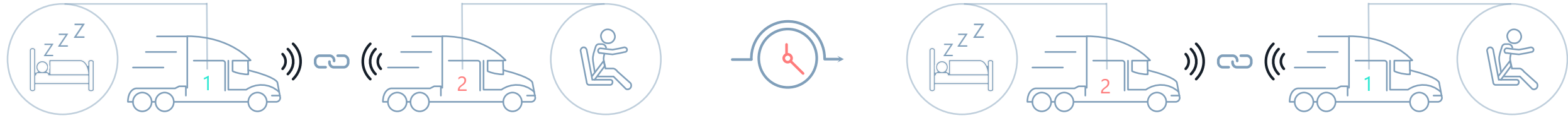
FULL AUTONOMY NEEDS MORE WORK

- System level V&V is inherently tedious/hard for highly complex systems
- Learning based components do not directly map onto V-model
- Generalized perception (machine learning) has fundamental open issues
 - Edge cases are challenging to enumerate and generalize over
 - Easy to demonstrate, hard to make bulletproof
- Brute forcing field testing is impractical with self-funding





FIRST STEP: AUTONOMOUS RELAY CONVOYING (ARC)



- Make a truck fully autonomous, but put it behind adult supervision
 - De-emphasizes long-tail perception problem (no ML required)
 - Enables natural and gradual progression towards full autonomy
- A very particular, narrow ODD
 - Easier to develop
 - More importantly, easier to validate
- Emphasizes motion planning, vehicle control, vehicle modeling
 - Not easy, but not an open science problem like generalized perception
- L4 capable hardware makes transition to higher automation levels smoother



MINIMUM VIABLE PRODUCT & MARKET SEGMENT

For-hire and Dedicated Fleets

- Line haul - Relay networks
- Team driving
- Day trips with backhaul
- >\$100B/yr market in US

Private Fleets

- Control over dispatching-schedule
- Team driving
- Relay networks

Ideal Starting Configuration

- Two truck convoys
- Easier to navigate around in traffic
- Less stress on infrastructure (bridges)



WRAP UP

- Autonomous convoying is a sweet spot to start
 - Addressing labor availability/costs => compelling ROI
 - Retaining human common sense in the loop
- Not a done deal
 - A lot of engineering challenges to get it right
 - Still, *easier* than taking the driver out of the cab at once
- Has a substantially shorter time to market

LOCOMOTION

THANK YOU!

www

<https://locomotion.ai>



@locomotionai



@locomotionai

