Autonomous Transportation & its implications

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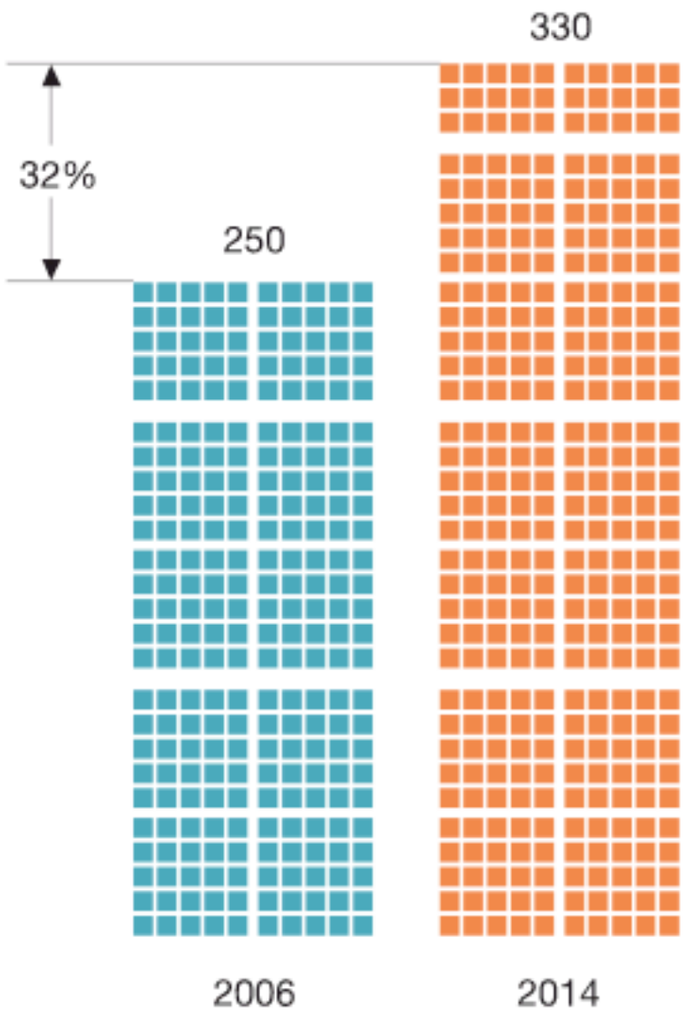
Outline

- Why Autonomous Transportation?
- The complex ecosystem surrounding autonomous vehicles and IoT:
    - Drone Delivery
    - Self Driving Cars
- Key Principles of Autonomous Transportation
- Challenges of Autonomous Transportation

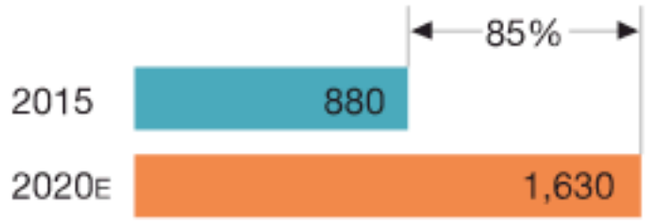
The case for autonomous transportation to ease burden of traffic in cities

Easing the burden of commercial traffic in cities will require new technologies, new business models, and new regulations.

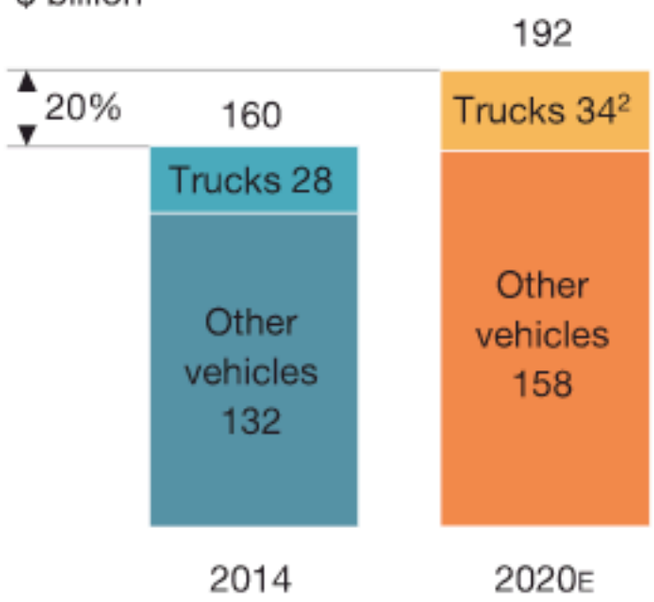
Number of commercial vehicles in use worldwide, million



E-commerce sales in the 20 largest e-commerce markets,[1] $ billion



Cause of urban congestion costs experienced by Americans, $ billion



[1]Adjusted for inflation.
[2]Assumes same split as 2014 of congestion costs between trucks and other vehicles.

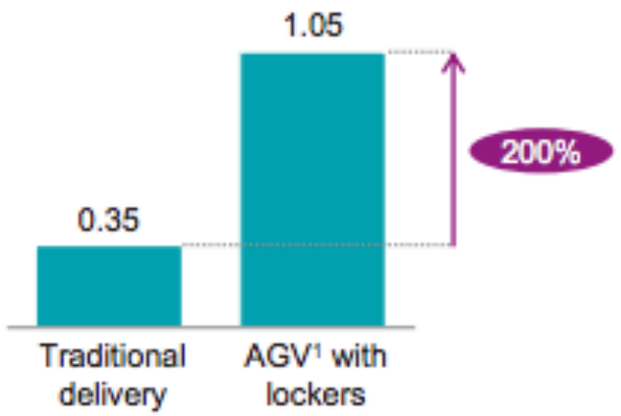
Source: "Number of passenger cars and commercial vehicles in use worldwide from 2006 to 2014," Statista, 2017; *2015 Urban Mobility Scorecard*, INRIX and Texas A&M Transportation Institute; McKinsey analysis

Why autonomous transportation in logistics?

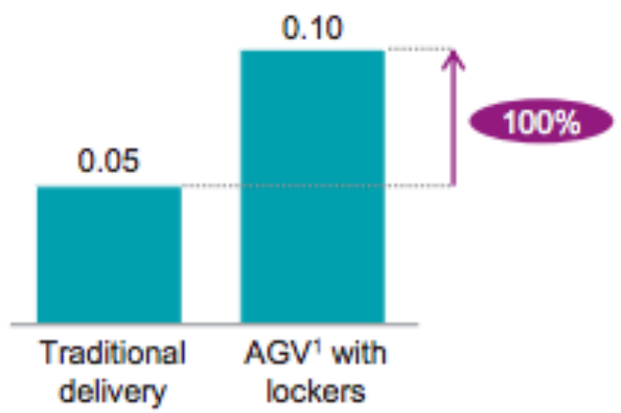
Autonomous ground vehicle lockers reduce the cost of delivery but increase mileage.

Developed, dense cities

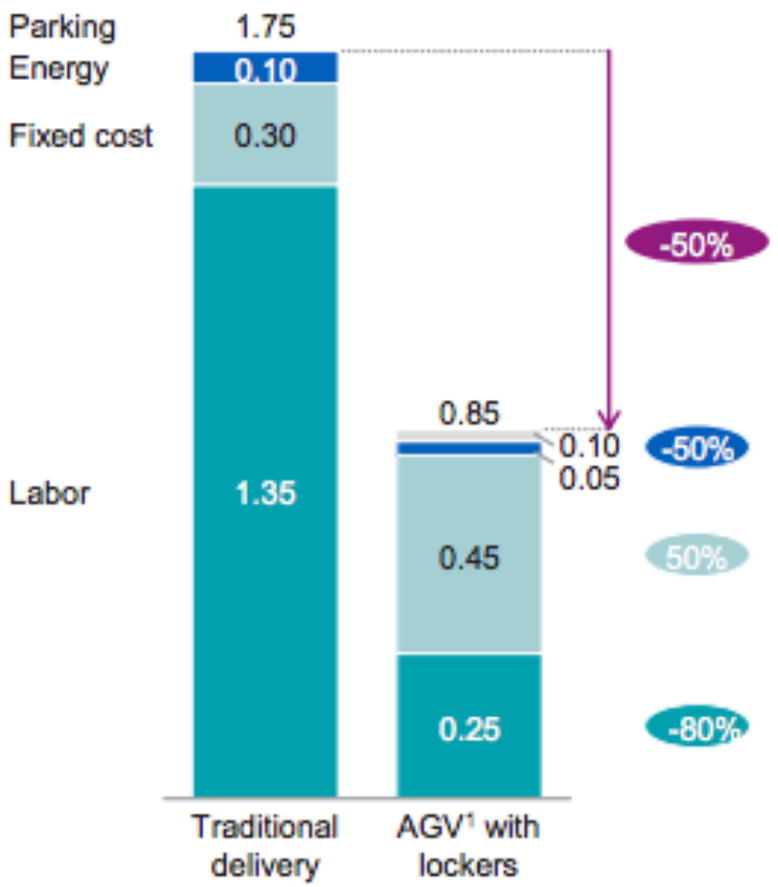
Mileage per parcel
km/parcel



Delivery time per parcel
hours

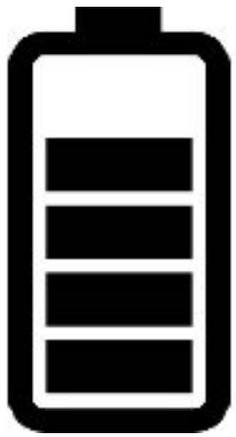


Delivery cost per parcel
$/parcel



1 Autonomous ground vehicle.

The best digital services often relied on the most boring parts in technology.



Not Enough Power

Network Access Failure

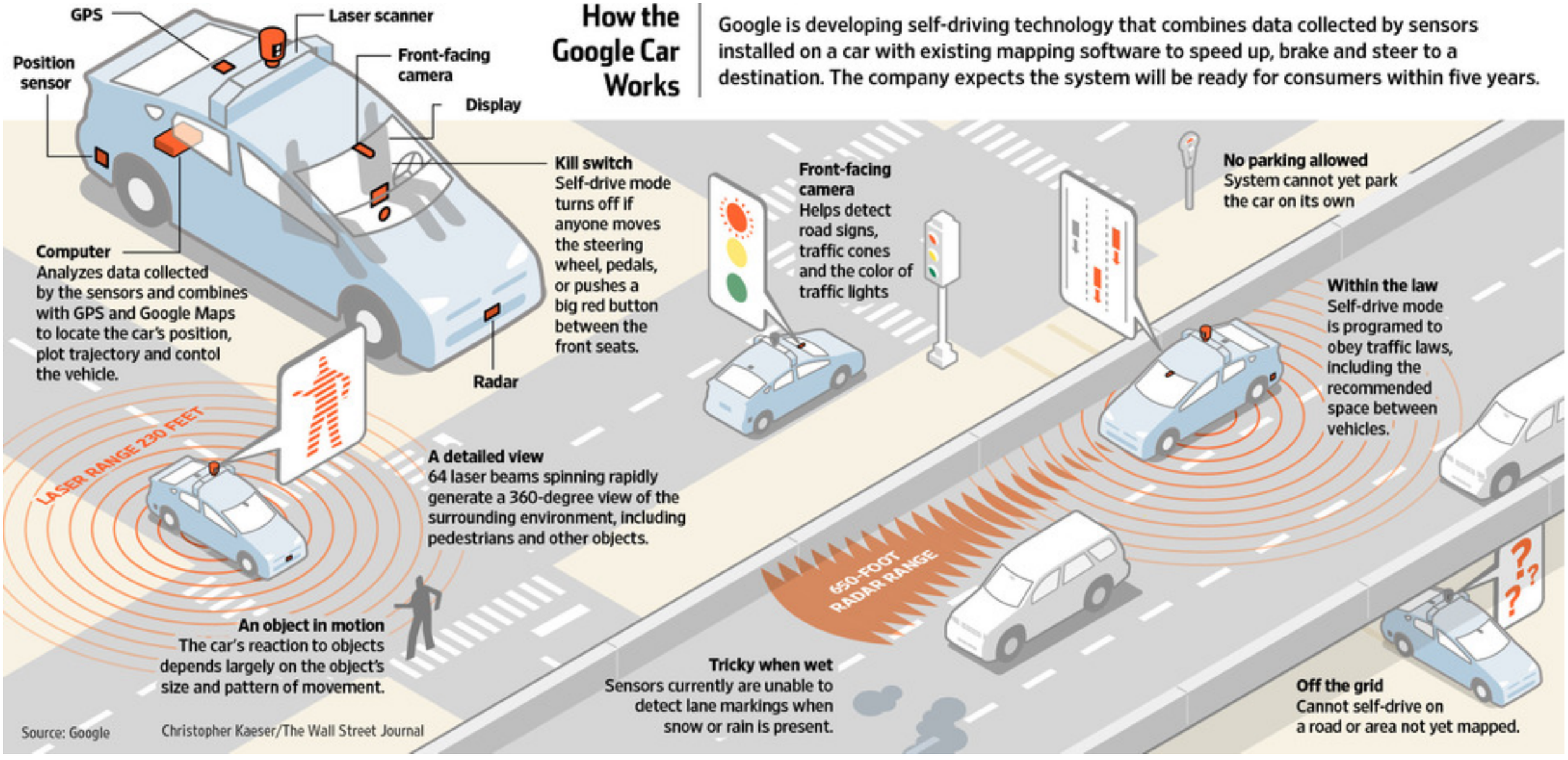
Lack of Nearby Signals

Loading Problems

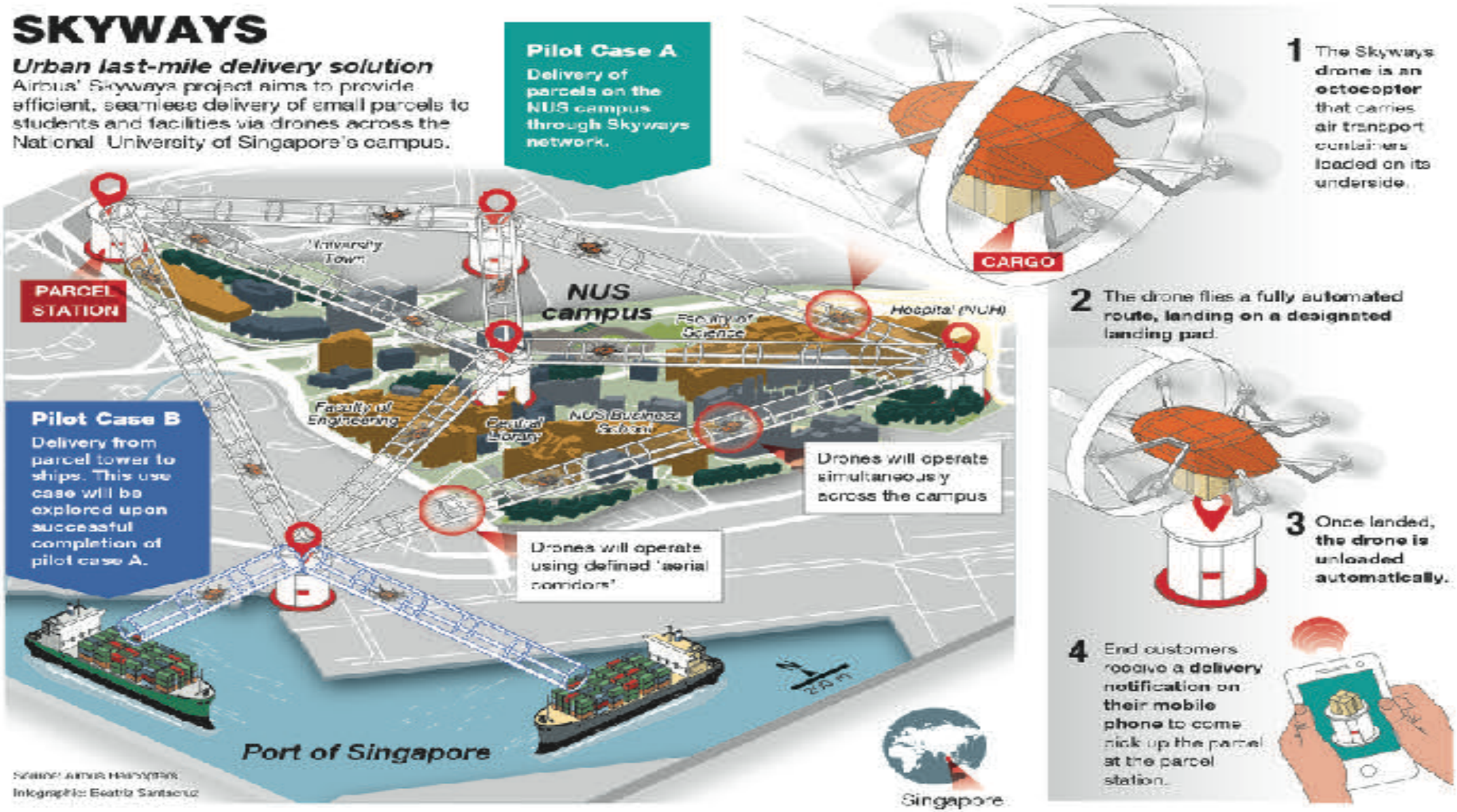
The Four Horsemen of Digital Apocalypse

A Self Driving Car is not an automobile but a communications & energy problem

The Complex Ecosystem with Self Driving Cars



The Complex Ecosystem with Drone Delivery and Parcel Lockers



Key Principles of Autonomous Transportation

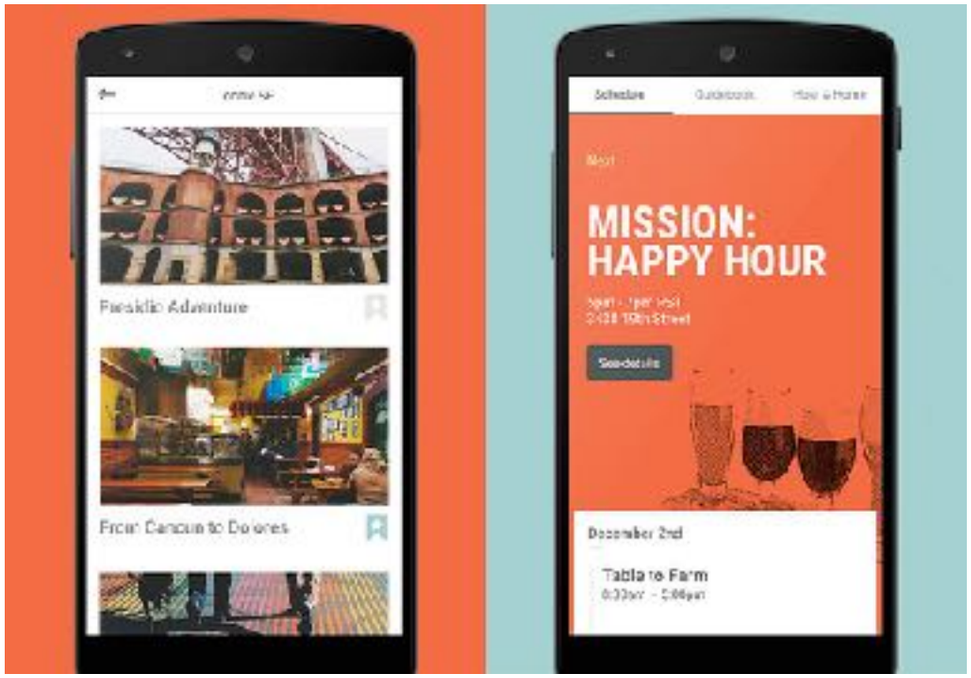
- The connected experience.
- Communication Networks.
- Open Data and APIs integration with government infrastructure.
- Cybersecurity on the IoT networks connecting the cars and infrastructure.

Connected Experience

- Frictionless and seamless experience from getting the transportation on demand.

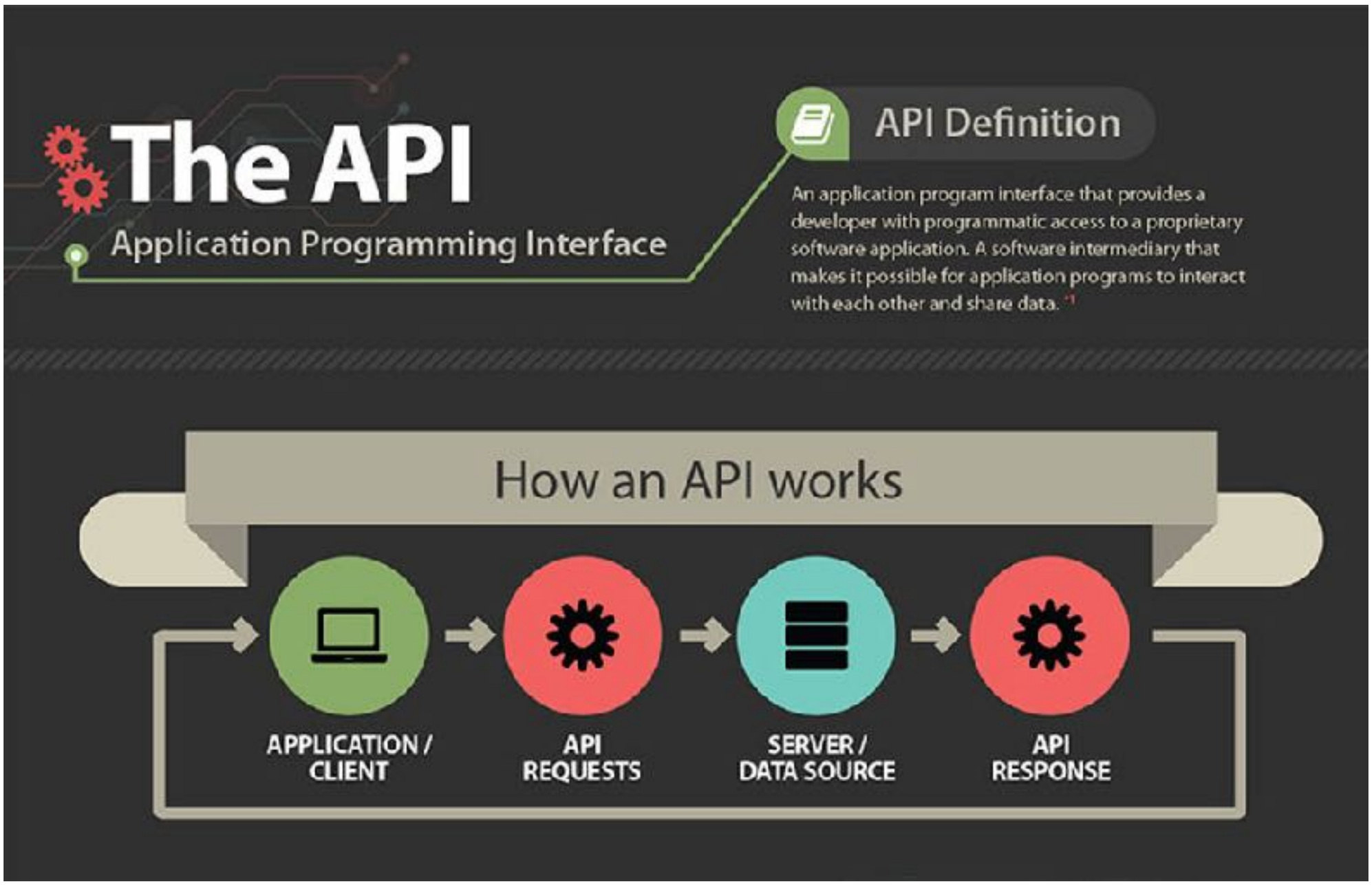
- Can the experience in transportation change with travel?

- What kind of known processes that autonomous transport can remove from the user?



Communication Networks

Open Data and APIs in government infrastructure



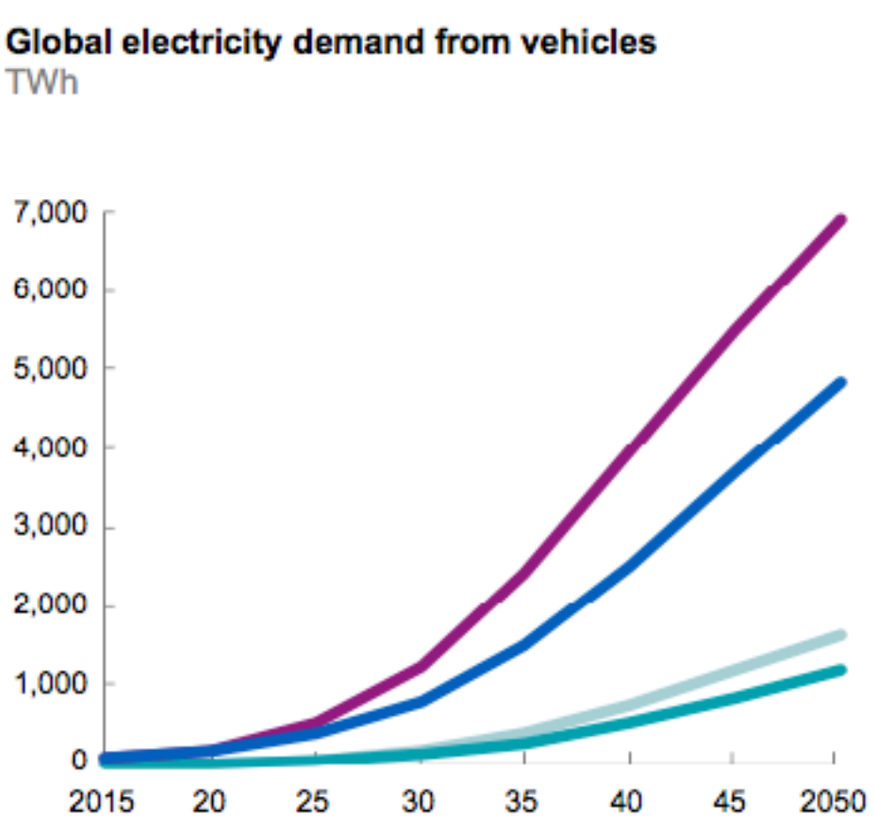
Cybersecurity

Urban Air Mobility

Challenges in Autonomous Transportation 1: Power Problem

Power demand of electric vehicles will depend on how quickly electrification happens.

Global electricity demand from vehicles
TWh



Electricity consumption by urban commercial vehicle (CV) (conservative)

Electricity consumption by other road transport (conservative)

Electricity consumption by urban CV (aggressive)

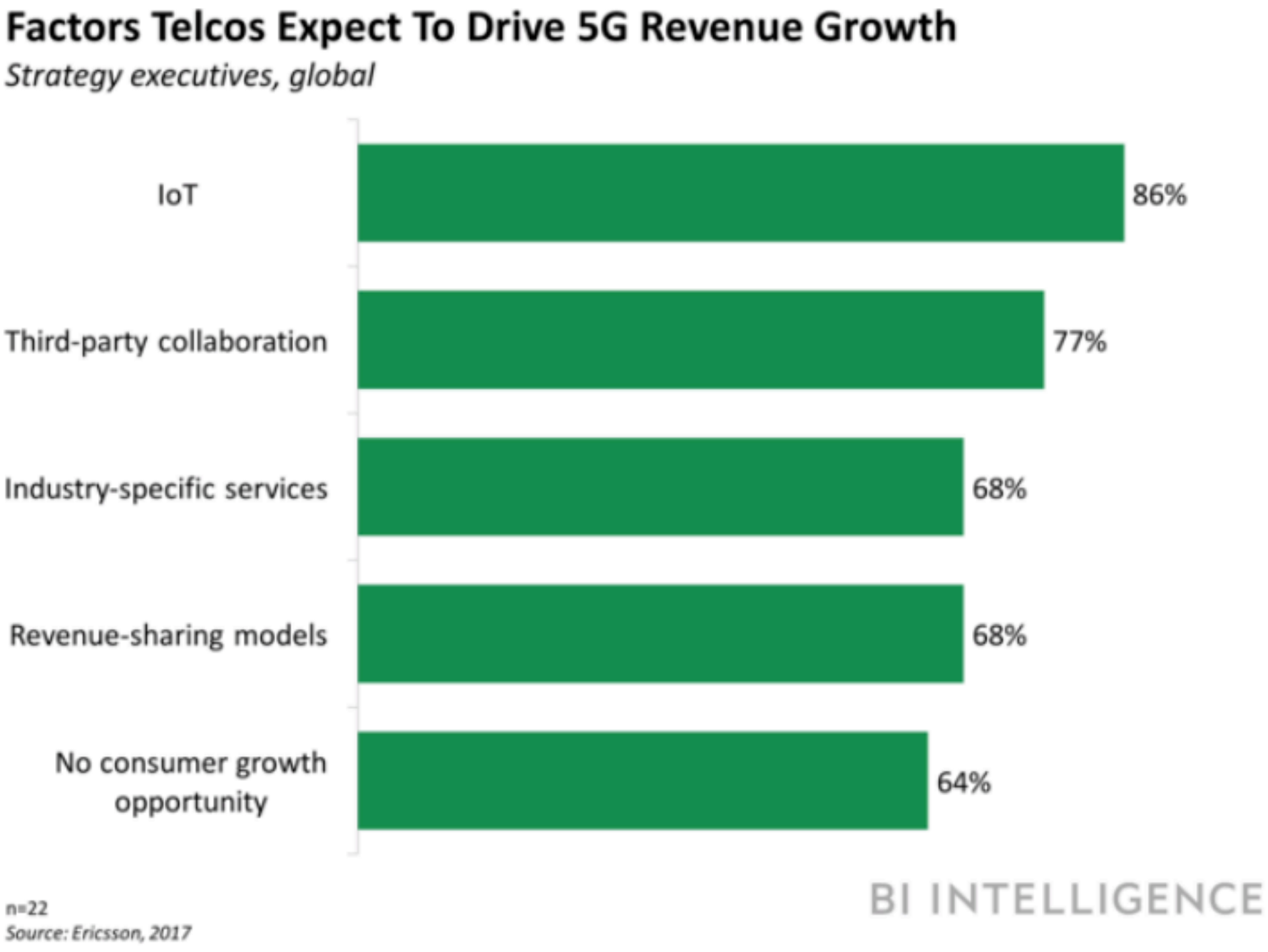
Electricity consumption by other road transport (aggressive)

Urban CV share of electricity demand

	2030	2050
Urban CV share of total global power demand	1–2%	3–5%
Urban CV share of total road transport power demand	14–16%	20–22%

Source: BNEF; McKinsey

Challenges in Autonomous Transportation 2: Communication Problem



BI Intelligence

Challenges in Autonomous Transportation 3: Government Regulation & Infrastructure

Mainly tie back to cybersecurity and safety for citizens

Key Summary

- Autonomous Transportation changes the way how we live and travel.

- The difference is that it requires a different configuration in how our cities and transportation systems are designed.

- Of course, with IoT, software and many technologies coming together, we might be living in a different world within the next few decades.

“We should be concerned about the future because we will have to spend the rest of our lives there.”
- Charles Kettering