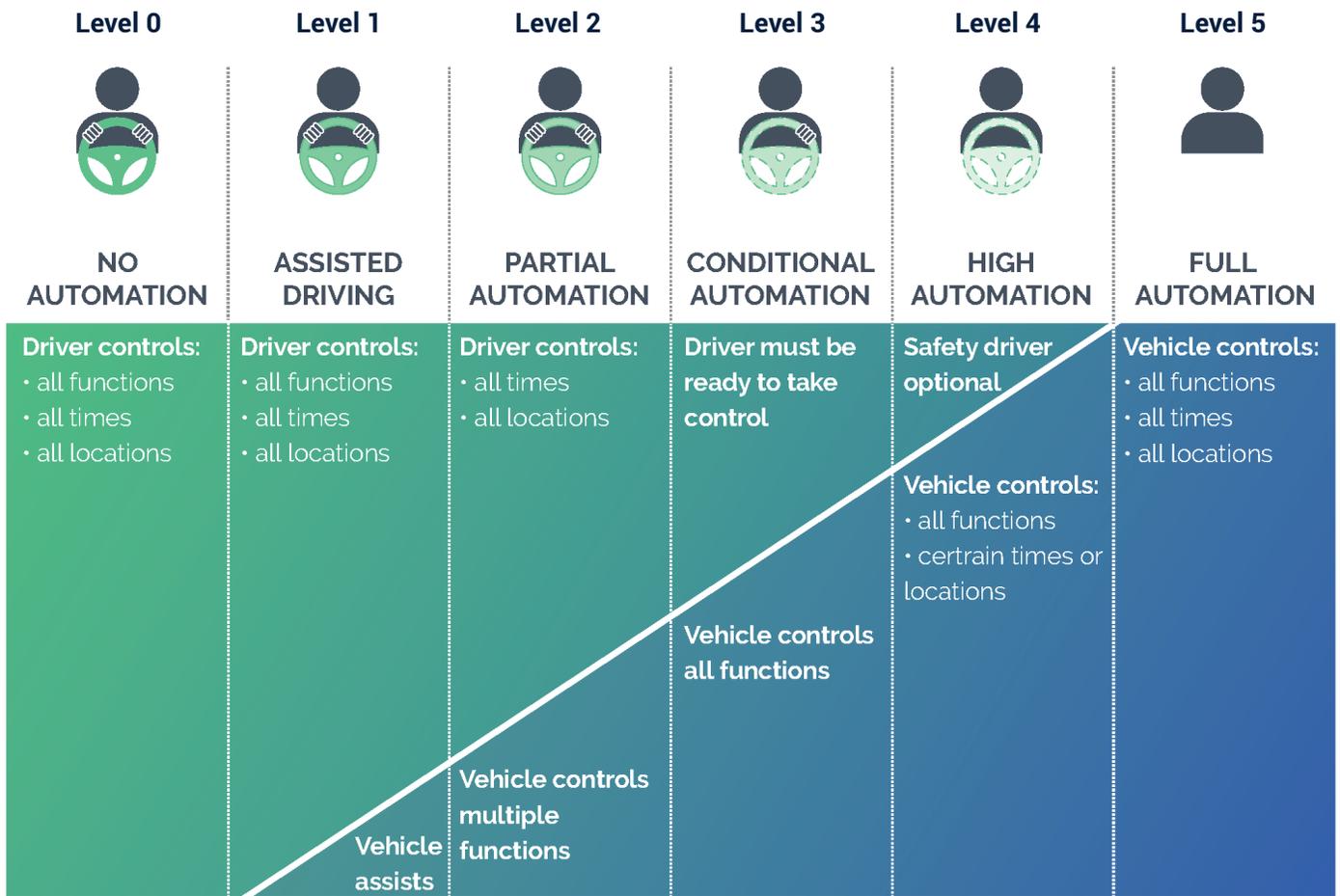


BackgroundInfo

Automated Vehicles: Levels of Automation

Automated Vehicles (AVs) use an array of sensors, powerful computers, and machine learning to navigate complex driving environments. With AV technologies, human operators and occupants will eventually be optional. This capability could have dramatic implications for personal mobility, public transportation, and the movement of goods. A standard framework created by the international Society of Automotive Engineers (SAE) defines basic steps in autonomous capabilities from no automation to full automation.



Source: SAE

Source: MTC, Autonomous Vehicles: Perspective Paper

What is Vision Zero?

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. First implemented in Sweden in the 1990s, Vision Zero has proved successful across Europe – and now it's gaining momentum in major American cities.

Source: Vision Zero Network

Stephen Buckley, P.E., AICP

Steve is passionate about ensuring automated vehicles (AVs) enhance the quality of life in our cities. Steve most recently served as General Manager of Transportation for Toronto. Prior to Toronto, Steve served as the Director of Policy and Planning for the Mayor's Office of Transportation and Utilities for Philadelphia. While in Toronto, Steve initiated and led a City divisional working group on AVs, commissioned the white paper "Driving Changes: Automated Vehicles in Toronto"; and initiated an AV Work Plan. Since then Steve has presented on over forty times occasions to agencies, academic institutions and conferences on planning for AVs.

Steve holds master's degrees in Transportation and in City Planning from the University of California – Berkeley, and his bachelor's degree in Civil Engineering from Syracuse University. Steve recently served as the Chair of the Transportation Research Board's Committee on Transportation Issues in Major Cities and is currently a lecturer in the University of Pennsylvania's City & Regional Planning program.

Roger Cohen

Roger is Senior Advisor to Pennsylvania Secretary of Transportation Leslie S. Richards. In this capacity, Roger is responsible for advancing high-priority initiatives of the Secretary and the Dept. of Transportation (PennDOT). He serves as co-chair of Pennsylvania's Autonomous Vehicles Policy Task Force, leading the state's vehicle automation initiatives. In 2017, AASHTO, the national organization of state transportation departments, honored Roger and the vehicle automation leadership team with its President's Award for Performance Excellence. In addition to vehicle automation, his recent areas of focus have been reducing the climate effects of the transportation system and evaluating funding alternatives for future infrastructure investment. Previously, Roger served as PennDOT Policy Director for nearly three years. A graduate of Columbia University in history and economics, Roger lives in Lancaster with his wife, Patricia O'Hara, a playwright and retired English professor at Franklin & Marshall College.

Dr. Megan S. Ryerson

Dr. Megan S. Ryerson is the UPS Chair of Transportation and an Associate Professor of City and Regional Planning and Electrical and Systems Engineering at the University of Pennsylvania. She was appointed Associate Dean for Research of PennDesign in 2018. She received her Ph.D. in Civil and Environmental Engineering from the University of California, Berkeley in 2010 and her B.Sc. in Systems Engineering from the University of Pennsylvania in 2003.

Dr. Ryerson's major contributions are in the field of transportation infrastructure planning and demand forecasting. Her work has investigated how airports compete for air service across megaregions, how airlines can reconfigure their disaster planning to achieve more resilient outcomes, and how flights can be planned more proactive to reduce fuel consumption. Overall, her work supports the design of transportation systems that are safe, efficient, and resilient. Dr. Ryerson is also focused on expanding the pedagogical reach of urban planning, and focusing on bringing megaregional and intercity transportation more squarely into the field of city and regional planning.

SpeakerBios

Sarah Clark Stuart

Sarah is Executive Director of the Bicycle Coalition of Greater Philadelphia, a member-driven non-profit regional advocacy organization. In 2004, Sarah played a leadership role in the three-year "Free Schuylkill River Park" campaign to preserve public access to the Schuylkill River Trail in Center City, now known as Schuylkill Banks. Since joining the Bicycle Coalition in 2006, she has been a key player in the Bicycle Coalition's key accomplishments: the \$23 million TIGER trail-building grant; naming and building out the Circuit; lobbying successfully for legislation mandating the inclusion of bike parking in new construction projects and codifying Philadelphia's Complete Streets policy; and advocating for the development of Philadelphia's Vision Zero Action Plan and creation of the City's Complete Streets Office.

Sarah has held positions with the Pew Charitable Trusts and Environmental Defense Fund, and consulted for the Conservation Law Foundation and the Natural Resources Defense Council. She holds a Master's of Forest Science from the Yale University's School of Forestry and Environmental Studies, and a bachelor's degree from Pomona College. Sarah is a mother of two daughters and resides in Center City Philadelphia.

Samuel I. Schwartz, P.E.

Mr. Schwartz is President, and CEO of Sam Schwartz Transportation Consultants, a firm that specializes in transportation planning and engineering. In 1980, during the New York City transit strike, he released the word gridlock to the lexicon. Consequently, he is known throughout NYC as Gridlock Sam and pens an eponymous traffic column in The New York Daily News.

Previously Mr. Schwartz was New York City's Traffic Commissioner and was the Chief Engineer of the NYC Department of Transportation. He started his transportation career in the late 1960's as a NYC cabbie and joined the Traffic Department, as a junior engineer, in 1971. Mr. Schwartz's most recent books, *Street Smart: The Rise of Cities and The Fall of Cars* (2015) and *No One at the Wheel: Driverless Cars and the Road of the Future* (2018) lay out a recipe for cities faced with rapid changes in modes, automation, demographic shifts and travelers' preferences.

Mr. Schwartz has been an adjunct professor for 40 years at some of New York City's most respected colleges and universities including Cooper Union, Long Island University, Hunter College and Brooklyn College. He obtained his Bachelor of Science degree in Physics at Brooklyn College and received a Master of Science degree in Civil Engineering at the University of Pennsylvania. He is a licensed Professional Engineer in New York, New Jersey, Pennsylvania, Connecticut and Florida.

Kelley Yemen

Kelley is Director of Complete Streets for the City of Philadelphia with over ten years of experience in city and regional planning focusing on multi-modal transportation. She works to assure that all street projects, programs, and maintenance incorporate concepts and strategies that promote safety across all modes of transportation and leads the City's Vision Zero and Complete Streets efforts. Previously, Kelley worked as the Pedestrian and Bicycle Coordinator for Hennepin County, MN, as a Pedestrian Planner and Project Manager within the Office of Bicycle and Pedestrian Programs at the NYC DOT, and as a Urban Designer for A. Nelessen Associates in NJ.

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How Will Automated Vehicles Affect Vision Zero?

Strength In Numbers

High degrees of collective action and political will attempts to give citizens more say in the development and regulation of technology, their communities, the economy, and privacy. A slowdown in innovation puts more focus on deploying already existing technologies.

Underlying Forces:

- ▶ New technologies emerge slowly: electric vehicles, connected vehicles, automated vehicles (Level 4), smart cities (public sector-led), Internet of Things¹, microgrids, 3-D printing, nanotechnology.
- ▶ Proactive efforts to slow climate change, proactive resiliency measures, and clean energy.
- ▶ Government led efforts to provide more affordable housing.
- ▶ Climate change, refugee crises, uprisings, food shortages, rising authoritarianism, and terrorism increase population movement.
- ▶ Increasing e-commerce reduces demand for bricks and mortar retail space and puts more small trucks on the road to deliver packages.

¹ Internet of Things embeds sensors into everyday objects to capture and exchange data and in some instances performs remote actions.

Federal Officials Investigate Truck Platoon-related Crash on NJ. Turnpike

The Future Investigator | October 17, 2024

MT. LAUREL, NJ—Federal officials are investigating a fatal crash on the New Jersey Turnpike near Mt. Laurel, in which a vehicle struck the off-ramp divider. The presence of a truck platoon (a group of connected trucks traveling in a convoy with a lead driver) in the immediate vicinity at the time of the crash, has triggered a U.S. DOT automated vehicle, or A.V., crash investigation, as mandated under the 2022 Safe Connected and Automated Trucks and Vehicles Act (SCATV Act). The SCATV Act sets tough standards for highly automated vehicle (HAV) safety and performance which must be satisfied before granting any commercial licensing. The SCATV Act's creators made a strategic decision to focus on freight automation, which impacts fewer people, before approving the technology's use with the wider public.

Witnesses spoken to at the scene asserted that the driver's attempt to overtake the four-truck platoon in order to reach the exit caused the incident. The crash is renewing calls for Trenton to revisit legislation passed

in 2023 permitting four-truck platoons on New Jersey highways.

A major driver behind the SCATV Act was the exponential rise of e-commerce, resulting in ever-increasing demand for truck delivery which continues to strain the nation's roadways. There would be even more trucks on the road, if there were enough drivers for them. The trucking industry, in partnership with the Federal government and many state governments, continues to push forward on trucking platoons as a longer-term solution to the shortage of truck drivers.

"We believe the benefit of these regulations is that they will help to ultimately achieve the vision for a safe, equitable, and low carbon transportation network," said Natalie Whiteside, a spokesperson for U.S. DOT. Nevertheless, critics contend this regulation-heavy approach is slowing down potentially life-saving technologies.

In less than two years since the passage of the SCATV Act, commercial truck platoons are becoming a routine sight on the nation's

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highways. The Act provided grants to acquire and develop autonomous truck ports near highway entrance and exit ramps. Many states have begun increasing the allowable number of trucks that can join into a platoon and some, including New Jersey, have gone as high as four trucks to a single platoon.

Critics contend that allowing longer platoons will increase safety risks. These fears are borne out in crashes like the one yesterday. Even as vehicle safety advances, the changing vehicle types and uses create new safety challenges. This crash is another illustration of why U.S. DOT's slow walk AV roll-out of automated trucks and vehicles may not be a bad thing. ◆

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How Will Automated Vehicles Affect Vision Zero?

Delayed Expectations

Polarization, political uncertainty, slow innovation, and lack of direction lead to economic stagnation. Long-anticipated technologies have been slow to roll out after hitting a few bumps in the road.

Underlying Forces:

- ▶ New technologies emerge slowly: electric vehicles, Level 2 automated vehicles, smart cities (private sector-led), Internet of Things¹, 3-D printing.
- ▶ Climate change. Response to it is largely reactive.
- ▶ More socioeconomic inequality & reliance on market built housing.
- ▶ Public health worsens due to increasing inequality, failure to treat chronic diseases at their root causes, and climate change induced disease migration.
- ▶ Climate change, refugee crises, uprisings, food shortages, rising authoritarianism, and terrorism increase population movement.
- ▶ Increasing e-commerce reduces demand for bricks and mortar retail space and puts more small trucks on the road to deliver packages.

¹ Internet of Things embeds sensors into everyday objects to capture and exchange data and in some instances performs remote actions.

Bicyclist Fighting For Her Life after Run-In with Faulty Automatic Braking System in Schuylkill Yards

The Future Investigator | May 13, 2023

PHILADELPHIA, PA—A university student was struck while biking on West Market Street in the Schuylkill Yards district. A police investigation is ongoing, but preliminary reports suggest the crash was triggered by a faulty automatic braking system (ABS), which caused a Level 2 automated vehicle, or AV, to stop suddenly. The abrupt stop caused the bicyclist, who was traveling behind it, to collide with the vehicle and she was thrown into the path of a conventional (non-AV) vehicle in the adjacent lane. The bicyclist was taken to the University of Pennsylvania Hospital with life-threatening injuries.

The auto industry has long touted the expected safety benefits of AVs, but the reality is the technology is only slowly filtering into the market. Today's vehicles come equipped with a variety of safety features, including advanced driver assistance systems—lane centering and adaptive cruise control, pedestrian detection and blind spot monitoring—along with

automated emergency intervention systems, which perform emergency braking if the vehicle detects a collision is imminent. These systems have been mandatory on new vehicles since 2022. But the day when you can get in a self-driving car and have it take you to wherever you want to go remains decades away.

But while this technology has helped to lower crash rates overall, new types of crashes have been occurring due to sensor failures and high-speed reaction times. Recent tests by *Car and Driver* magazine found that ABS are still having a hard time reacting at higher speeds and have struggled with functionality across systems, such as overtaking adaptive cruise control when it is active, their sensors have their own blind spots, they struggle when the sun is shining directly at them or a nearby vehicle, and they still have false negatives—where they stop for no reason. Police suspect that this was at play in yesterday's crash.

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Growing demand for the region's principal transportation hub at 30th Street Station is adding up to a crisis for both safety and congestion around Schuylkill Yards, which is one of the region's principal job centers. Throughout the day, many rush to catch trains or a shared vehicle, electric scooter, bike, or moped. Others hail a ridesharing service. The lucky ones keep their commute short by living and working in the district. This still leaves a large number who get in their car and navigate the increasingly chaotic streets. Even with all these options, the area suffers from severe transportation challenges that many thought technology would have stamped out by now.

"I think we've been a little lax with development decisions, particularly with regards to density and parking, with the belief that technology would let us innovate our way out of congestion challenges," says University of Pennsylvania professor Garrett Dwyer. It's not that there hasn't been any technological progress as the Yards area has built up, the problem is that there are more and more modes competing for scarce street space and operating at a variety of speeds. "The area looks like what normally would be associated with a city in the developing world," complains area commuter Ericka Olanyan, "It's no wonder that crashes like this are occurring."

"So much hope was put into the autonomous vehicle," says Dwyer, "and we let our imaginations run wild about what it would mean, and how we could do things differently." Yet, Philadelphia—a city designed long before the advent of the automobile—has struggled to keep its facilities wired to the specific needs for each new mode as it emerges.

Meanwhile, a fully autonomous future seems to be receding further and further into the horizon. The huge expenditures that many auto manufacturers and tech companies bet on artificial intelligence haven't paid off. More than a few have already gone into bankruptcy as a result. Many others have shut down their AV operations. Those are that still remaining, hope to get the Federal government more involved in funding future research. But this seems unlikely, given ongoing austerity measures. As a result, it's difficult to see an easy way out of the traffic mess around Schuylkill Yards and the fulfillment of the city's Vision Zero goals. If AVs aren't going to be a silver bullet for road safety, the region needs to increase its commitment to safety so we don't have more bicyclists with life threatening injuries when technology goes awry. ◆

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How Will Automated Vehicles Affect Vision Zero?

Technopolitical Transformation

High degrees of collective action and political will attempts to give citizens more say in the development and regulation of technology, their communities, the economy, and privacy. An activist public sector is trying to direct fast moving technological advances toward achieving major societal goals.

Underlying Forces:

- ▶ Technology convergence (where the sum of the whole is greater than any individual technologies on their own): electric vehicles, connected & highly automated vehicles (Level 5), smart cities (public sector-led), Internet of Things¹, microgrids, digital fabrication, smart robotics, Artificial Intelligence, augmented reality, nanotechnology, gene therapy / gene editing.
- ▶ Increased willingness to travel.
- ▶ Proactive efforts to slow climate change and undertake proactive resiliency measures, and clean energy.
- ▶ Societal efforts to provide more affordable housing, improve education, provide jobs.
- ▶ Climate change, refugee crises, uprisings, food shortages, rising authoritarianism, and terrorism increase population movement.
- ▶ Increasing e-commerce reduces demand for bricks and mortar retail space and puts more small trucks on the road to deliver packages.

¹ Internet of Things embeds sensors into everyday objects to capture and exchange data and in some instances performs remote actions.

Robotic 'Road Butlers' To Be Deployed to Crash-Prone North Philadelphia Neighborhoods

The Future Investigator | October 17, 2026

PHILADELPHIA, PA—The City of Philadelphia will be deploying a fleet of robotic “Road Butlers” to select neighborhoods in North Philadelphia where crash rates remain stubbornly high, despite strides elsewhere in the City’s Vision Zero efforts. Road Butlers are large, municipally owned robots that work to keep vehicles from stopping in through traffic lanes, stop cars from blocking intersections, help travelers understand new travel options, guide pedestrians to where it is safe to walk, and reroute vehicles during emergencies and special events. They have several cameras embedded in them that can be used to monitor traffic conditions. The goal is to maintain a safe, orderly flow of traffic amid the proliferation of new automated (AVs) vehicles hitting the roads.

Some of the new self-driving vehicles to hit the streets in just the last year include “delivery bots” (small robots that travel along sidewalks at slow speeds, often delivering just a single package); “self-balancing automated scooters” (devices on two-wheels that can’t be knocked over even when rammed at high speeds); “automated shuttles” (10-12 passenger

shuttles that offer service in a loop that connects to mainline transit rail and bus rapid transit services); “automated pods” (single passenger microvehicles that can be hailed on demand or at a transportation hub); “self-driving e-bikes;” and many others. All have been programmed with a high-level of cautiousness and courtesy as a result of federal government directives and standards. Most AVs are shared through transportation network companies or utilized for deliveries by courier network services.

The widespread adoption of these new transportation options is credited with rapidly falling crash rates nationwide, including in the Philadelphia region. Yet in some of Philadelphia’s most crash-prone neighborhoods—which are also generally low-income and home to minority populations—crashes have dipped but not seen the precipitous fall seen in wealthier, whiter neighborhoods. “Where they are common, self-driving vehicles have done wonders for Vision Zero efforts,” explains Joan Farley, Philadelphia’s Director of Vision Zero Programs. “The problem is where there isn’t a strong market for them; we’re looking

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at a largely pre-2025 vehicle mix and the same lack of funding for the infrastructure investments needed to make those streets safer."

This wasn't how it was supposed to be. The 2022 Accelerating the Deployment of Automated Passenger-vehicles and Trucks (ADAPT) Act set strong standards for the reduction of fatalities and greenhouse gas emissions from the transportation sector. The Act has helped to leverage the considerable private market dollars in the space. It committed to building out a dedicated short-range communications (DSRC) network that helps vehicles talk with other vehicles, infrastructure, and other things. It set ambitious goals to reduce both roadway fatalities and greenhouse gas emissions to zero. It developed a certification process that includes putting automated vehicle hardware and software through objective safety criteria, simulations, road tests, and third-party review. The ADAPT Act aimed to improve communications between HAVs and human road users, and stipulated standards to ensure vehicles would recognize road users regardless of race, height, clothing type, or physical ability.

While not picking a specific technology or mode, the ADAPT Act has helped the U.S. DOT guide innovation. Rather than using automated technologies to simply upgrade the car, the federal government

has sponsored a series of challenges to see how transportation and vehicles can be reinvented to better meet human needs. "We're seeing the fruition of these efforts now through an emergence of all kinds of new self-driving, low-emission vehicles," says Federal Highway Administration Connected Automated Vehicle Program Manager Deyvris Gonzalez. "One of our primary goals is to work collaboratively with citizens to help understand their concerns with the technology and improve their comfort with it."

Unfortunately, so far outcomes have been uneven. Many in low-income and disinvested areas, including both urban and rural areas, say these investments and technologies have yet to benefit them, particularly as DSRC investments has lagged in these areas. Residents have a harder time affording the new technologies, and on-demand service providers have been slower to arrive in lower-density locales with less demand. Better staffed large cities have had the resources to leverage the ADAPT Act into better municipal outcomes, leading to safer and less expensive transportation options; while some of the communities that need it most are the ones behind the adoption curve, leading to equity concerns. It remains to be seen how Philadelphia can address this and if the Robot Butlers are the key to solving the high crash rates in North Philadelphia. ♦

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How Will Automated Vehicles Affect Vision Zero?

Technology in the Driver's Seat

The private market has increasing control over technology development & deployment, the economy, and how communities grow and develop. Automation has upended work, transportation, and many other industries, leading to considerable worker displacement.

Underlying Forces

- ▶ Technological Convergence (where the sum of their whole is greater than any individual technologies on their own): electric vehicles, highly automated vehicles (Level 5), smart cities (private sector-led), Internet of Things¹, digital fabrication/3D printing, smart robotics, Artificial Intelligence, augmented reality, nanotechnology, electric vertical take off and landing (eVTOL) vehicles, self-piloting drones, and cryptocurrency.
- ▶ Concentrated power in large organizations through network effects² and winner-take all economics, Big Data³, and artificial intelligence.
- ▶ Increased willingness to travel.
- ▶ Climate change with reliance on technological solutions, and reactive resilience measures.
- ▶ Waste disposal crisis from lack of recycling a steadily increasing material flows, particularly e-waste.
- ▶ More reliance on market-built housing, no significant changes to education or job (re)training.
- ▶ Climate change, refugee crises, uprisings, food shortages, rising authoritarianism, and terrorism all increase population movement.
- ▶ Increasing e-commerce reduces demand for bricks and mortar retail space and puts more small trucks on the road to deliver packages.

¹ Internet of Things embeds sensors into everyday objects to capture and exchange data and in some instances performs remote actions.

² Network effects are where the more people that use a service, the more valuable it is.

³ Big Data are datasets so large they can't be analyzed with traditional data processing techniques.

Ready or Not, the Autonomous Vehicle Gold Rush Arrives in Philadelphia Region

The Future Times | February 13, 2022

COLLINGSWOOD, NJ - The latest round of transportation innovation has hit the region's streets as Chinese auto manufacturer DrivePower becomes the fifth company with commercially available Level 4 highly autonomous vehicles (HAVs). Level 4 HAVs have an operational design domain (ODD) that specifies where the vehicle can operate in self-driving mode. Each manufacturer has a different ODD, but they are largely on limited access highways and major arterials, and in good weather conditions. A number of manufacturers, including all of those currently offering Level 4 HAVs, promise full self-driving cars that can go anywhere within two years.

While DrivePower faces stiff competition from other early movers, bigger questions remain about what this means for Greater Philadelphia's fast changing transportation ecosystem. In the rush of new vehicles, the public has had little opportunity to weigh in on their wants and needs, or to help to shape this newly emerging transportation system. While a number of companies are rushing HAVs to the marketplace, "it is the ones that are taking this slower who are being more cautious

about safety," says Robyn Caroline, president of the non-profit Roadway Auto and Safety Advocates (RASA).

"I'm still not comfortable with them," says Cinnaminson, NJ resident Barbara Spencer. "I saw one going south on 130 last week. Its backup driver wasn't paying any attention. It stopped at first, but then when I started to cross the street, it started going as well. Fortunately it quickly stopped again. How is a person supposed to communicate with these cars?"

While AVs are highly popular with those who own them, there are others who feel quite differently. AV detractors are voicing dissatisfaction over rise of artificial intelligence (AI), ceding control to machines, and concerns about safety and job losses in a number of ways. There are now hundreds of examples of people pelting rocks at AVs, running them off the road, screaming at them, even threatening their human occupants – with weapons in a handful of cases.

While there are a number of viral Internet videos that show various Level 4 HAVs

BreakingNews

steering themselves out of impending danger, just as many highlight the risks of handing control back to drivers when the vehicle encounters a situation it can't handle. A number of crashes have already occurred in these situations across the country, with several fatalities. One of the problems appears to be that drivers trust the technology more than HAV developers intended. Drivers are supposed to be ready to take control of the vehicle at a moment's notice when it is in self-driving mode. However, many other Internet videos attest to drivers doing many other things—from watching movies to working—instead of paying attention to the road.

Also disconcerting was the recent first crash between two actively self-driving vehicles, with one death. Investigators are still looking into the causes of this crash. That hasn't stopped speculation that it could be the result of sensor failure, the difficulty of reading and predicting different operating systems, or a bug in the software.

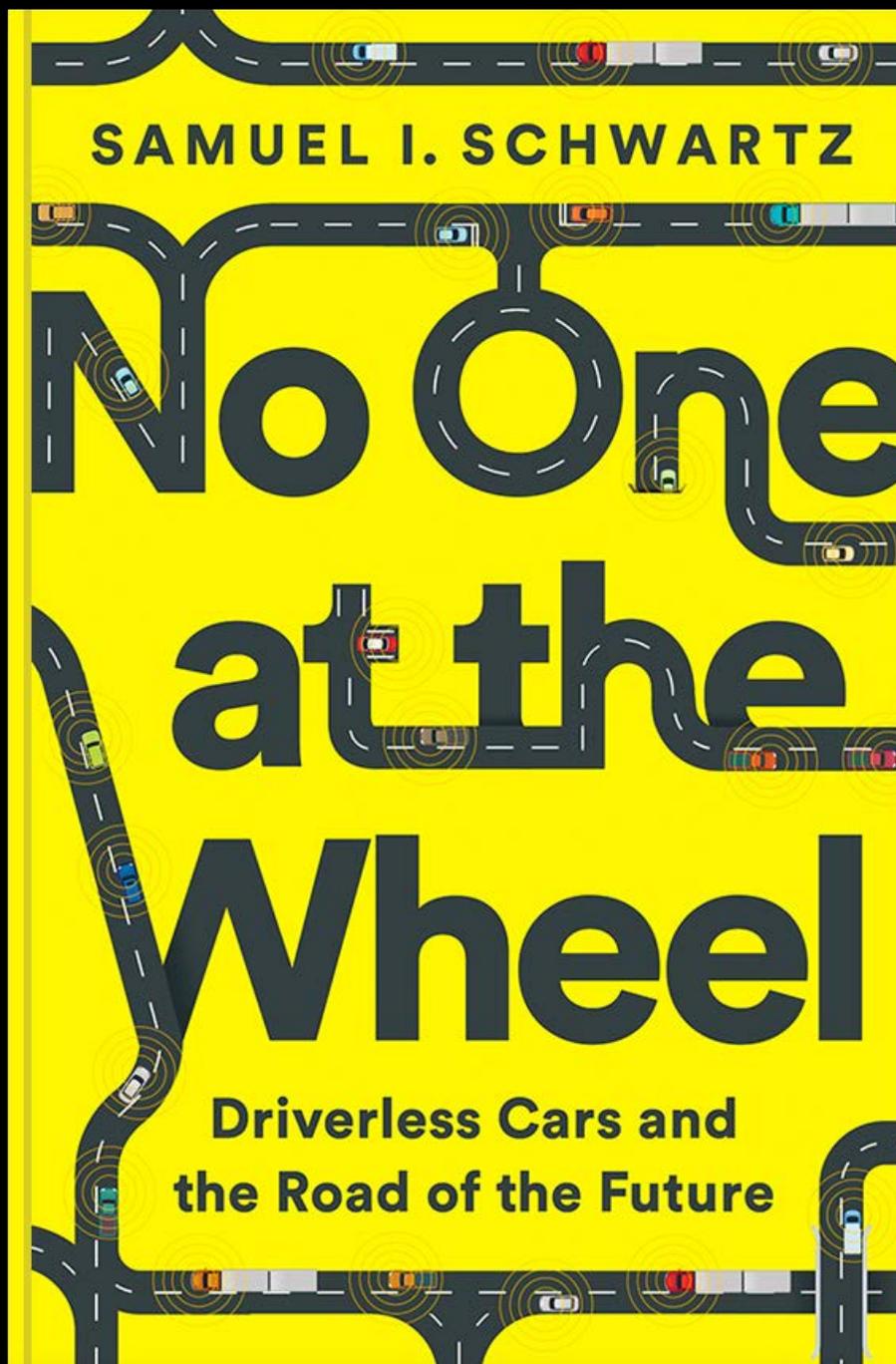
One of the concerns echoed by RASA's Caroline is that these vehicles were tested on roads with human drivers, but rarely, if ever, with other HAVs. But it's hard to verify this, since none of the manufacturers are sharing data, and there are no regulations that compel them to do so. Joe King, spokesperson for the National Highway Traffic Safety Administration, disputes any notion that the agency's policy for voluntary reporting standards is insufficient. "This technology

will save tens of thousands of lives each year, and we shouldn't throw up hurdles that slow it down."

One thing that could improve safety would be to require vehicles to be connected wirelessly so they could communicate more information than can be captured by on-board sensors. Had the two HAVs that crashed this week been communicating and cooperating, there may be one less roadway fatality today.

Even as AVs are overtaking the nation's roads, the next disruptive technology, electric vertical take-off and landing (eVTOL) vehicles, is on the horizon. Many predictions suggest these vehicles could become commonplace within the next decade. These vehicles may have a built-in advantage: they don't have to rely on crumbling roads and bridges to get around. In the meantime, many hope that HAV manufacturers strive to improve their safety capabilities.

In a scene reminiscent of the first iPhone, HAVs continue to fly off car dealer lots—despite their challenges and high prices. One early buyer, Jamar Nolan, says he wanted a HAV so he could relax during his long commute, more routinely visit his aging parents in Mays Landing, NJ, and looks forward to the day where he can send it out to run errands. "It's a real stress reliever for me and it gives me time back during my long commute," he says. ♦



SAMUEL I. SCHWARTZ

No One at the Wheel

**Driverless Cars and
the Road of the Future**

Samuel I. Schwartz, P.E.

DVRPC Safety/Futures Group

June 19, 2019

Zap

FOR THE UNEMPLOYED

ALBERT
HORAN
BAILIFF

PARKING 25

FREE SOUP
&









1911







Super showdown

SUPER BOWL

BRONCOS, SEAHAWKS PUNCH TIX FOR NY: SPORTS

PUBLIC ENEMY #1

NYPD cops left 84-year-old Kang Wong a bloody mess after he physically resisted their attempts to ticket him for jaywalking on the Upper West Side, witnesses said. The blitz was sparked by the third pedestrian fatality this month around West 96th Street.

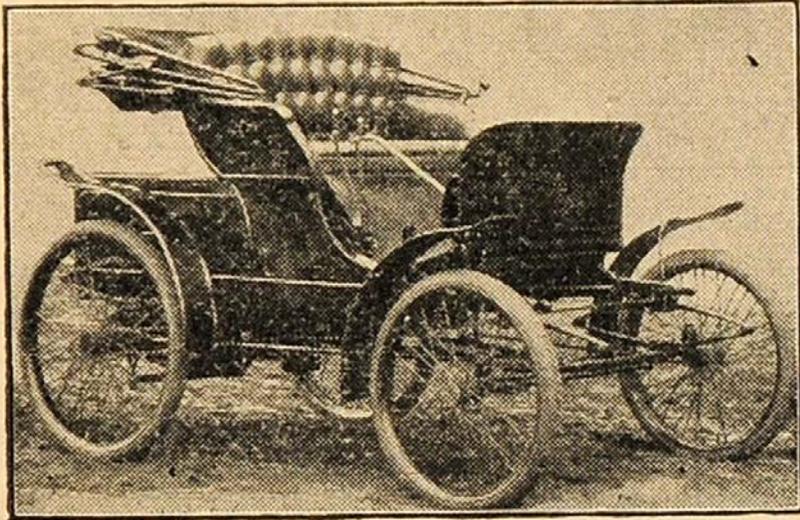
PAGES 6-7

Man, 84, bloodied by cops — for **JAYWALKING!**

PHOTO: GUY LAWRENCE

Why did we do this?

Away with the Whip!



You can do without it now. No horse to keep, to stable, to stumble or to bolt.

Science and skill offer you the

Winton Motor Carriage

Price \$1,000. No Agents. The triumph of 19th century mechanism. Easy and safe to operate. Speed controlled by your own will. Clean, elegant and economical. Hydro-carbon system. *Send for free cata*
THE WINTON MOTOR CARRIAGE CO., Cleveland, Ohio.

“Easy”

“Safe”

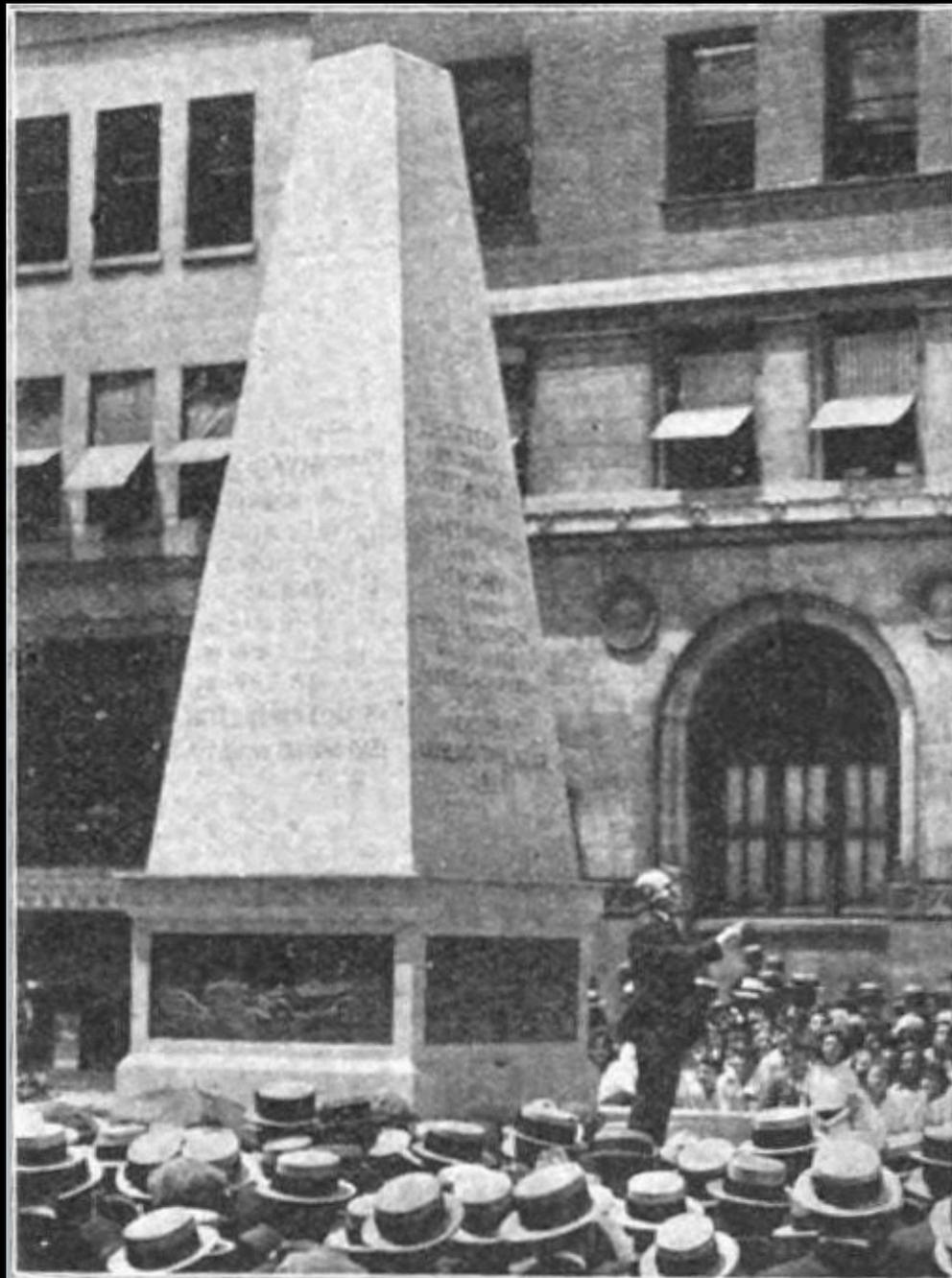
“Clean”

“Elegant”

“Economical”

“A city made for speed is made for success.” – Le Corbusier

But, there were side effects..



Baltimore 1922
Monument to
children killed in
street traffic.

CINCINNATI SPEED GOVERNOR WAR OF 1923

VOTE "YES"

On the Ordinance to Curb Speeding

Which Shall A Limit of 25 Miles Per Hour and
It Be--- SAFETY
----- or -----

No Limit and the Lurking Danger
of DEATH!

China is the most
Backward of All Nations

Would YOU ~
Build A Wall Around
CINCINNATI
AND RETARD YOUR CITY'S
PROGRESS?

Defeat the Motor Governor Ordinance

It Will NOT Curb, Reckless Driving!

These Organizations
Are Opposed
To This Ordinance

- Automobile in Motion
- American Business Club
- Business Men's Club
- Central Labor Council
- Cincinnati Automobile Club
- Cincinnati Automobile Dealers Association
- Cincinnati Automobile Trade Association
- Cincinnati Chamber of Commerce
- Cincinnati Motor Club
- Cincinnati Retail Merchants Association
- Cincinnati Truck and Motor Truck Owners Association
- Cincinnati Association
- Hardware Club League
- Madison Club Association
- Industrial Association
- Mechanics and Manufacturers Association of Cincinnati
- South Street Business Men's Association

What are the things that will happen if the use of the so-called Motor Governor is made compulsory?

- 1—Accidents will increase.
 - (a) Because the motorist is deprived of full control of his machine.
 - (b) Because the careless motorist will be given a false sense of security, thus being privileged to drive at the rate of 25 miles an hour.
 - (c) Because traffic congestion would be increased, thereby endangering motorists.
- 2—The line of business in Cincinnati will be enormous, for the ordinance builds a wall around the city excluding every motor car from entering unless equipped with a governor. It will isolate the city and make Cincinnati the butt of national ridicule.
- Insurance experts believe that accidents will increase if the ordinance should pass. And, therefore, are anticipating an increase in rates.
- 3—While the Police Department already crippled, are diverting their time to the continuous task of sealing and inspecting these devices on 50,000 automobiles, the city will be wide open to the criminal elements.
- 4—The enforcement of the ordinance will cost the taxpayers approx. nearly \$250,000 a year.

4—If the governor should get out of order—and this is liable to happen every time an automobile goes over a bump—the owner will be sent to jail without the benefit of a trial—a violation of the fundamental principles of American justice.

5—The manufacturers of motor governors will get wealthy overnight. Automobile owners will be compelled to pay them between \$25 and \$50 for each device—a matter of over \$1,250,000. THE CITY WILL NOT GET ONE CENT OF THIS MONEY.

6—Even if the ordinance is adopted, the careless driver would still be with us—AND CARELESS DRIVING IS THE CAUSE OF MOST ACCIDENTS.

The Motor Governor Ordinance will not offset or cure these facts: That the largest number of accidents occur when the auto is traveling at a speed of less than 20 miles an hour. (The Governor Ordinance permits 25 miles.)

That it is easy for anyone with slight mechanical knowledge to tamper with the device between inspection periods.

Automobile governors are not new. If they were successful every automobile would carry a governor as part of its standard equipment today. They are easily put out of order—are worthless on hills—dangerous in emergencies and absolutely unnecessary.

Present Laws Are
Adequate

The laws and ordinances we have now are adequate to curb our auto speeding, but what is more important—'LAWLESS, reckless driving.

The laws for speeding and reckless driving is a direct result of the 'enactment' of these present laws and ordinances.

Defeat the ordinance by voting "NO!"

Do Not Help To Build a Chinese Wall Around Cincinnati
Let's Make It Unanimous and—

“
VOTE NO
”



CITIZENS CAMPAIGN COMMITTEE
Charles E. Corwin, Secretary

Did controlling pedestrians and
modern engineered roads
solve the problem?

No

**Today 3700 people will die worldwide
in traffic crashes**

3,700 PEOPLE DIE DAILY WORLDWIDE



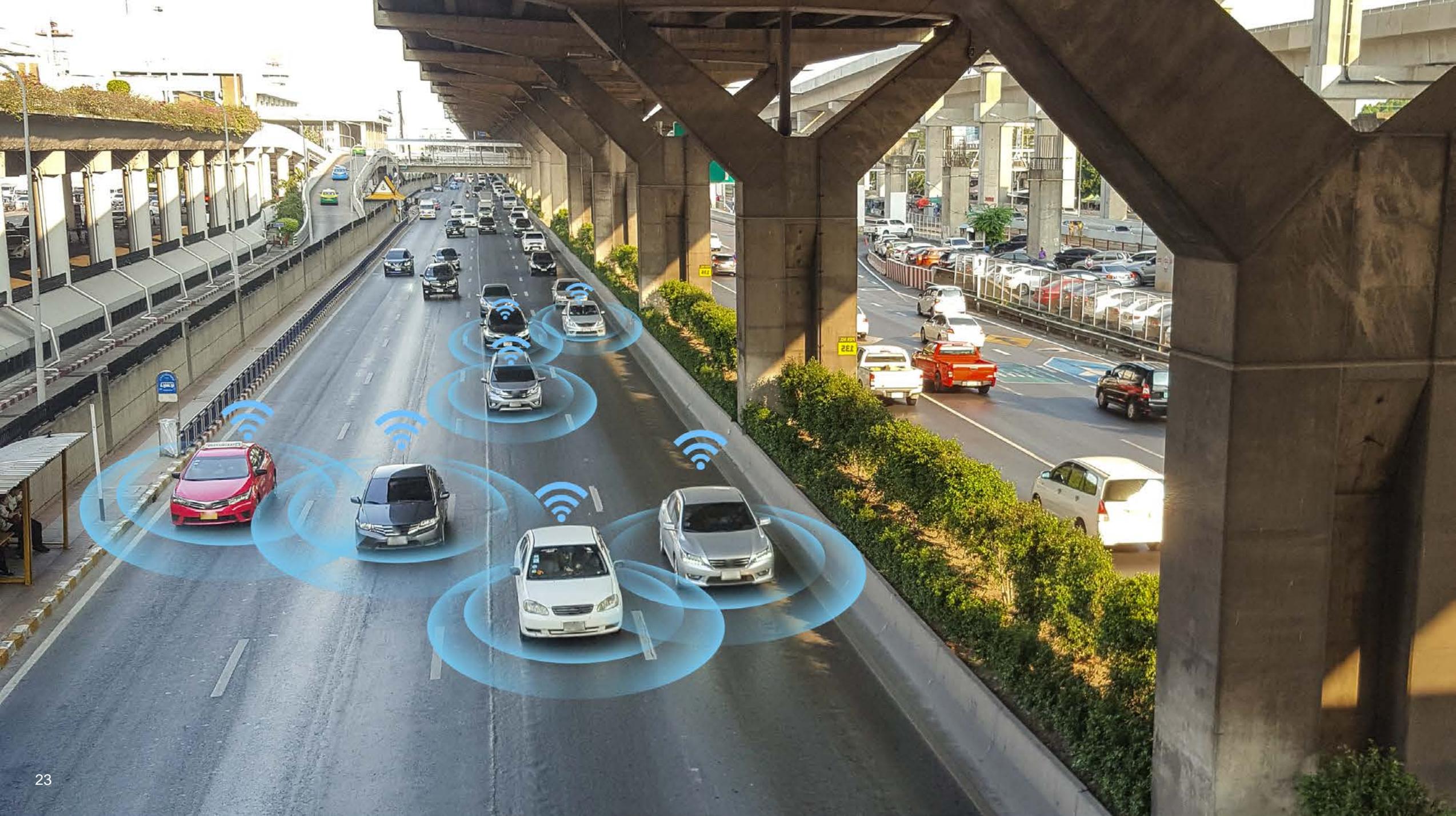
March 10, 2019

Equivalent to 24 plane crashes daily. Ethiopian Airlines 157 dead.

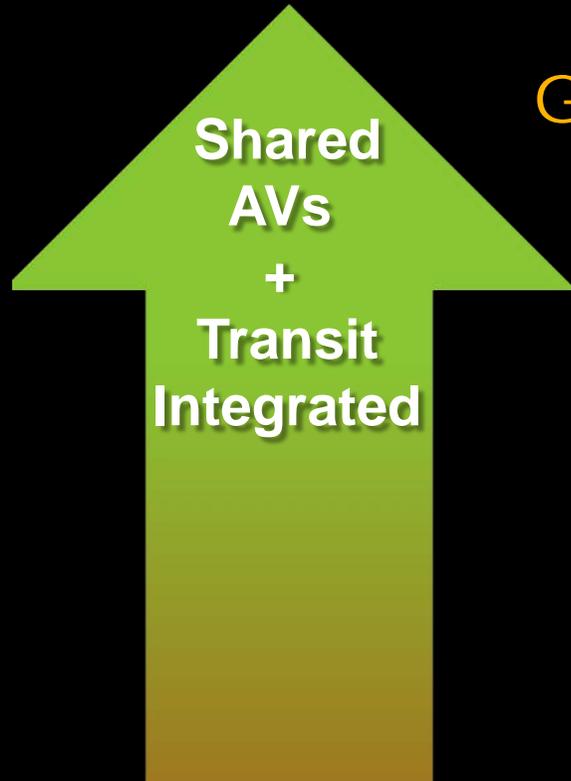
CAR SIDE EFFECTS

- 3,700 worldwide deaths daily
- 1.35 million killed annually
- 50 Million killed since 1900
- Gridlock
- Pollution
- Climate Change
- Sprawl
- Energy Dependency
- Obesity/Inactivity
- More...

**We could have done better
and must do better with
autonomous vehicles (AVs.)**



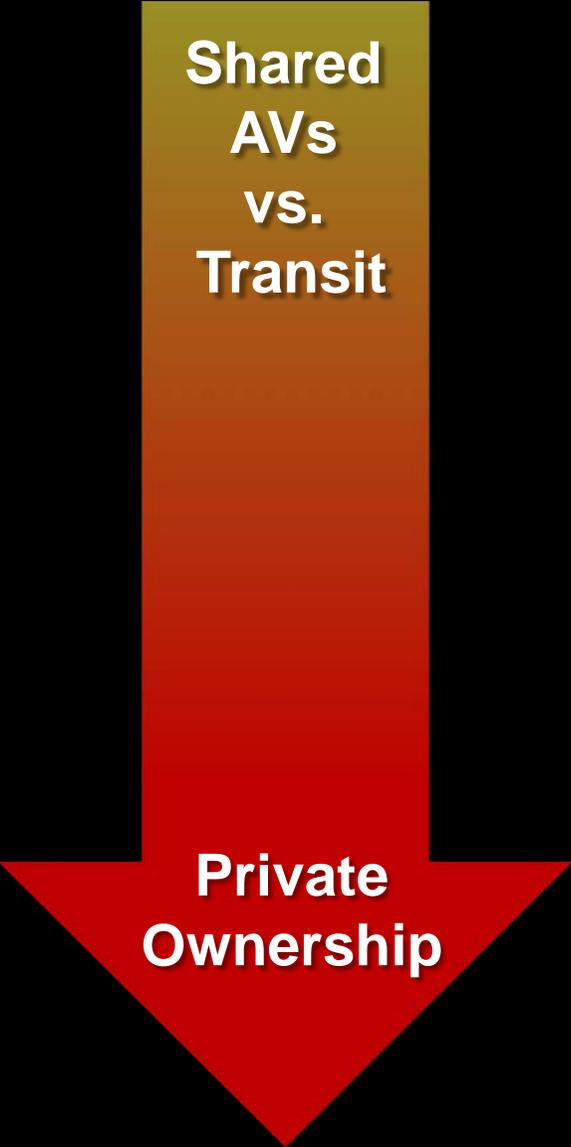
THE GOOD, THE BAD AND THE UGLY (POSSIBILITIES)



GOOD

- Congestion diminishes
- Crashes, injuries, and deaths plummet
- Disabled and low-income well-served
- Energy consumption plummets
- Less pollution
- Smaller carbon footprint
- Last mile solved
- Parking demand goes way down

THE GOOD, THE BAD AND THE UGLY (POSSIBILITIES)



Shared
AVs
vs.
Transit

BAD

- Traffic miles soar & congestion increases
 - Many jobs disappear
 - Peds, bikes squeezed out
 - Unaffordable for poor and rural dwellers
 - Reverses millennial trend eschewing driving
 - Competes with and undermines existing transit
-

UGLY

- Widespread gridlock
- Public transportation decimated
- Heart disease/stroke/diabetes skyrocket
- Everybody gets a license (even your dog)
- A new “modernist” view of cities
- Encourages sprawl

Truth vs. Hype

“We’re less than two years away from complete autonomy.”

– Elon Musk, June 2016

“We will be feature complete, full self-driving, this year...I am certain of that. That is not a question mark.”

– Elon Musk, Feb. 2019

“Level 5 will never happen globally.”

– Thomas Sedran, CEO of Volkswagen Commercial, March 2019

“Autonomy always will have some constraints.”

– John Krafcik, CEO of Waymo, Nov. 13, 2018

“We’re not even remotely close to being...truly autonomous.”

– Austin Russell, CEO Luminar, July 2018

U.S.:

Humans responsible

94% of fatalities

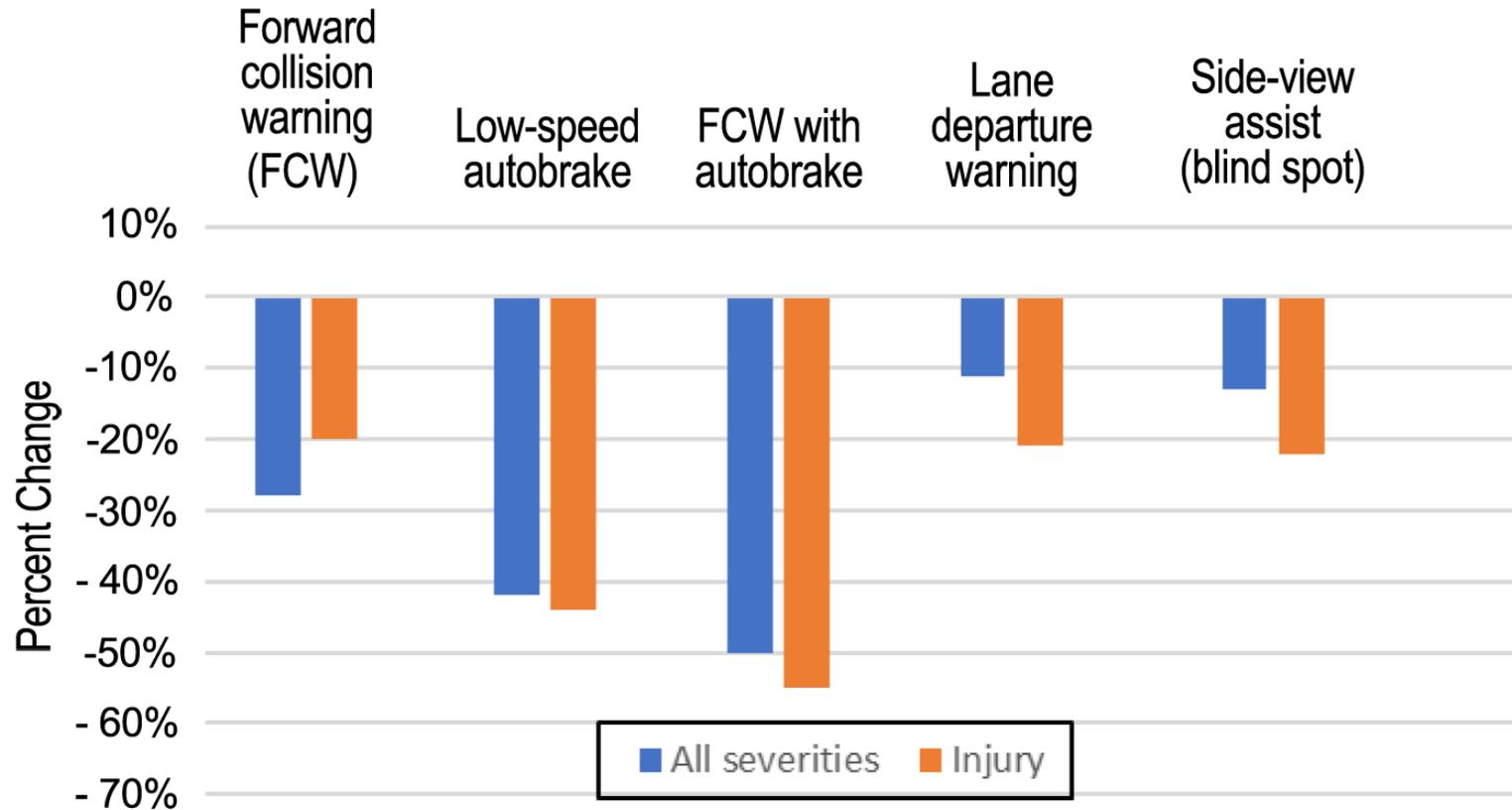
Sweden:
Humans fallible
Vision Zero

Sweden fatality rate **plummeted 62%**

U.S. rate 4 X Sweden

CARS CAN BE SAFER NOW

Summary of Technology Effects on Relevant Police-Reported Crash Types



Source: IIHS, May 2018

**40 countries agreed to
automatic emergency braking standard
as soon as 2020.**

But, not U.S. or China

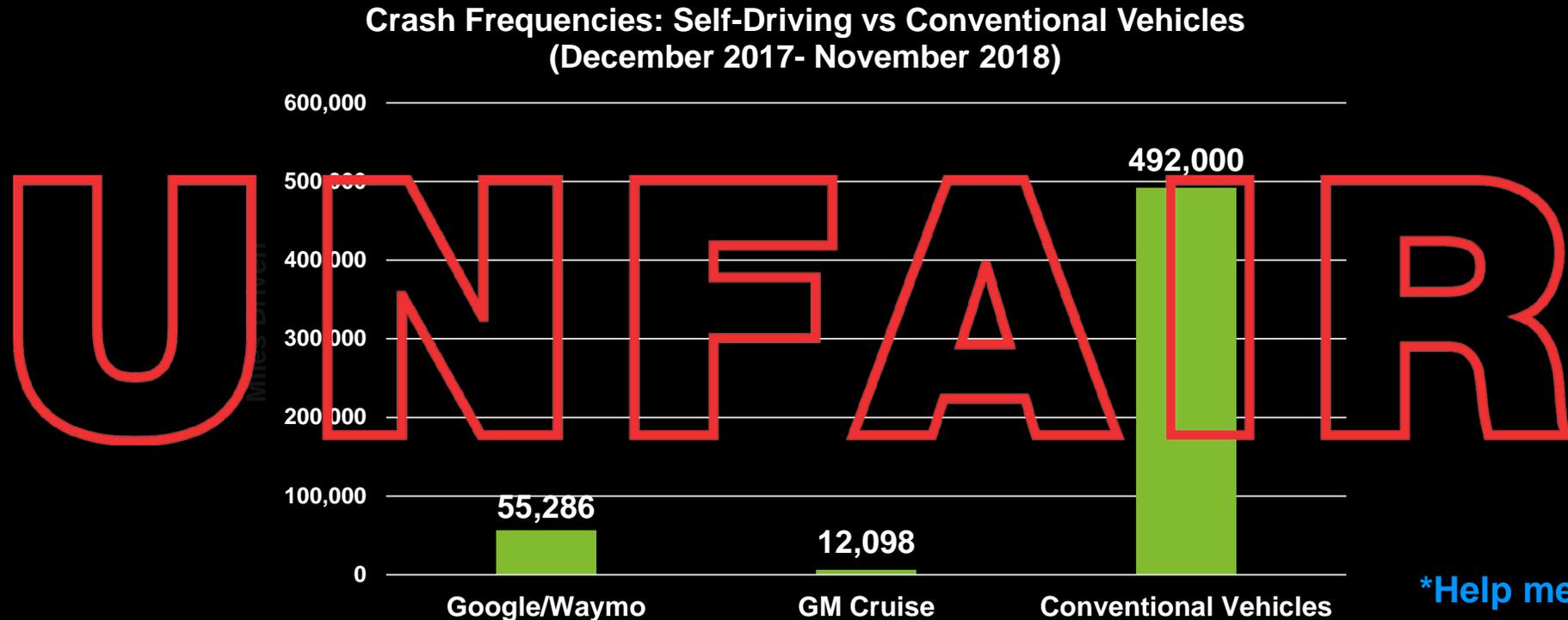
Self-driving already safer.

Not supported by data.

SELF-DRIVING CRASH HISTORY (WHAT WE KNOW*)

Fatalities: 4 Known in USA

- In 2017, there were 1.16 fatalities per 100 million miles, conventional driving
- 4 fatalities in conventional vehicles would take avg. 345 million miles driven
- Number of miles driven to date in AV mode unknown

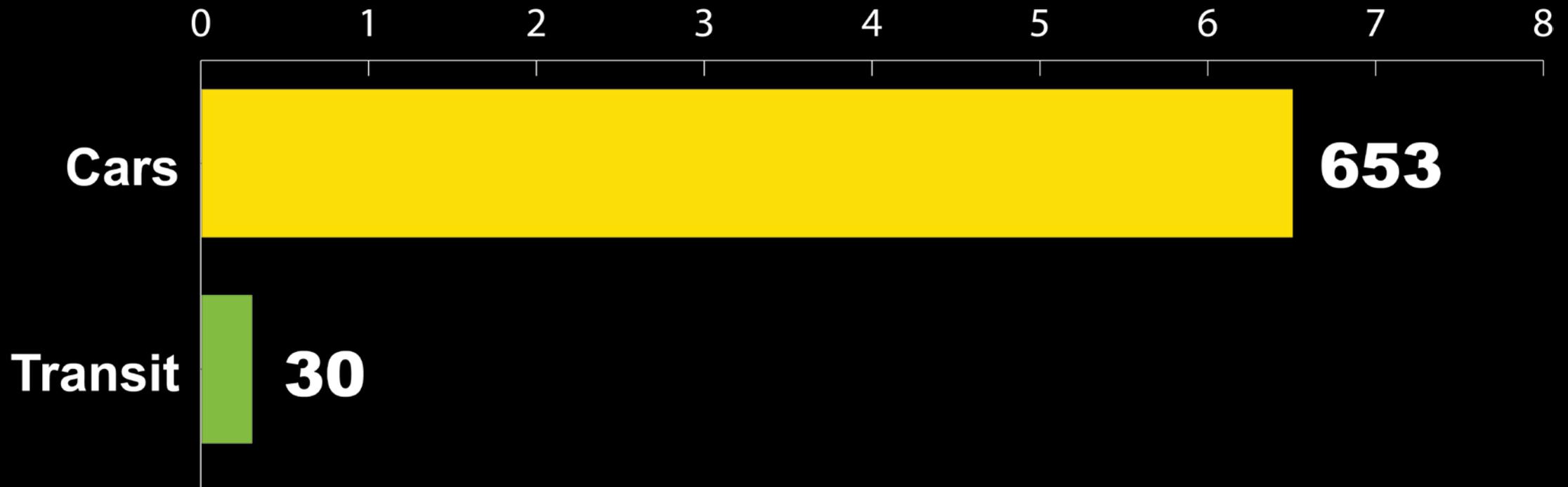


*Help me get the data

Switching passengers from
cars to AVs will save lives.

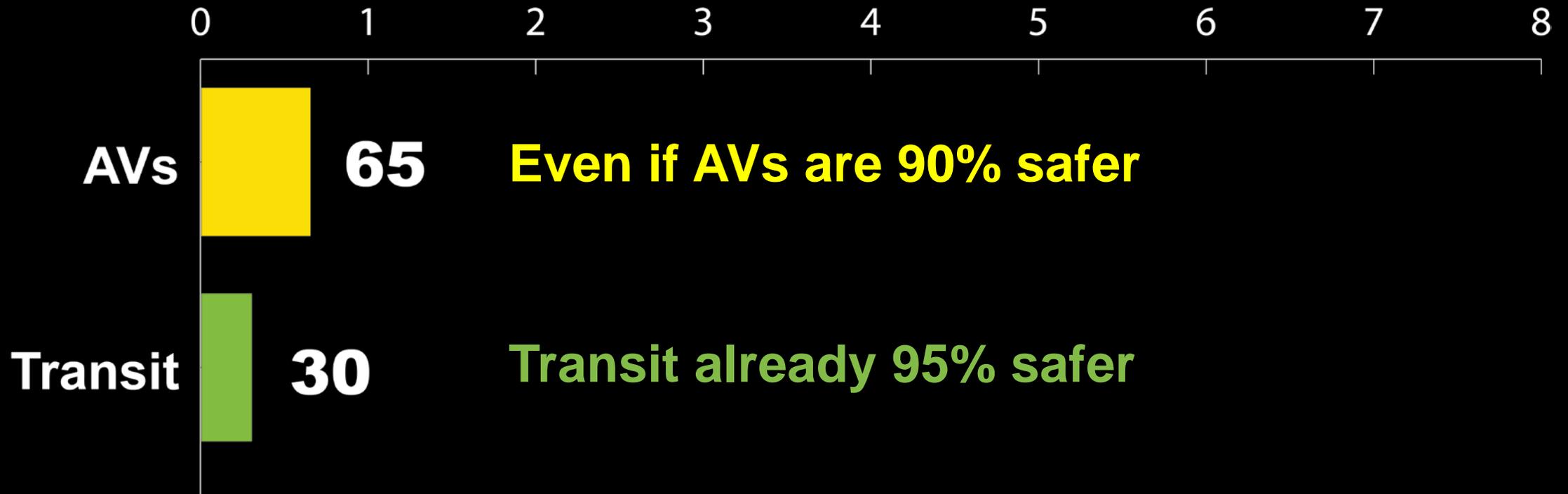
But taking them from transit
will increase fatalities.

DEATHS PER 100 BILLION PASSENGER MILES



Source: Passenger Deaths By Mode, 2000-2014, [APTA](#) (x100)

DEATHS PER 100 BILLION PASSENGER MILES



Source: Passenger Deaths By Mode, 2000-2014, [APTA](#) (x100)

If we spend more time in cars,
we increase our mortality rate

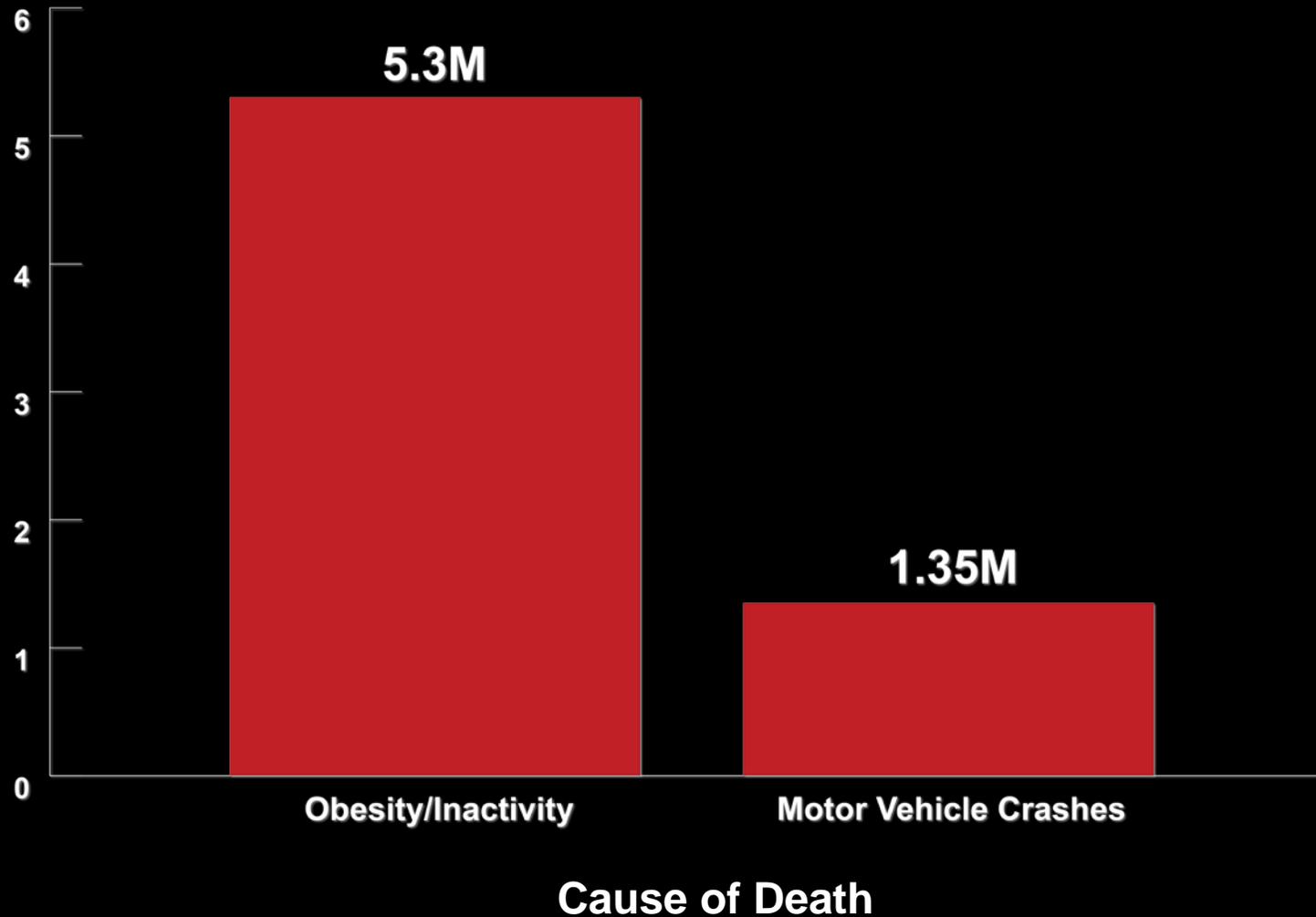




WALL-E IS NOT FAR-FETCHED



WORLD DEATHS (INACTIVITY VS. CRASHES)

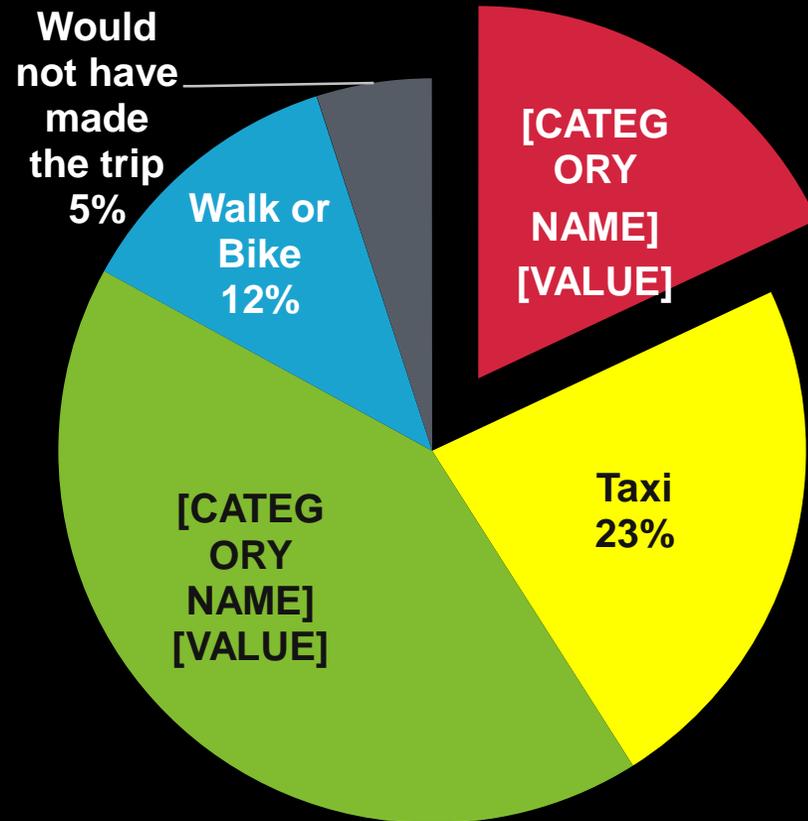


Traffic will improve.

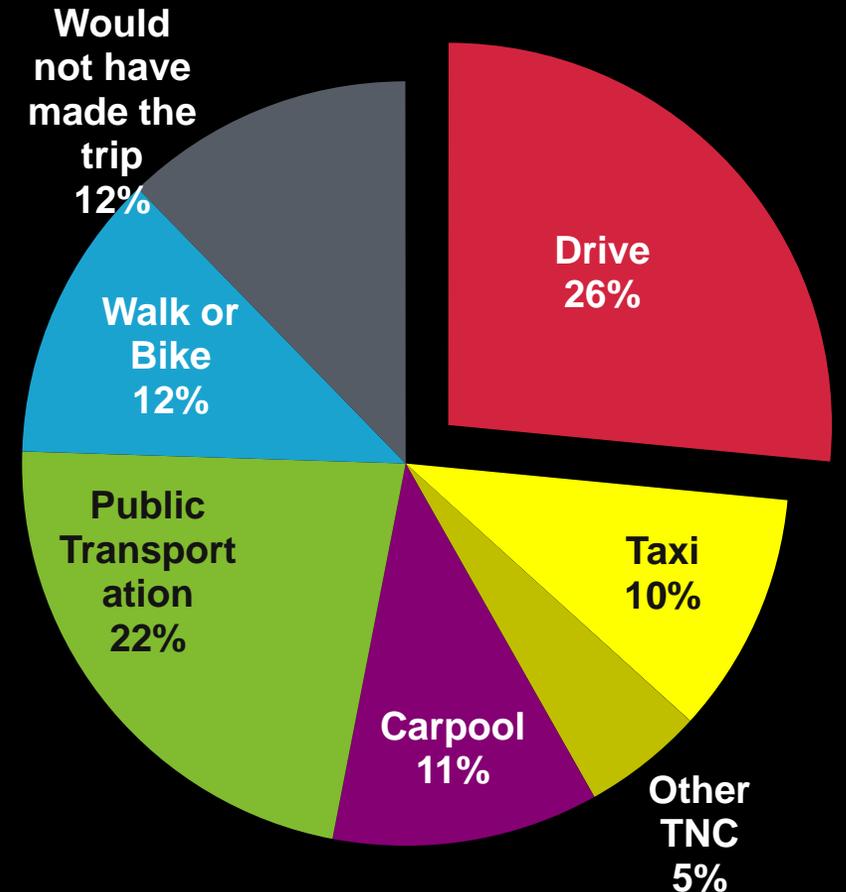
Not supported by
independent analysis.

A GLIMPSE INTO THE FUTURE: TNC MODE SHIFTS

Boston



Denver



App-based cars travel 1.58 miles for each passenger mile*

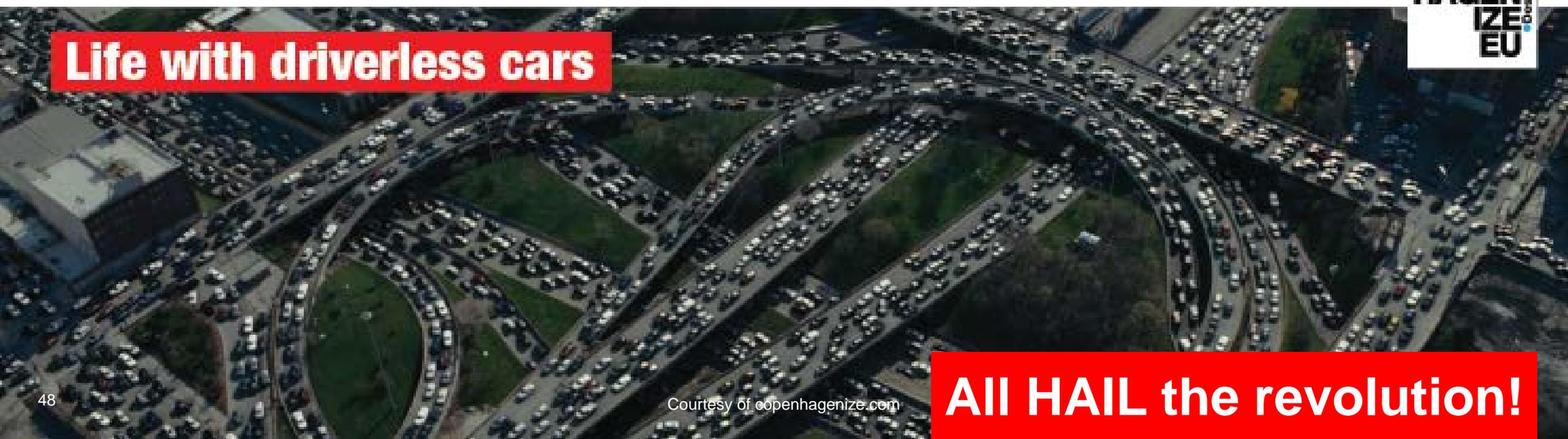
Source: The New Automobility: Lyft, Uber and the Future of American Cities by Schaller Consulting, July 2018

Source: The Adoption of Shared Mobility in California, Circella et al. 2018

Source: Impacts of Ridesourcing—Lyft and Uber, Henao 2017



Life without driverless cars



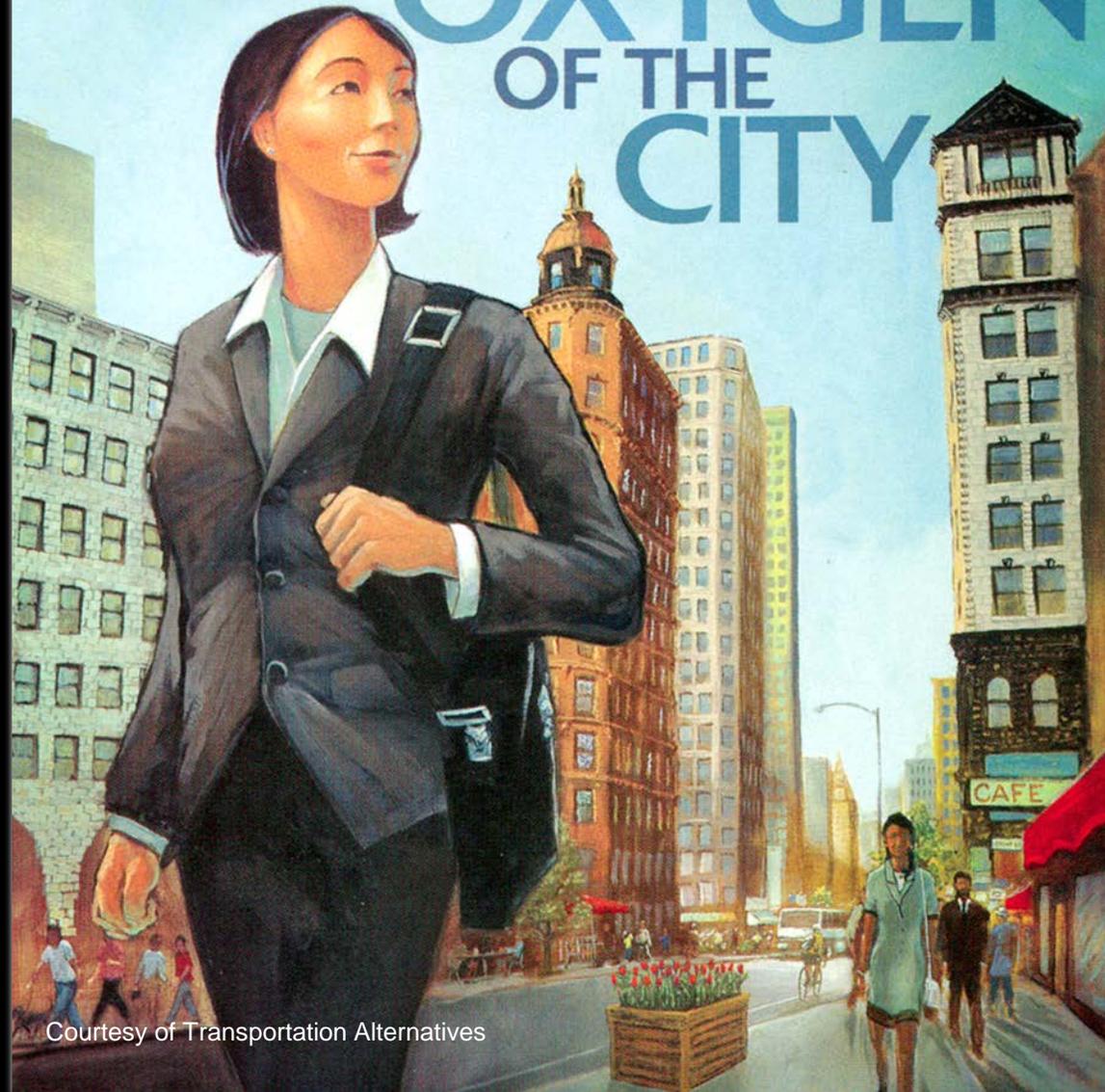
Life with driverless cars

All HAIL the revolution!

Cities and towns will thrive

Not if we repeat 20th-century
mistakes

WALKERS ARE THE OXYGEN OF THE CITY



If we don't walk we lose the vibrancy of cities and towns.

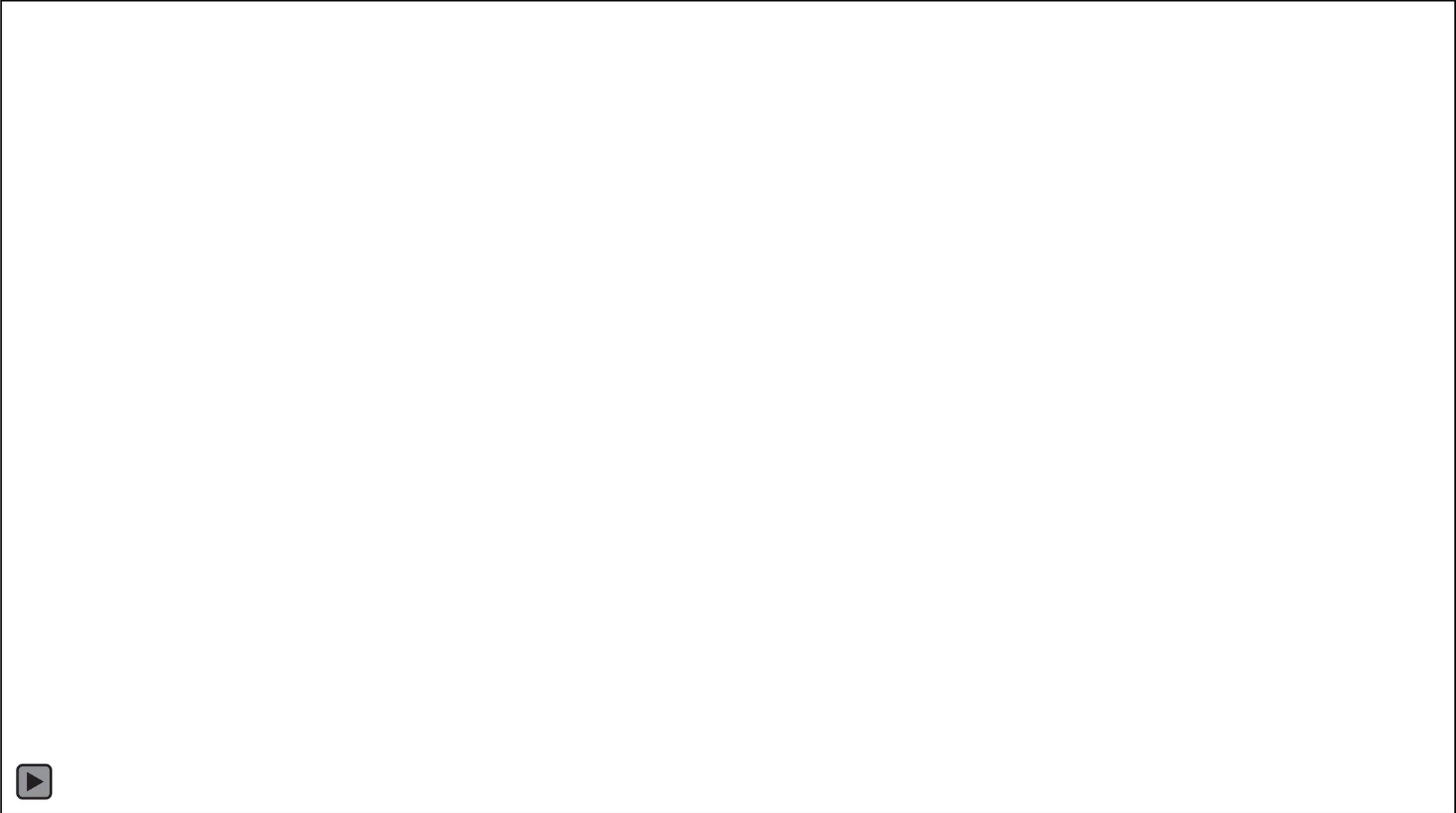
THE FOLLOWING PEDESTRIANS MAY NOT BE DETECTED:

- shorter than 3.2 ft. or taller than 6.5 ft.
- wearing oversized clothing
- carrying large baggage, holding an umbrella, etc.,
- bending forward or squatting
- pushing a stroller, wheelchair, or bicycle
- walking closely in groups
- wearing white and look extremely bright
- in the dark, such as at night or while in a tunnel
- whose clothing nearly the same color as surroundings
- near walls, fences, guardrails, or large objects

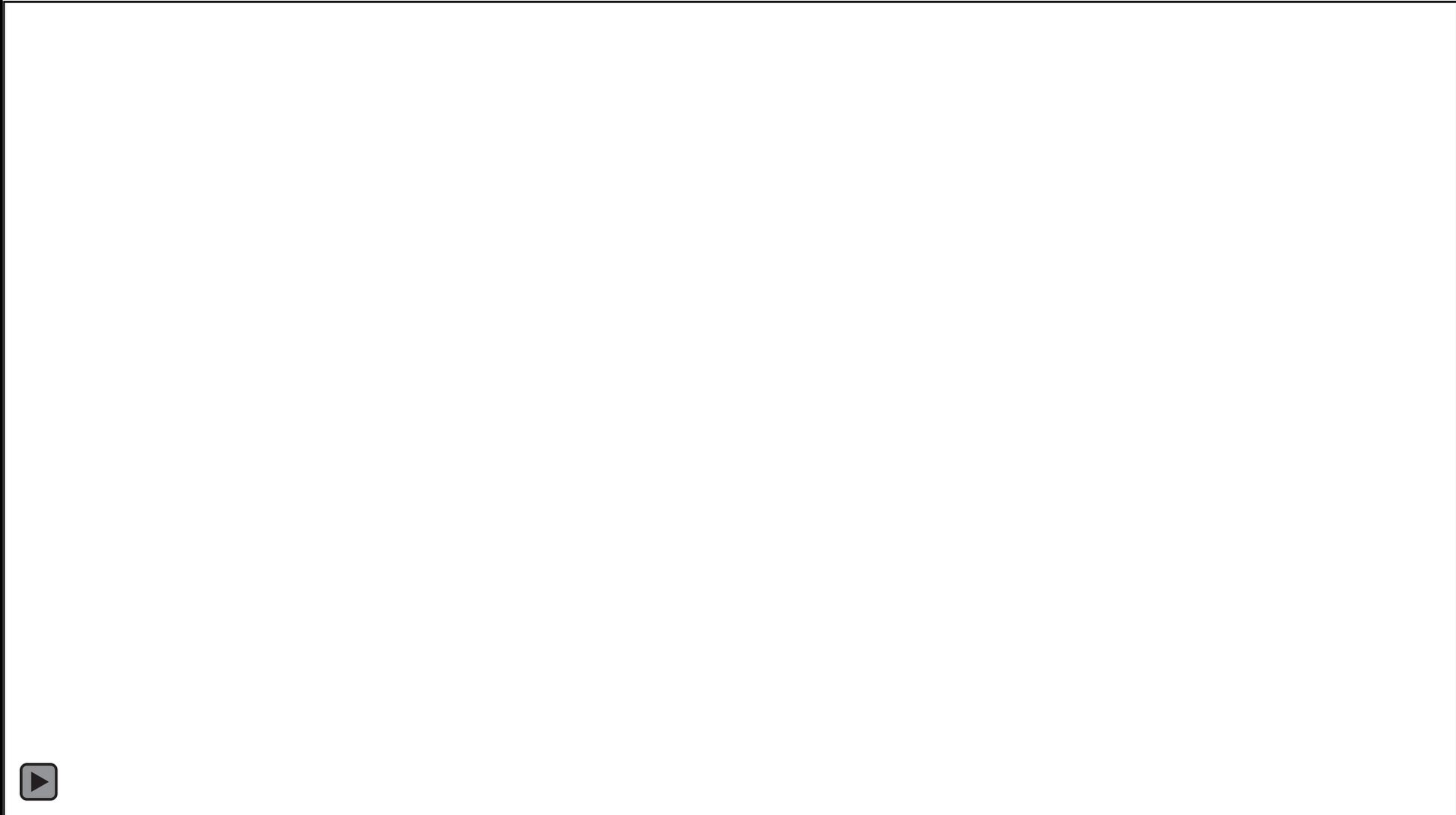
A visitor from 2100 warns:

Climate change devastating, cities
collapse, transport major factor.

BY 2030 WALKERS IN CITIES SLOWED AV TRAFFIC TO A CRAWL



BY 2035, PEDESTRIANS WERE FENCED IN LIKE CATTLE



DOING IT RIGHT

Government, Society, and Industry Should:

- Sell rides, not cars; integrate with transit
- Get AV \$upport for roads
- Establish AV street typology plan



South St. Seaport, NY

Car Free



Queens, NY

Slow Streets



Autobahn, Germany

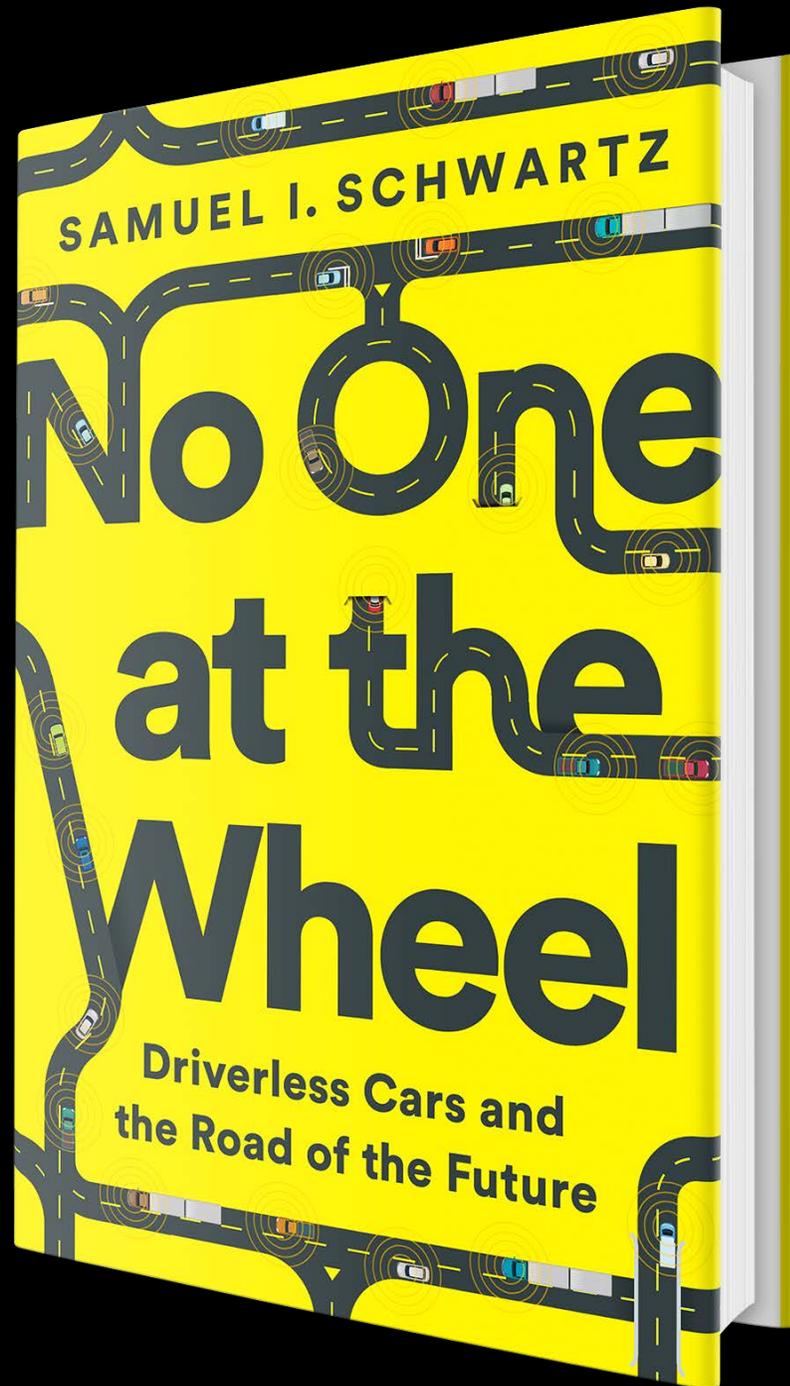
Freeway/Highway

DOING IT RIGHT (CONTINUED)

Government, Society, and Industry Should:

- Utilize pricing to maintain adequate mobility
- Maintain and support good mass transit
- Emphasize last mile
- Ensure equity for low income, disabled, and elderly
- Don't mess with bike/ped growth
- Reallocate parking for better use
- Enact legislation and enforcement policies preemptively
- Develop a counter-terrorism strategy
- Humanize street design: narrow lanes, widen sidewalks, don't add lanes





Available at Amazon, Barnes & Noble, IndieBound, Google Play, Kobo, and eBooks.

www.samschwartz.com

CONGESTION PRICING NYC



Sam Schwartz

CONGESTION PRICING

- FHV charge began Feb. 2019 So. of 96th
 - ❖ \$2.75 Uber/Lyft | \$2.50 Taxi | 75¢ Shared Rides
- Traffic Mobility Act – Passed 4/1/19
 - CP all vehicles So. of 60th
 - Revenue goal = \$15B bonds
 - 80% Subways & Buses
 - 20% Railroads
- Fee??
- Traffic Mobility Board report due Nov. 2020 (after elections)
- Exemptions:
 - ❖ FDR Drive & Westside Highway thru trips
 - ❖ Vehicles transporting disabled
 - ❖ CBD residents income < \$60K
- Earliest date Jan. 2021

