

STREETSMART: The Rise of Cities and the Fall of Cars

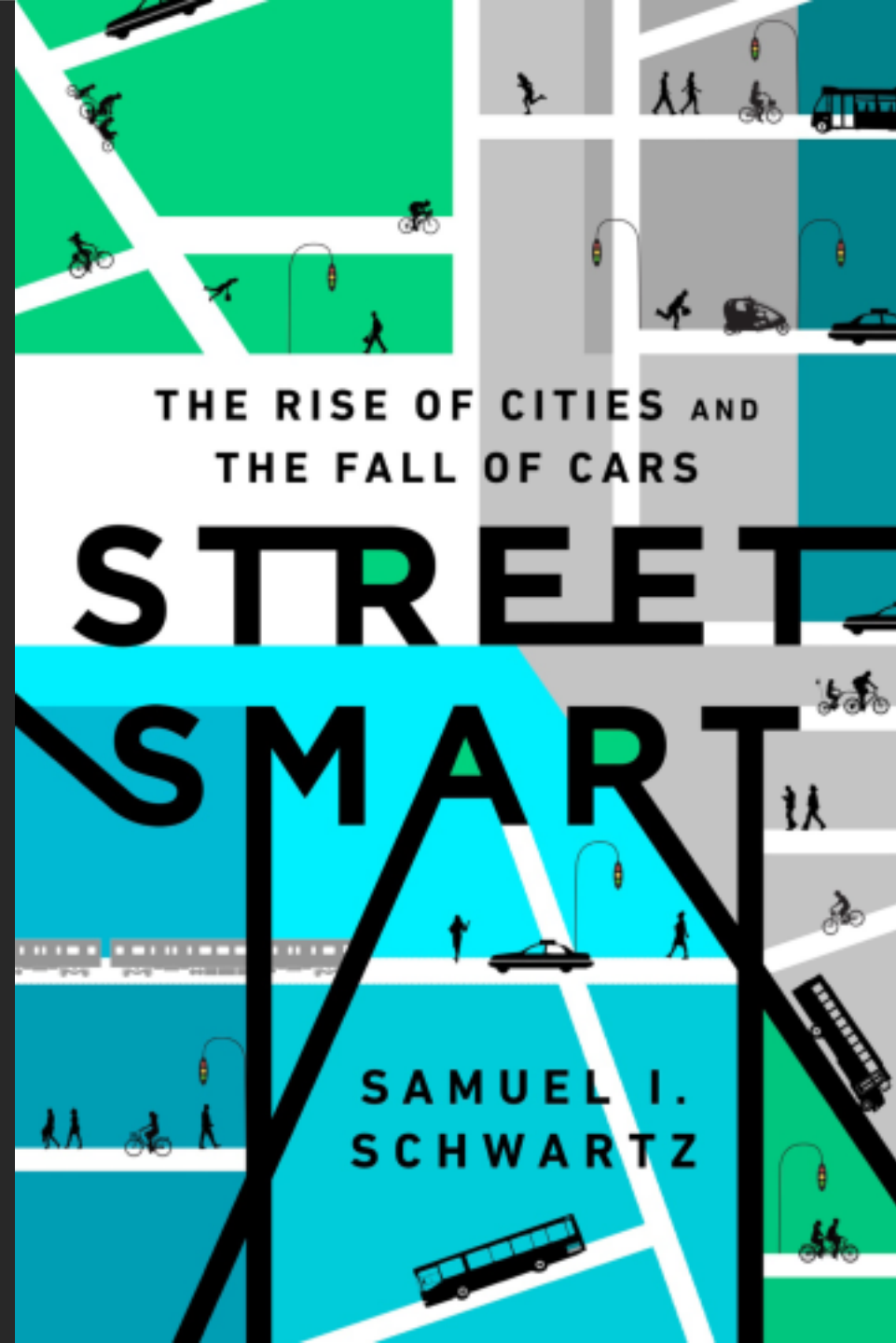
Samuel I. Schwartz, P.E.

Princeton University

September 26, 2016

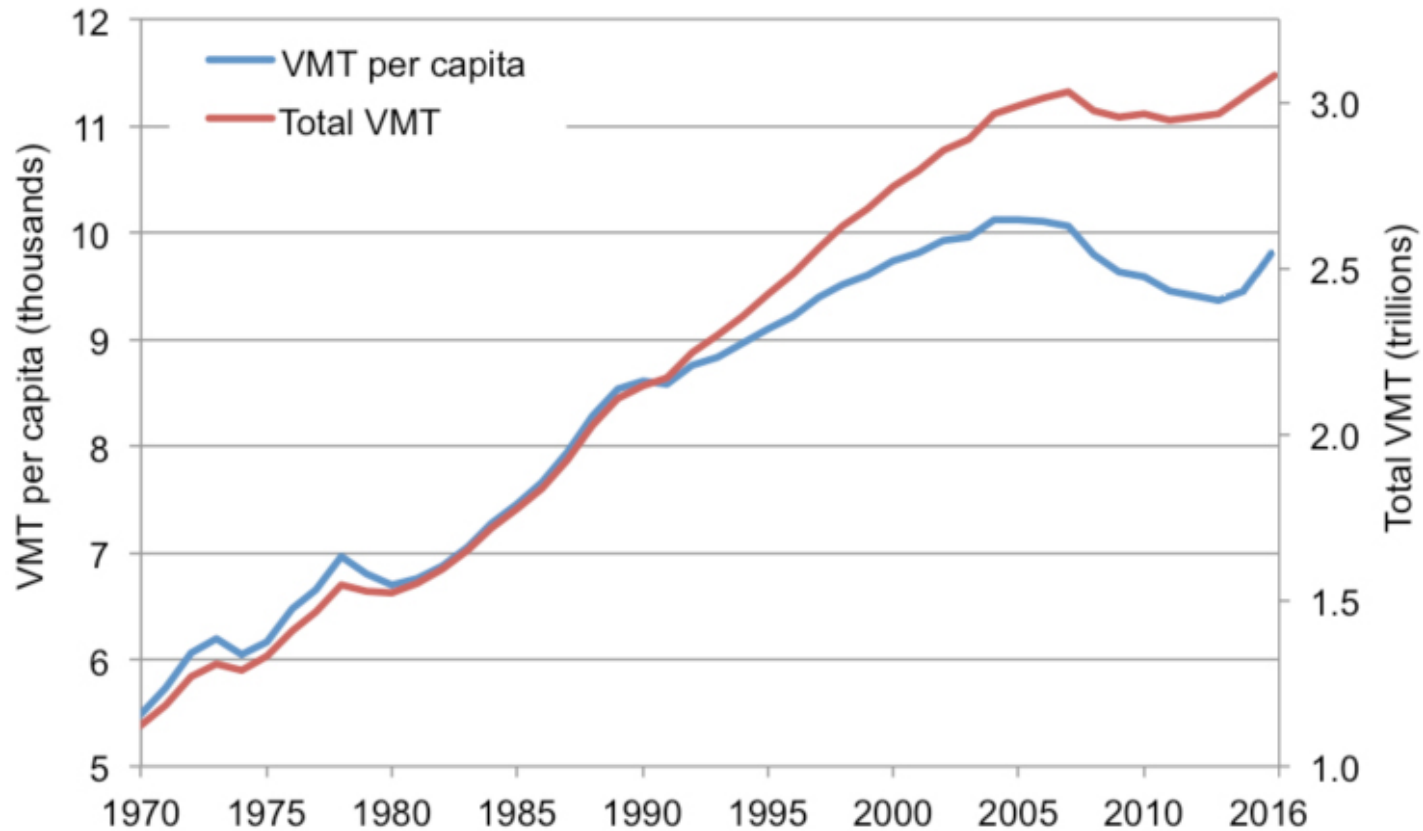
**Sam
Schwartz**

Transportation
Consultants



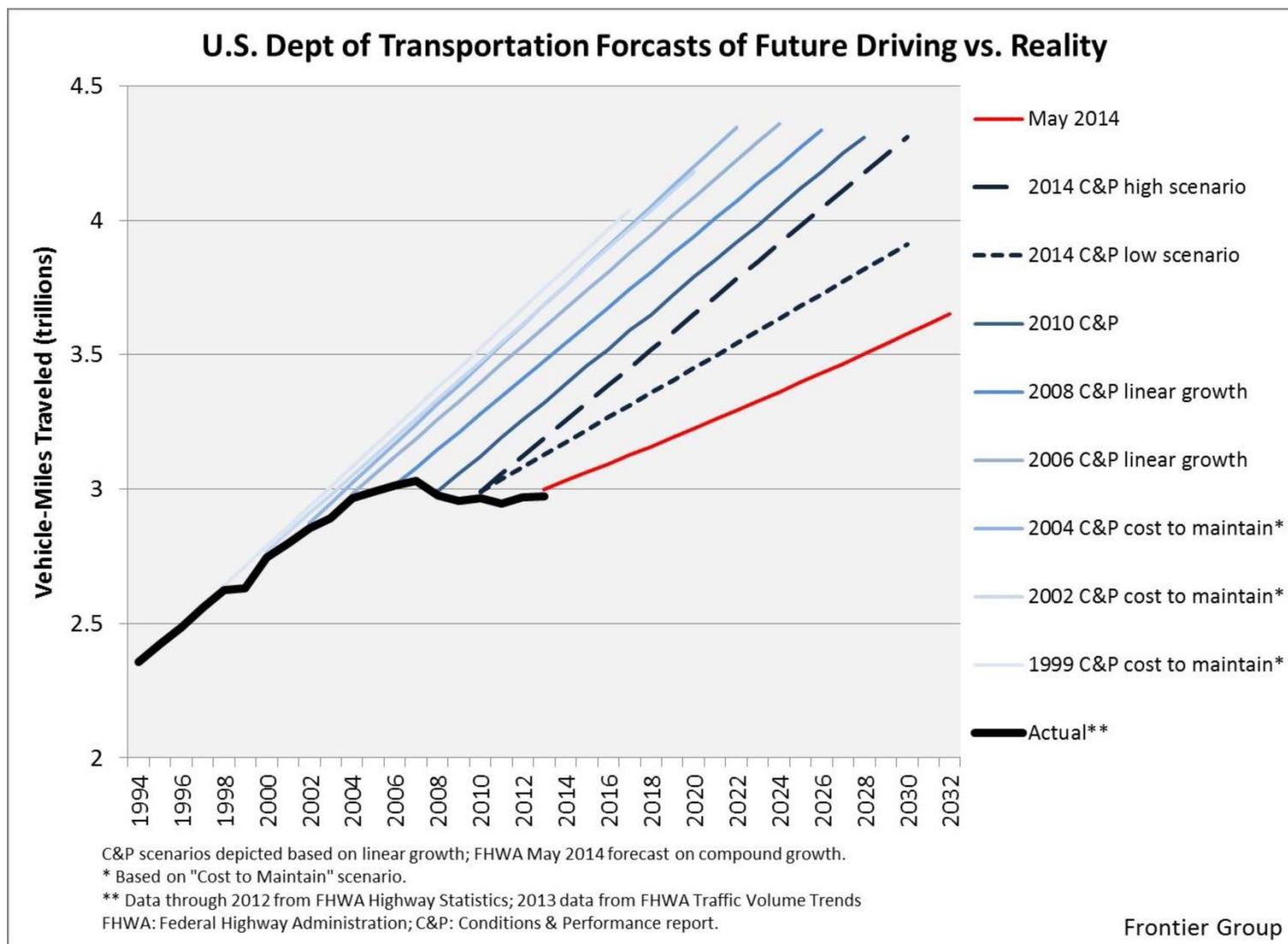
THE TRANSPORTATION REVOLUTION NO ONE PLANNED AND NO ONE SEEMED TO NOTICE

Total and Per Capita Vehicle Miles Traveled (VMT) 1970 - 2016



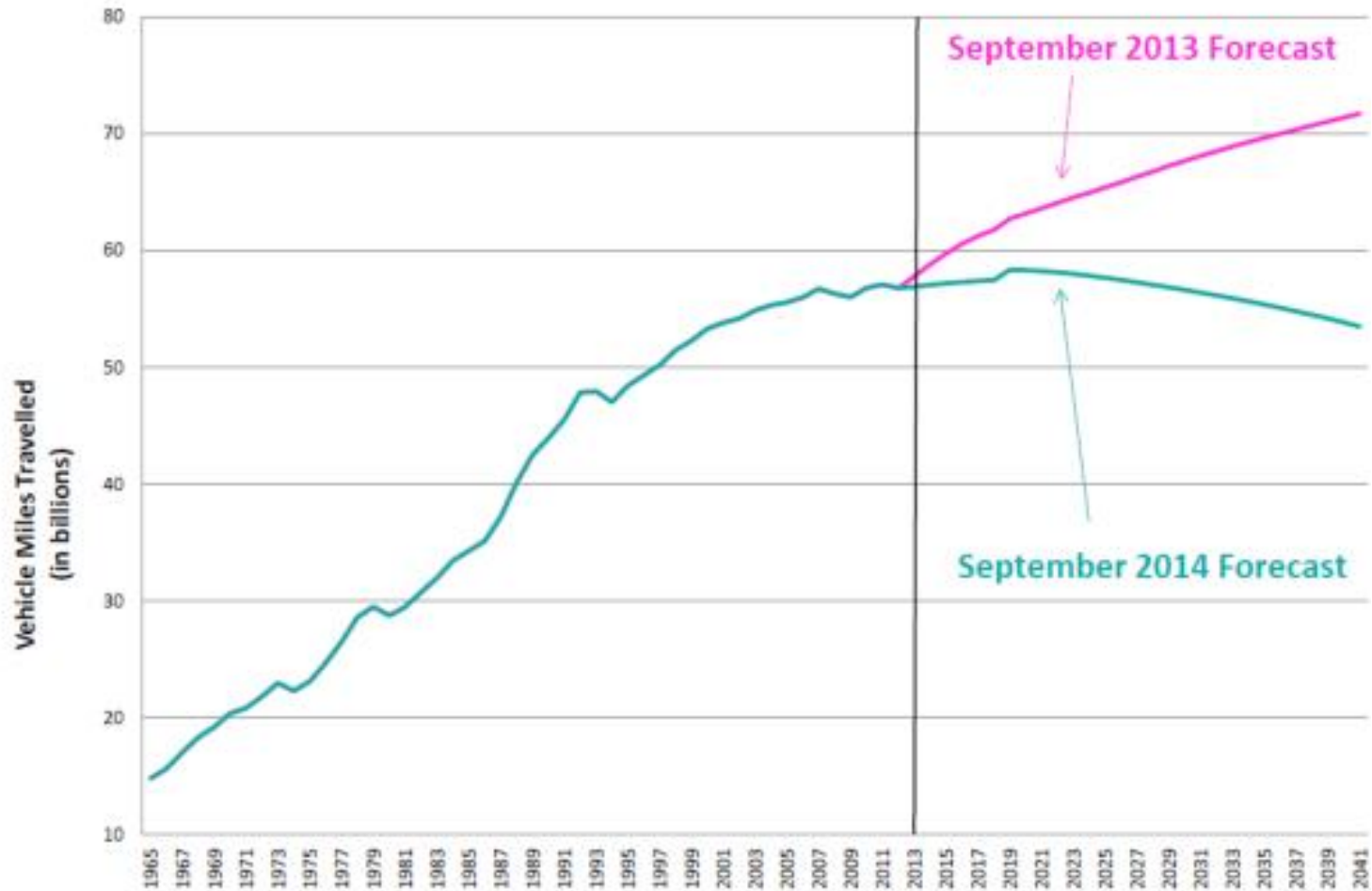
State Smart Transportation Initiative
[US. Federal Highway Administration](#)

“IT’S TOUGH TO MAKE PREDICTIONS ESPECIALLY ABOUT THE FUTURE” – YOGI BERRA



THE PARADIGM IS CHANGING

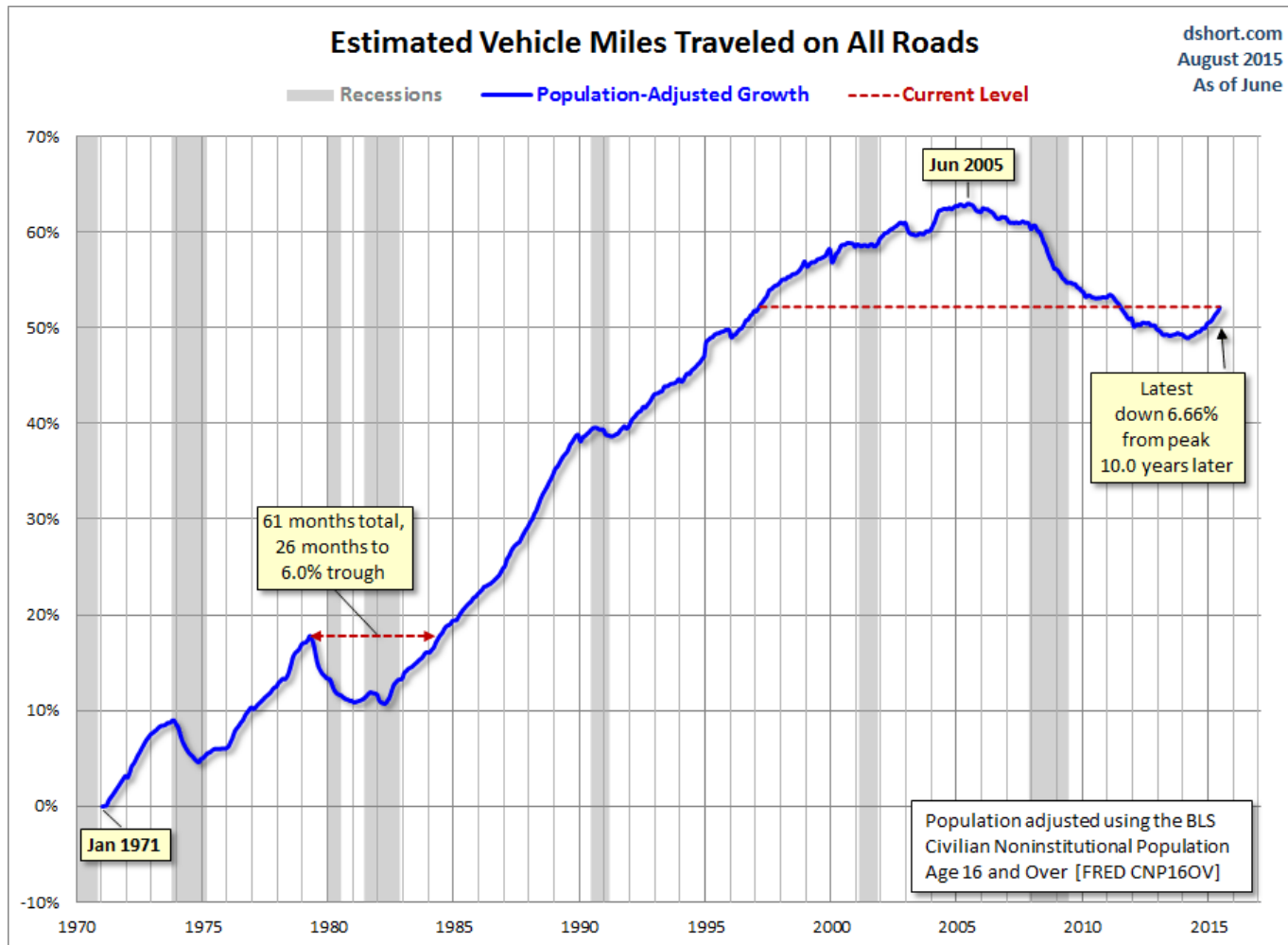
Washington State DOT Revises VMT Forecast



Source: "New forecast projects reduced VMT in Washington," State Smart Transportation Initiative, 3 November, 2014.

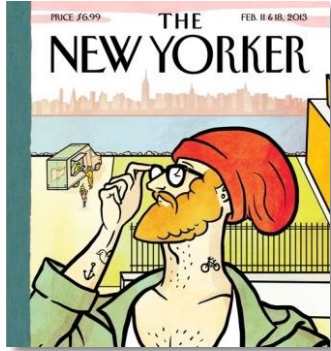
RECESSIONS DAMPEN VMT, THEN IT REBOUNDS WITH THE ECONOMY. BUT, NOT THIS TIME

Estimated Vehicle Miles Traveled on US Roads 1971-2015



Source: "Vehicle Miles Traveled on ALL Roads," Doug Short, August 2015.

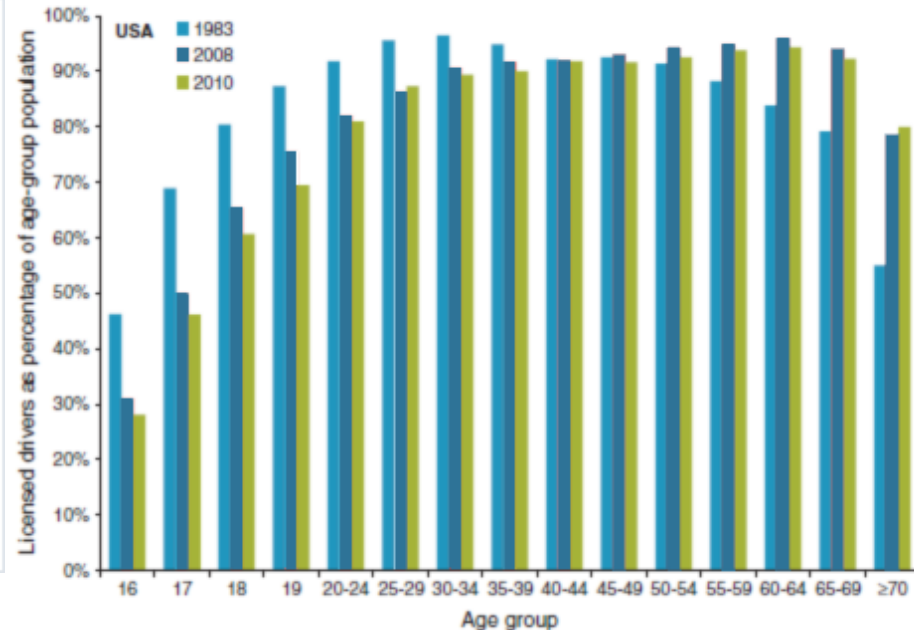
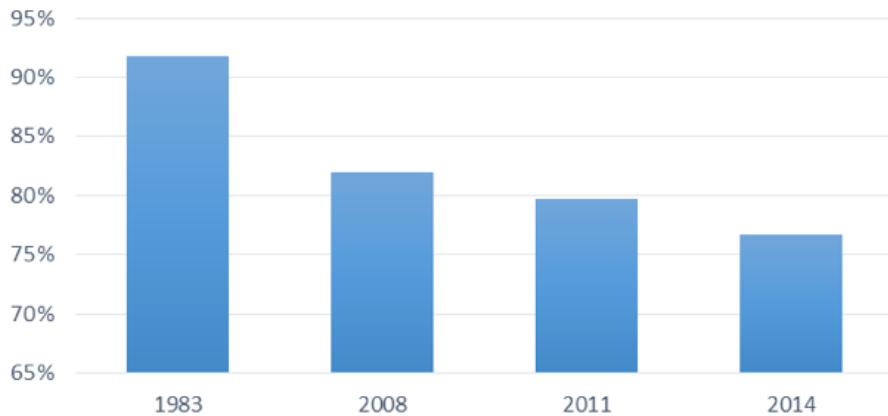
WHO'S DRIVING LESS? MILLENNIALS



“The **Millennial generation** seems to be defying its sheltered, suburban upbringing by **delaying the acquisition of a driver’s license and choosing transit**. Meanwhile, Baby Boomers, who grew up using transit and were encouraged to do so, are defying their upbringing by avoiding transit now.”

- “Who’s On Board: 2014 Mobility Attitudes Survey,” TransitCenter, 2014

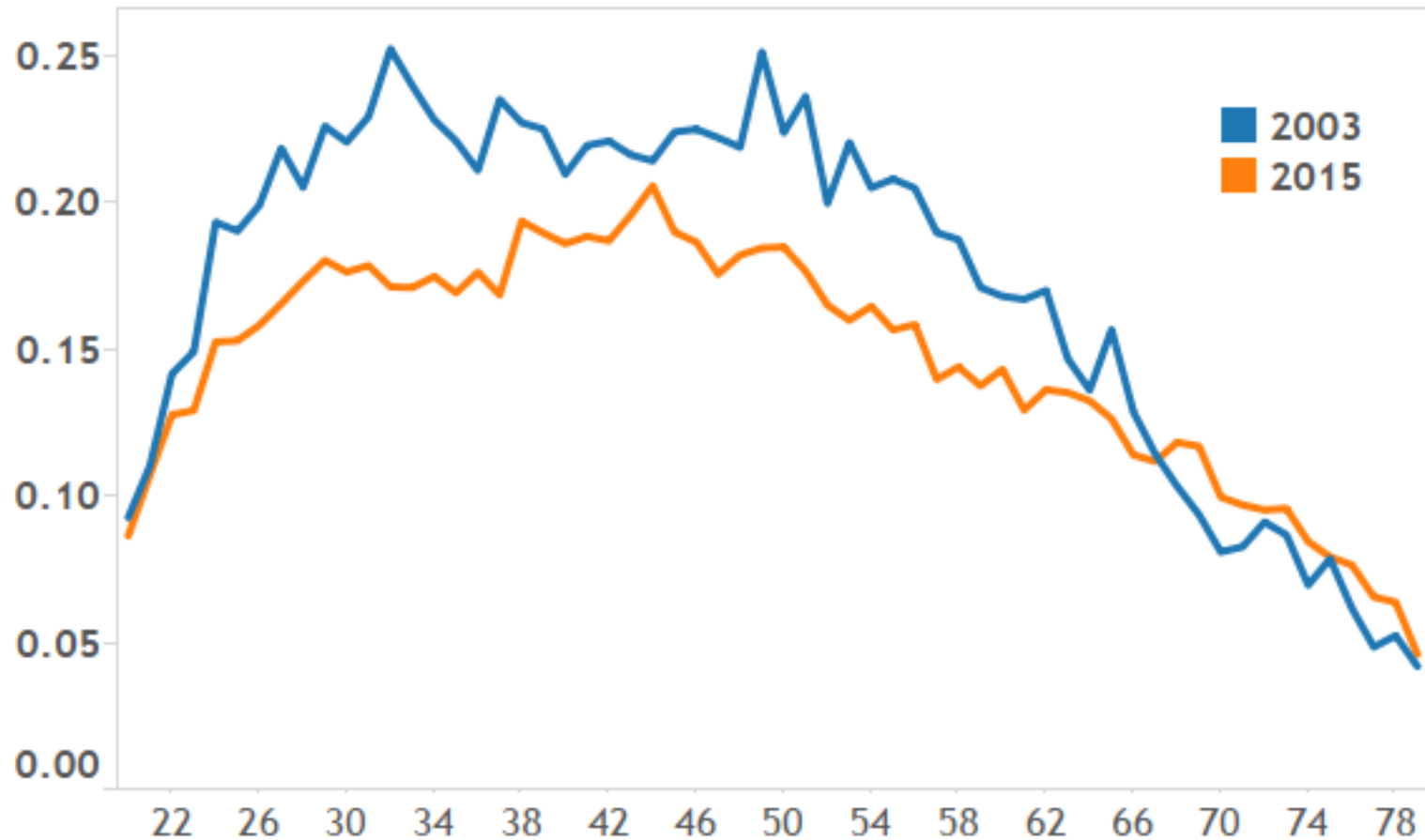
Percentage of 20 to 24-year olds with driver’s license in the U.S.



Sources: “The Future Isn’t What It Used to Be,” Victoria Transport Policy Institute, 28 March 2014; “Percentage of Young Persons With a Driver’s License Continues to Drop,” Michael Sivak and Brandon Schoettle, July 20, 2012; National Household Travel Survey, 2011; “Millennials in Motion,” U.S. PIRG, 2014

MILLENNIALS AREN'T BUYING CARS LIKE PREVIOUS YOUNG PEOPLE

Car loan originations per capita by age



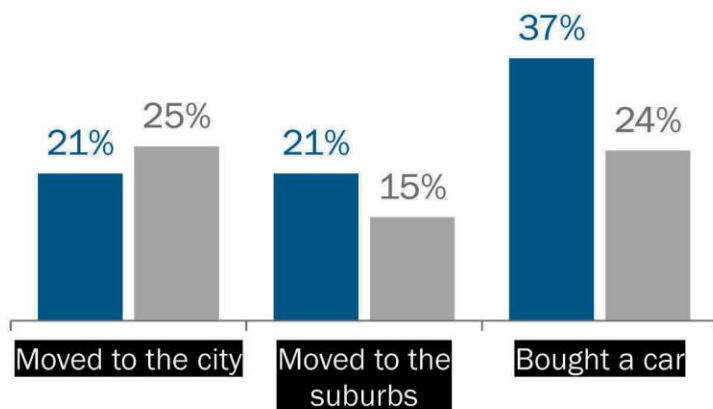
Source: Federal Reserve Bank of New York

CityObservatory

MANY MILLENNIAL PARENTS NOT FLEEING TO SUBURBS

% Say this occurred within
the **past 1-2 years**
(Among % Parents & Non-Parents)

- Parents
(of children 18 or under living in household)
- No children (aged 18 or under living in household)



% Say they anticipate this happening within
the **next 5 to 10+ years**
(Among % Parents & Non-Parents)

- Parents
(of children 18 or under living in household)
- No children (aged 18 or under living in household)



Source: "Millennials and Mobility: Understanding the Millennial Mindset," APTA, October 2013

WHY ARE THEY DRIVING LESS?

- Neighborhood choice: 38% of under-30s live in urban areas vs. 22% of 30-60s and 14% of over-60s
- Socializing: more via social media, less in person
- Shopping: more via Amazon, less at brick and mortar shops
- Graduated Driver Licensing statutes: harder to get a license
- Sharing economy
 - Car share
 - Bike share
 - Via, Uber, Lyft
- Student debt: no disposal income for a car
- Backseat rebellion: Millennials grew up watching their parents suffer while driving; mobility peaked in the 70's and 80's
- Unlocking the “mysteries” of transit
- Freedom Redefined

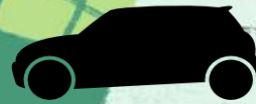
Source: “Who’s On Board: 2014 Mobility Attitudes Survey,” TransitCenter, 2014

Car Ownership

WHY?

1970: Freedom = 

2016: Freedom =  + Mobility portfolio



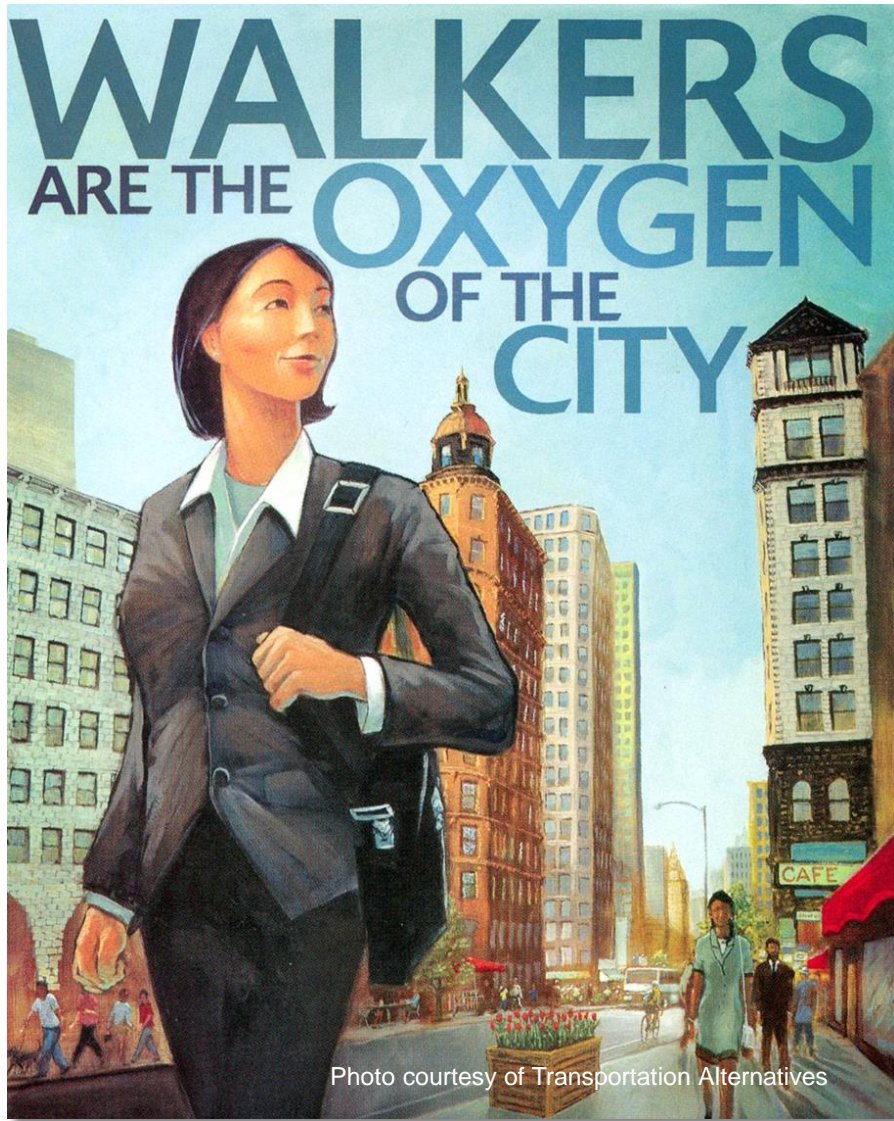
HOW ARE PEOPLE GETTING AROUND WITHOUT CARS?

Active Transportation

Any method of travel that is all or partly human-powered. It refers to transportation that supports walking, stair use, cycling, and transit. It includes long-term land use and transportation planning to encourage alternate (non-motor vehicle) forms of transport.



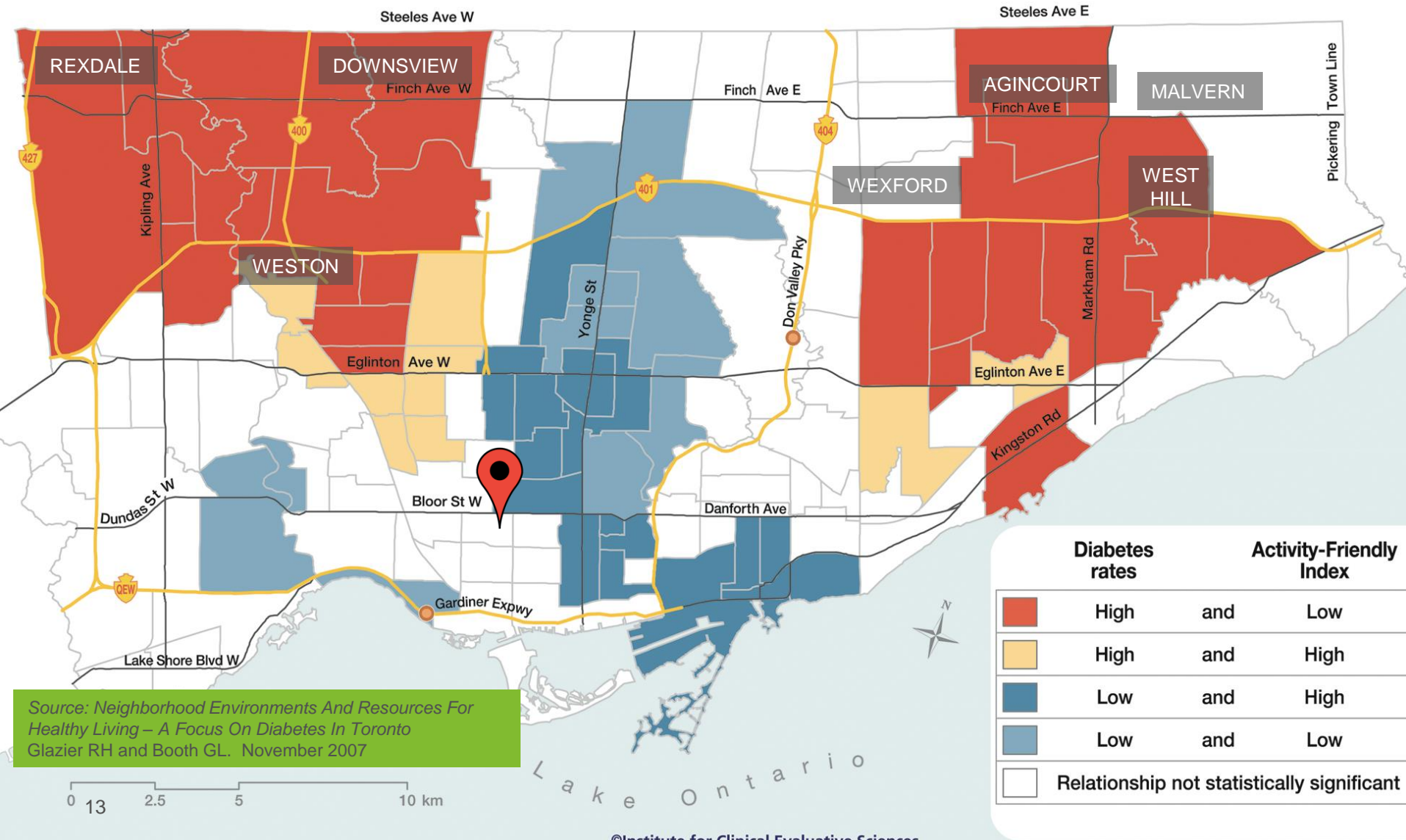
STREETS ARE MADE FOR WALKING



- Promotes weight loss
- Improves physical health
- Improves mental health
- Better cognitive function
- Sustainable
- Resilient
- Reduces pollution
- Stimulates economy
- Promotes social interaction
- Increases romantic opportunities ♥
- Greater appreciation of architecture
- Provides a sense of place
- Cost-effective

NATURAL ALLIES: PUBLIC HEALTH AND TRANSPORTATION PROFESSIONALS

Obesogenic Environment: Infrastructure, Land-use, Policies, Foods That Lead To Obesity



SURGEON GENERAL'S RX FOR HEALTH: WALK



Health Benefits Associated with Regular Physical Activity

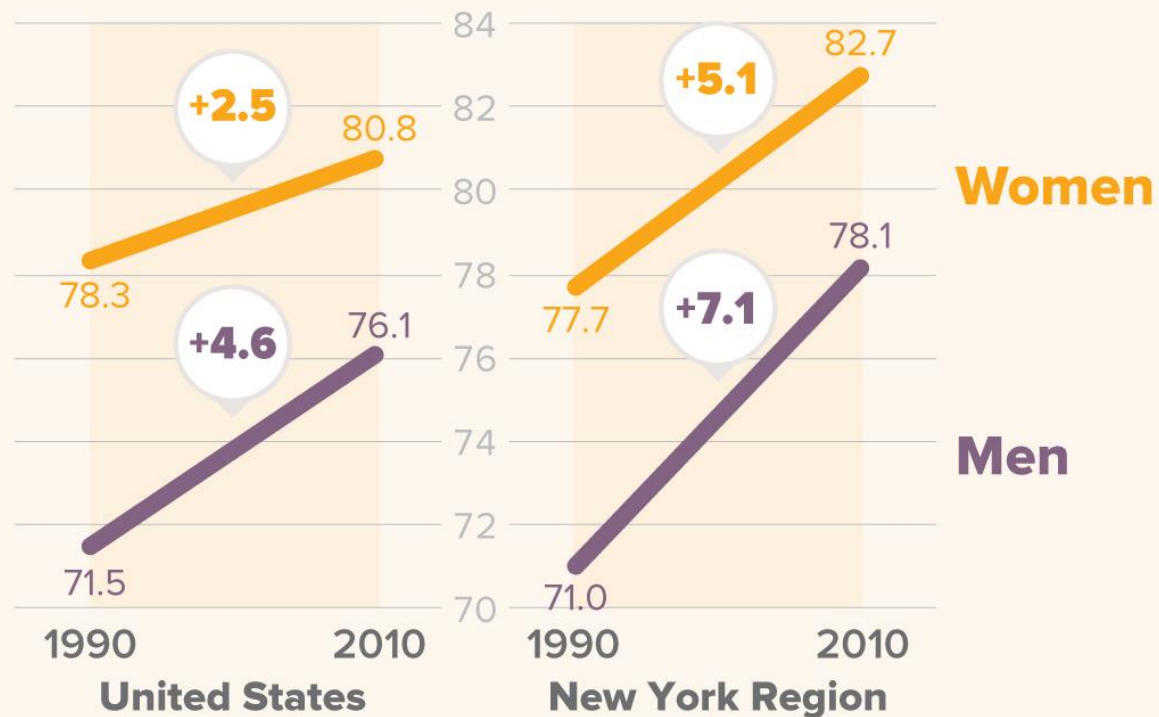
Children and Adolescents	Adults
<ul style="list-style-type: none"> ■ Improved cardiorespiratory fitness. ■ Improved muscular fitness. ■ Improved bone health. ■ Favorable body composition. ■ Improved markers of cardiovascular and metabolic health. 	<ul style="list-style-type: none"> ■ Lower risk of early death. ■ Lower risk of heart disease and stroke. ■ Lower risk of high blood pressure and adverse blood lipid profile. ■ Lower risk of type 2 diabetes. ■ Lower risk of colon and breast cancer. ■ Lower risk of metabolic syndrome. ■ Prevention of weight gain. ■ Weight loss, particularly when combined with reduced calorie intake. ■ Improved cardiorespiratory fitness. ■ Improved muscular fitness. ■ Prevention of falls. ■ Reduced depression. ■ Better cognitive function (for older adults).

Source: Sept 9, 2015 Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities

NY REGION'S LIFE SPAN AMONG HIGHEST IN NATION

Life expectancy in the New York region has surpassed that of the United States.

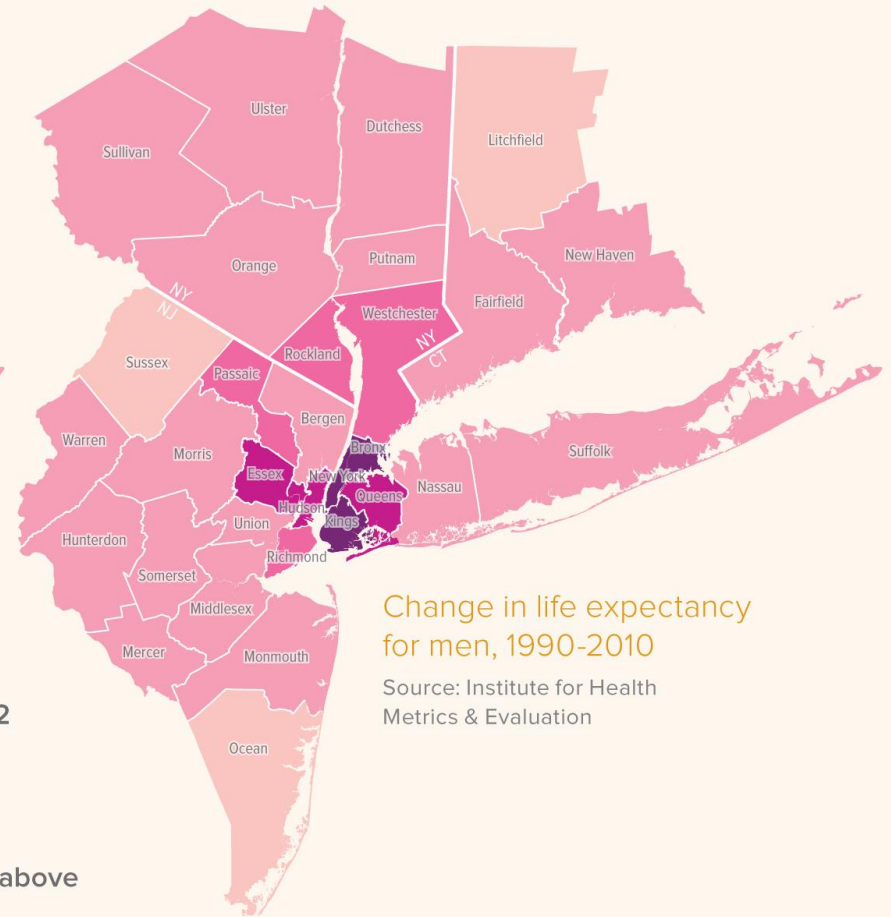
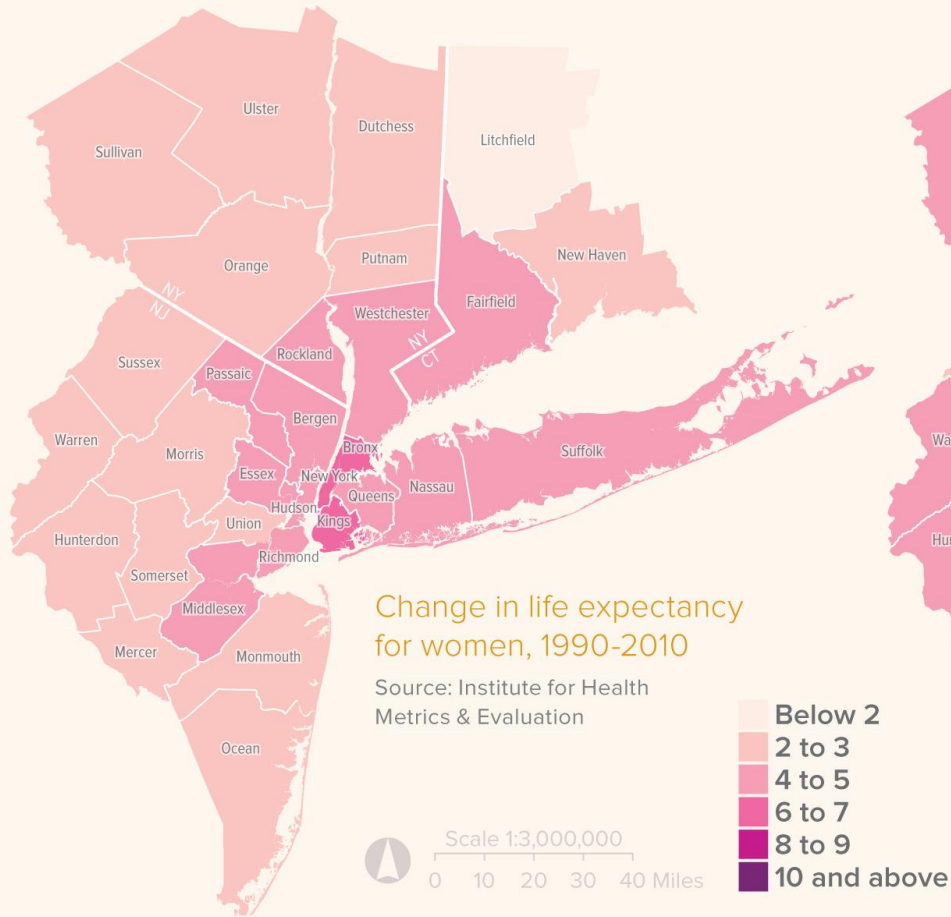
Life expectancy, 1990-2010



Institute for Health Metrics & Evaluation

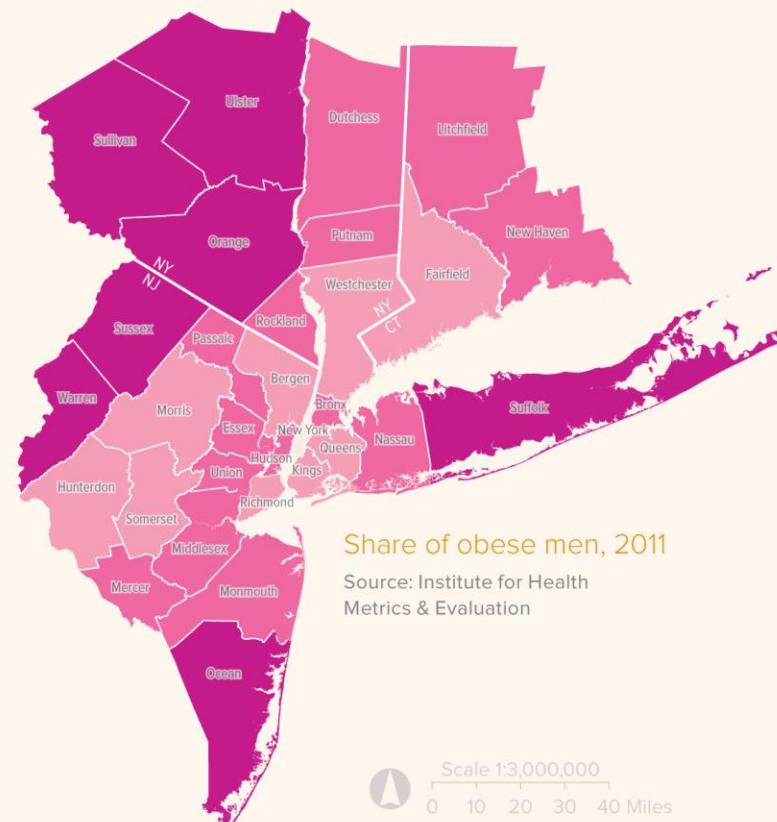
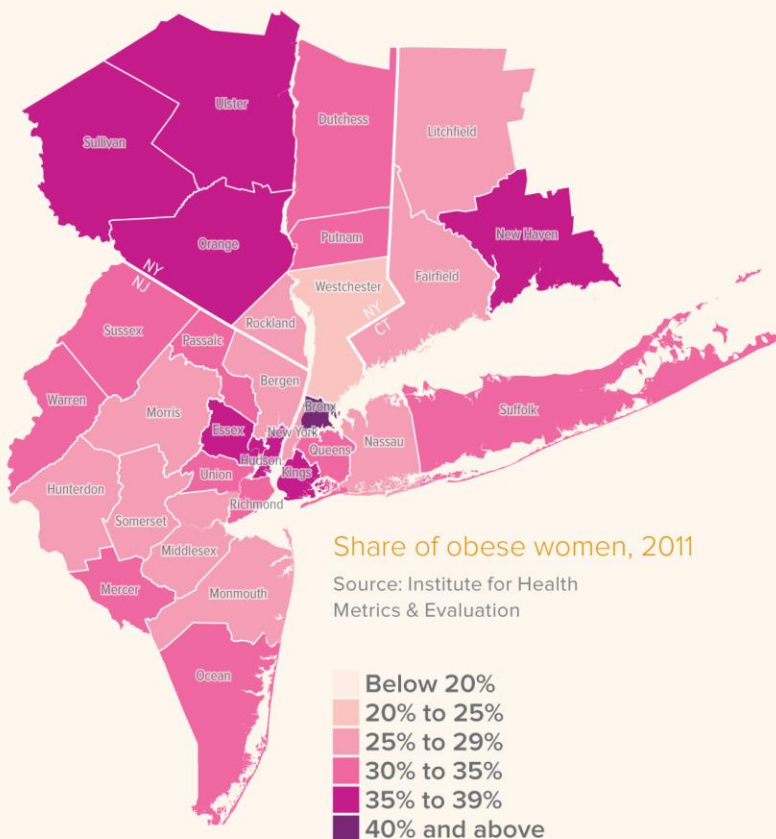
PAYOFFS HIGHEST IN MORE WALKABLE COUNTIES

While life expectancy has increased overall, New York City in particular has seen impressive gains.



OBESITY RATES GENERALLY HIGHEST IN COUNTIES FURTHEST FROM MANHATTAN

There are big disparities in obesity rates between different counties.

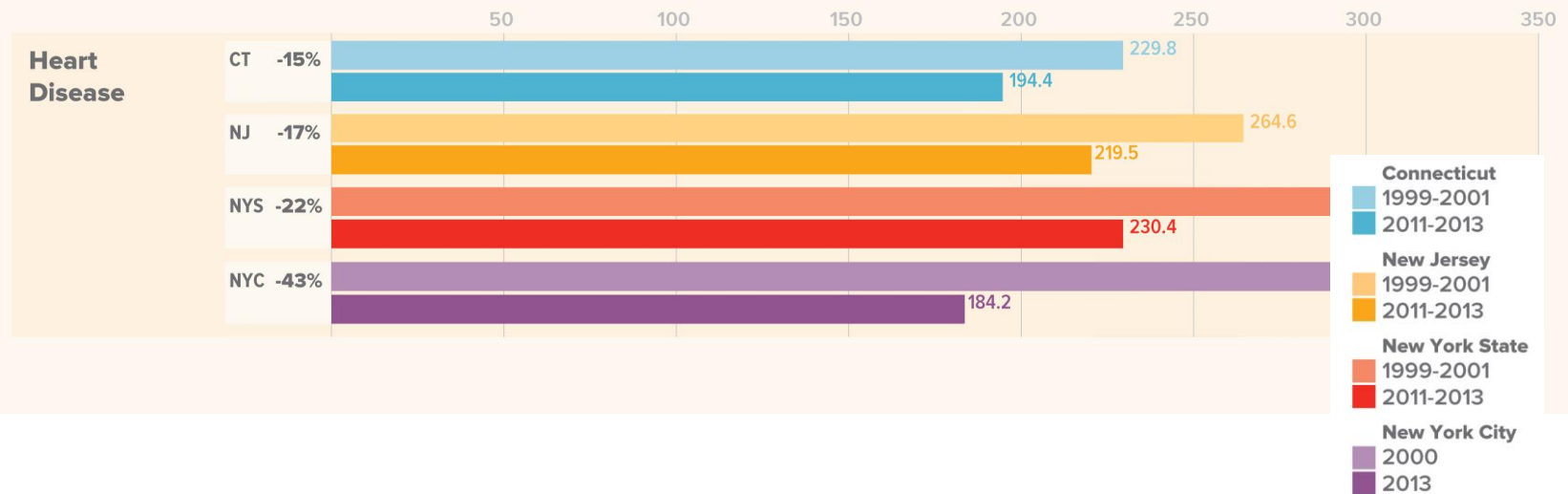


HEART DISEASE DEATHS DROP THROUGHOUT METRO AREA

The last decade saw a drop in mortality from many chronic diseases in Connecticut, New Jersey and New York.

Change in mortality rates per 100,000 people

Sources: Centers for Disease Control and Prevention, New York City Department of Health and Mental Hygiene



ENCOURAGING ACTIVE TRANSPORTATION

- Dense cities with mixed land-use generate short trips
- Safe, convenient cycling including bike parking
- Connected, direct, and pleasant sidewalks and paths
- Traffic systems and designs with pedestrians and cyclists in mind
- Good transit
- Coordinate transit, cycling, and walking
- Laws and enforcement to protect peds + bikes > cars
- Education programs (public health + planning community)
- Equitable cost of transportation by mode
- Start young; encourage walk-to-school and “free-range kids”
- Safety from crime (Good lighting, defined paths, in some cases well-patrolled, removal of obstacles, etc.)

ROAD TRANSFORMATIONS: MELROSE AVENUE WEST HOLLYWOOD, CA



ROAD TRANSFORMATIONS: SPRING GARDEN STREET PHILADELPHIA, PA



ROAD TRANSFORMATIONS: FOWLER AVENUE TAMPA, FLA



E Fowler Ave at Spectrum Blvd/McKinley Dr

Existing Condition

ROAD TRANSFORMATIONS: FOWLER AVENUE

TAMPA, FLA



E Fowler Ave at Spectrum Blvd/McKinley Dr

Potential Condition

NOT JUST AN EAST/WEST COAST PHENOMENON

Metropolitan Share of Non-Car Commuters, 2007 to 2013

Boise



Grand Rapids



Fargo



Dallas



AND EVERY CITY, IT SEEMS, WANTS A TECH HUB



metrorevolution.org

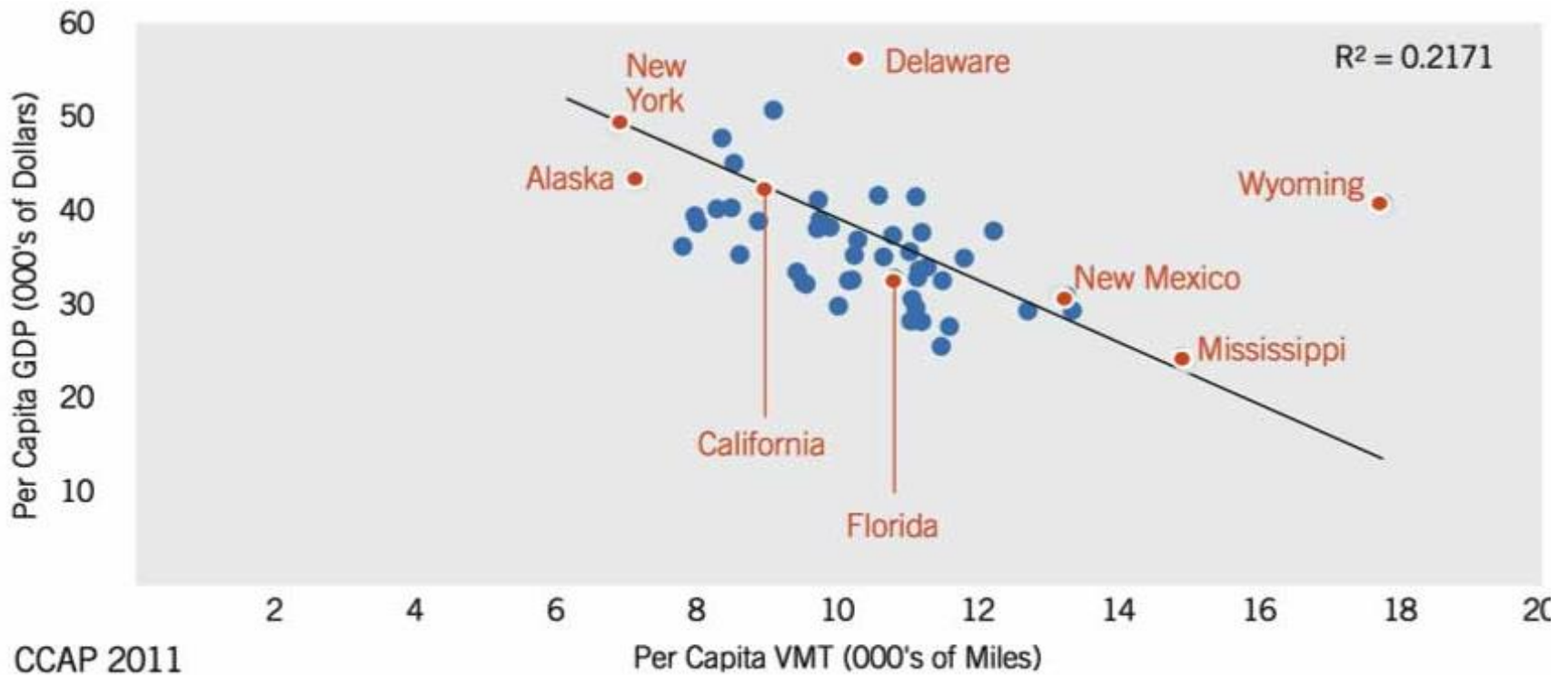
AND EVERY CITY, IT SEEMS, WANTS A TECH HUB



metrorevolution.org

GDP INVERSELY RELATED TO VMT

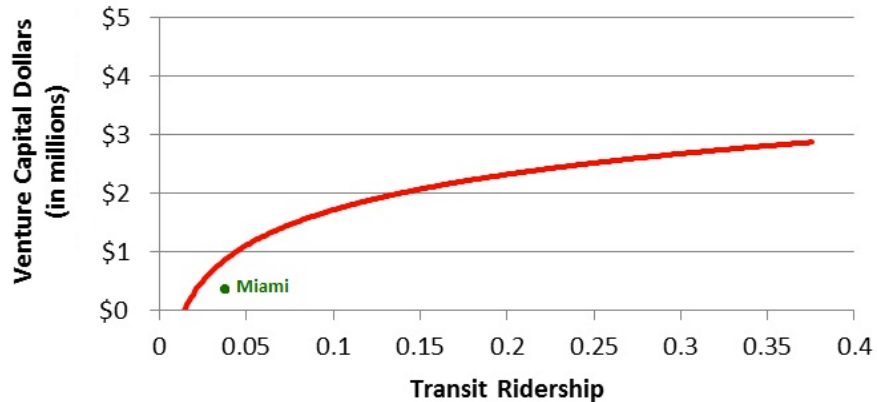
Per Capita GDP and VMT for US States



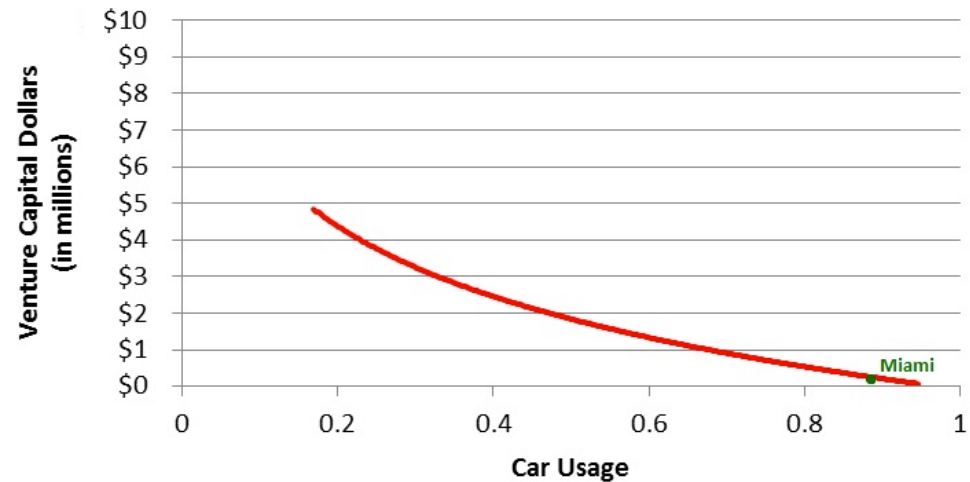
Source: "Smart growth and better transit can grow wealth," Houston Tomorrow, 24 January 2011.

VENTURE CAPITAL INVESTMENT POSITIVELY CORRELATES WITH TRANSIT RIDERSHIP

Transit Ridership to VC Investment (Metro Pop. 2mil - 8mil)



Car Usage to VC Investment



Source: "Transit in the Start-Up City, Part 2," Transit Miami, 10 September 2013.

WHAT DOES IT ALL MEAN?

With 20% Fewer VMT in the USA Annually:

- 7,000 fewer road deaths, 700,000 fewer injuries
- 94 gallons of gas per capita not consumed, 30 million gallons of gas not consumed total
- 1,429 tons CO2 per capita not released, 22.8 million tons CO2 total not released
- Z healthier citizens, X fewer cars bought
- \$Y saved/vehicle mile shifted to active transportation
- Cities grow in population
- Livable cities become magnets where GDP soars

Sources: "Evaluating Active Transport Benefits and Costs," Victoria Transport Policy Institute, 24 April 2014; "Individual Emissions Calculator Methodology," Travel Matters; "Fatality Analysis Reporting System Encyclopedia," National Highway Traffic Safety Administration.

TUXEDOS ON THE SUBWAY

Transit systems “get fully funded when used by both the well-to-do and the not-doing-so-well.” A system viewed as ‘for the poor’ will be poorly maintained.

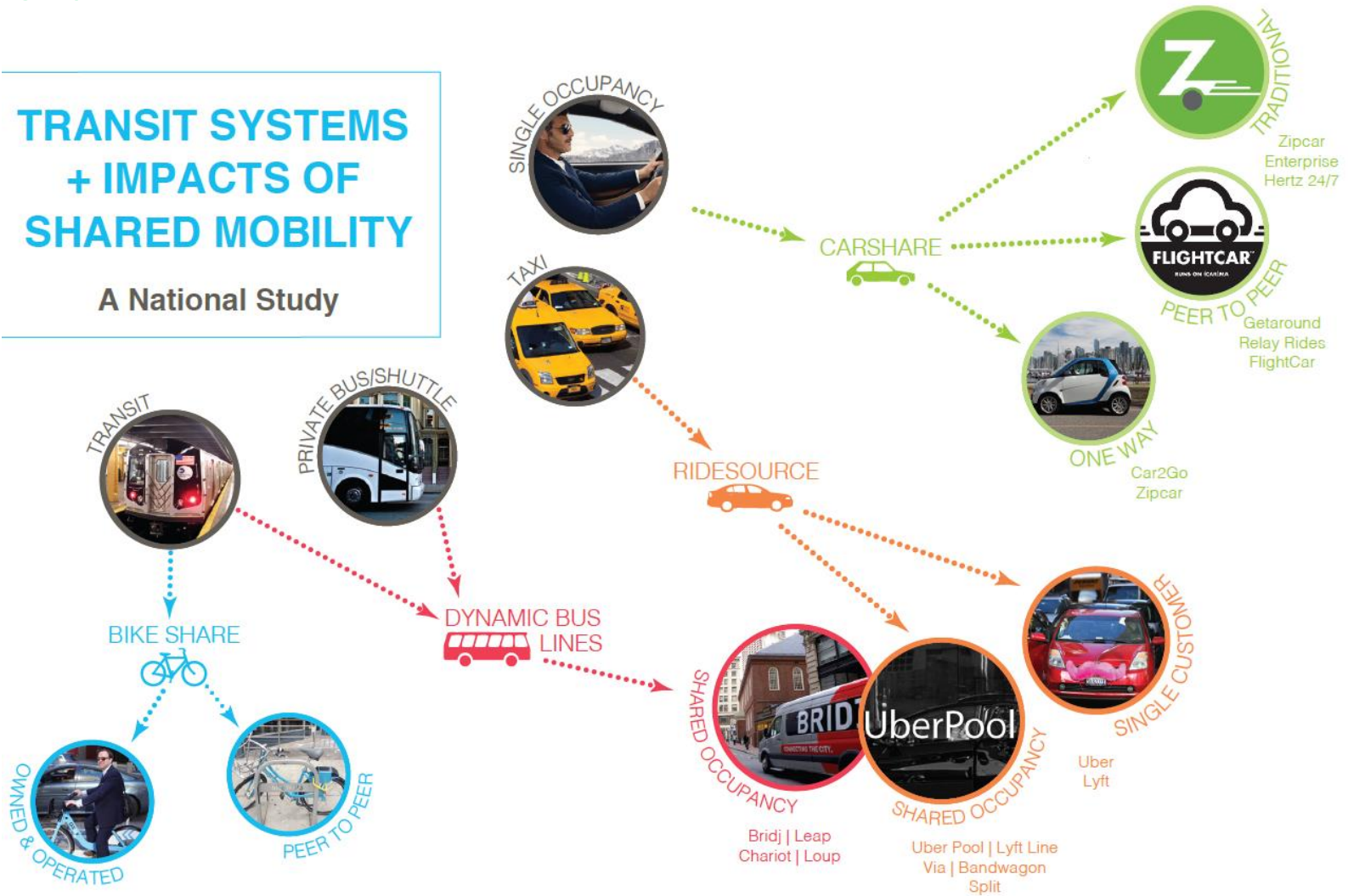


Source: “Street Smart, the Rise of Cities and the Fall of Cars” Samuel I. Schwartz, September 2015.

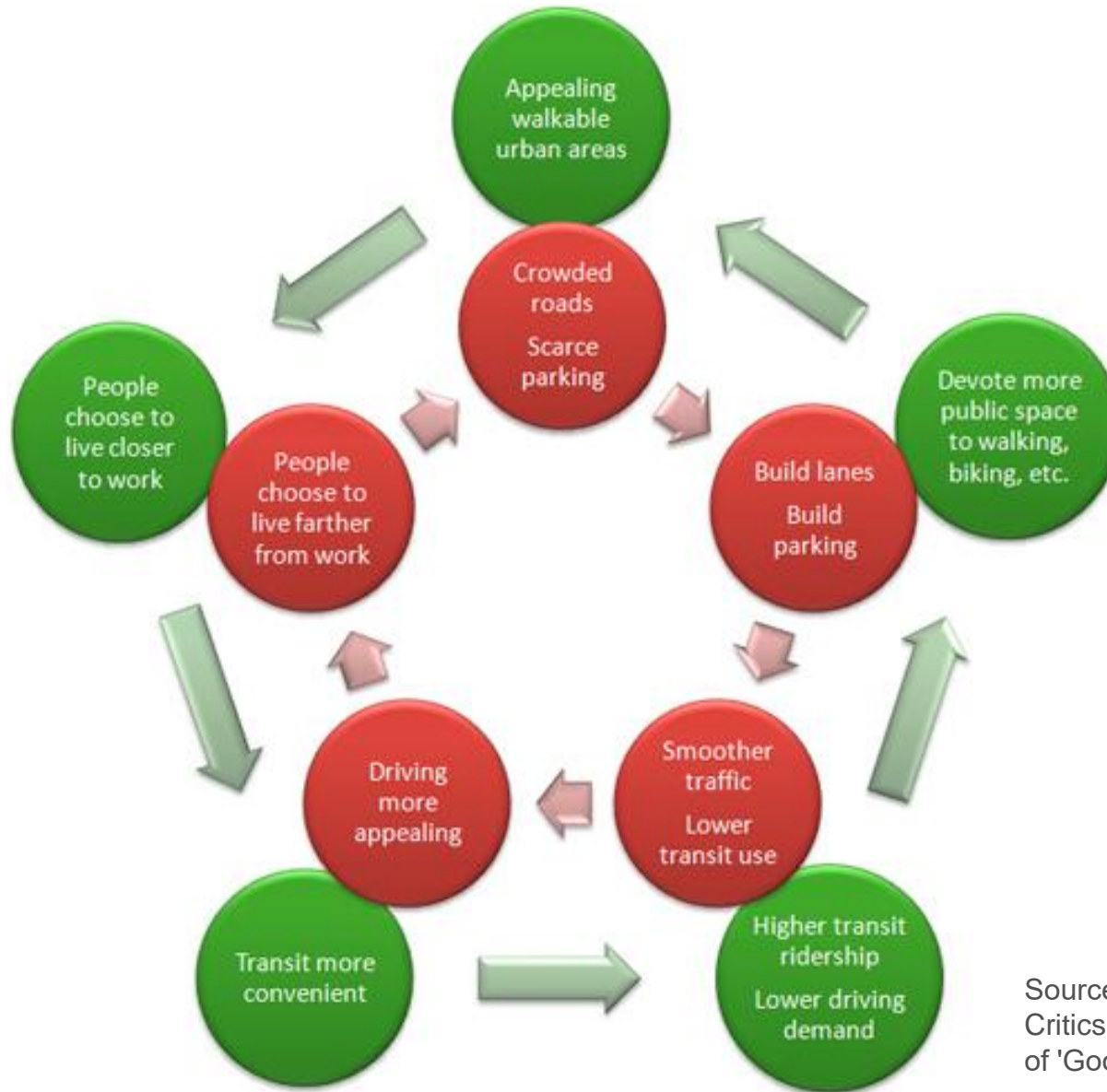
2016

TRANSIT SYSTEMS + IMPACTS OF SHARED MOBILITY

A National Study

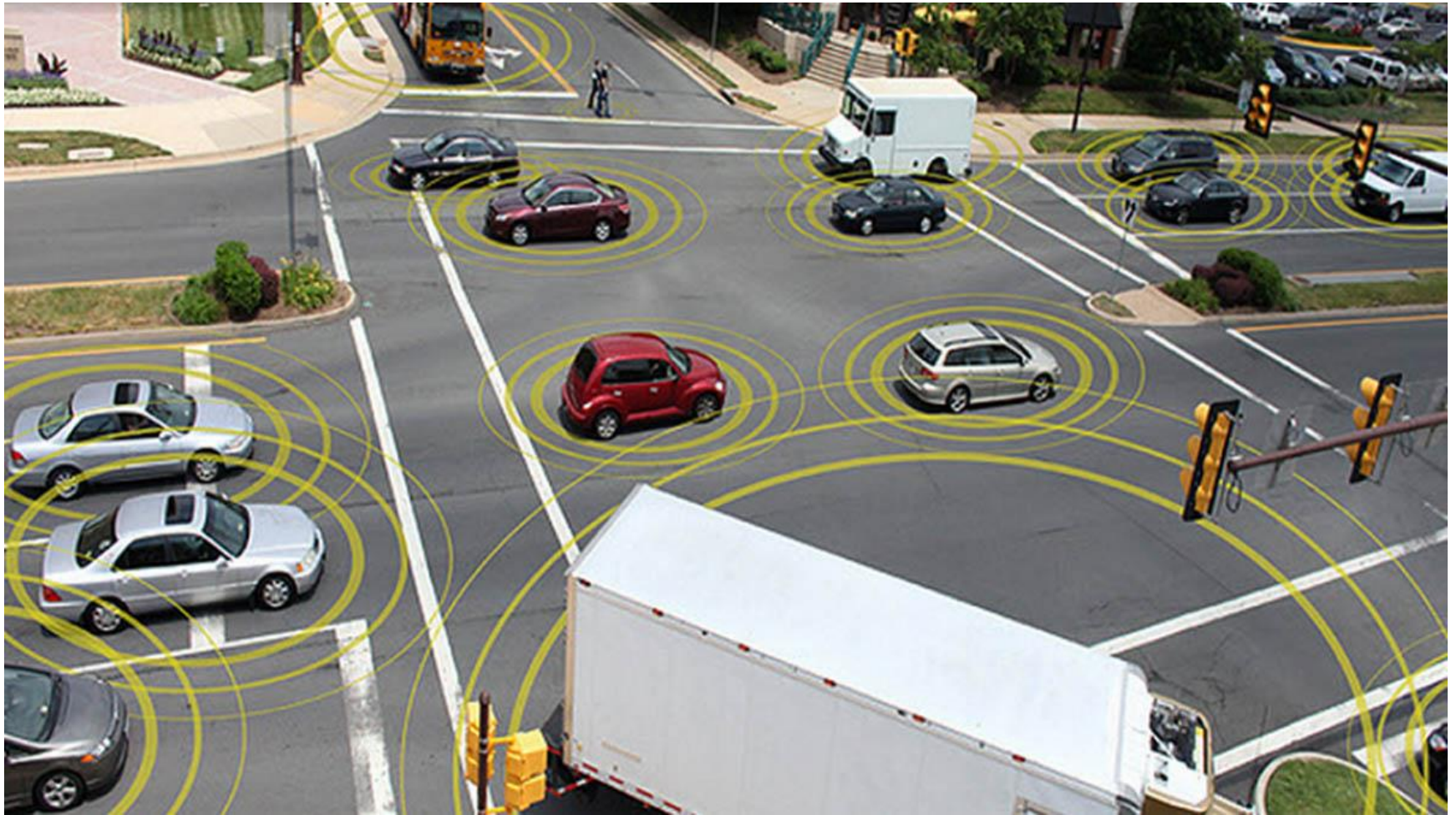


CONCLUSION: PLANNERS AND ENGINEERS HAVE A CHOICE



Source: David Alpert, "Hey, Streetcar Critics: Stop Making 'Perfect' the Enemy of 'Good,'" City Lab, 1 October, 2014

THE NEXT FRONTIER-AUTONOMOUS VEHICLES



THINK UBER WAS DISRUPTIVE?

Wait Till Autonomous Cars Arrive in a Neighborhood Near You



Samuel I. Schwartz, P.E.
Institute of Transportation Engineers

August 15, 2016

**Sam
Schwartz**

Transportation
Consultants

PROMISES OF AUTOISTS

1900 Dawn of the Auto



Dispense with a horse and save the expense, care and anxiety of keeping it.
The Winton Motor Carriage Company

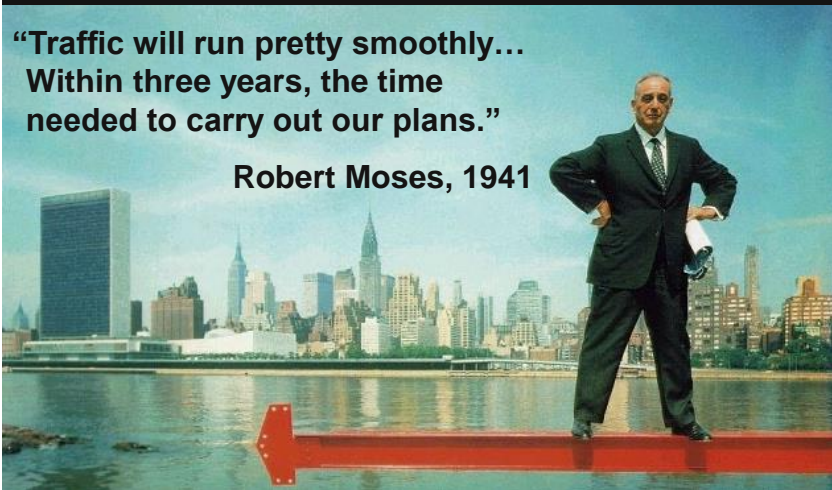
1920s Modernist Era



“The city of tomorrow will be an automotive city.”

Miller McClintock

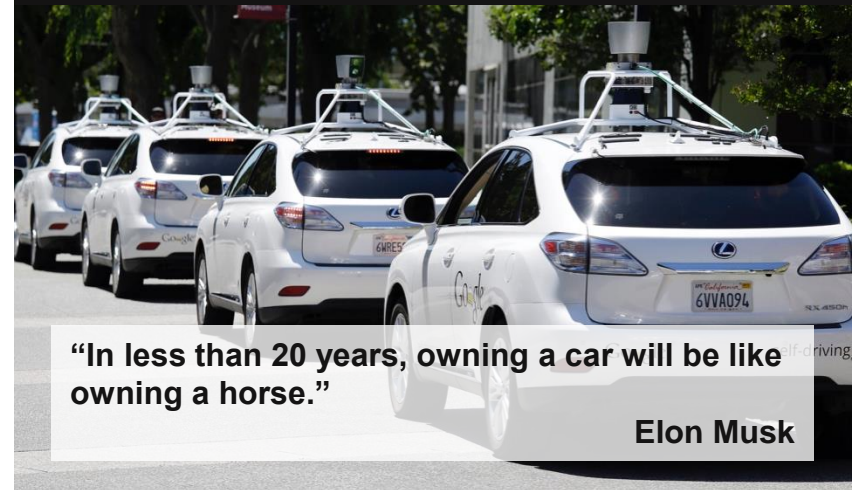
1940s Sprawl + Interstate Era



“Traffic will run pretty smoothly...
Within three years, the time
needed to carry out our plans.”

Robert Moses, 1941

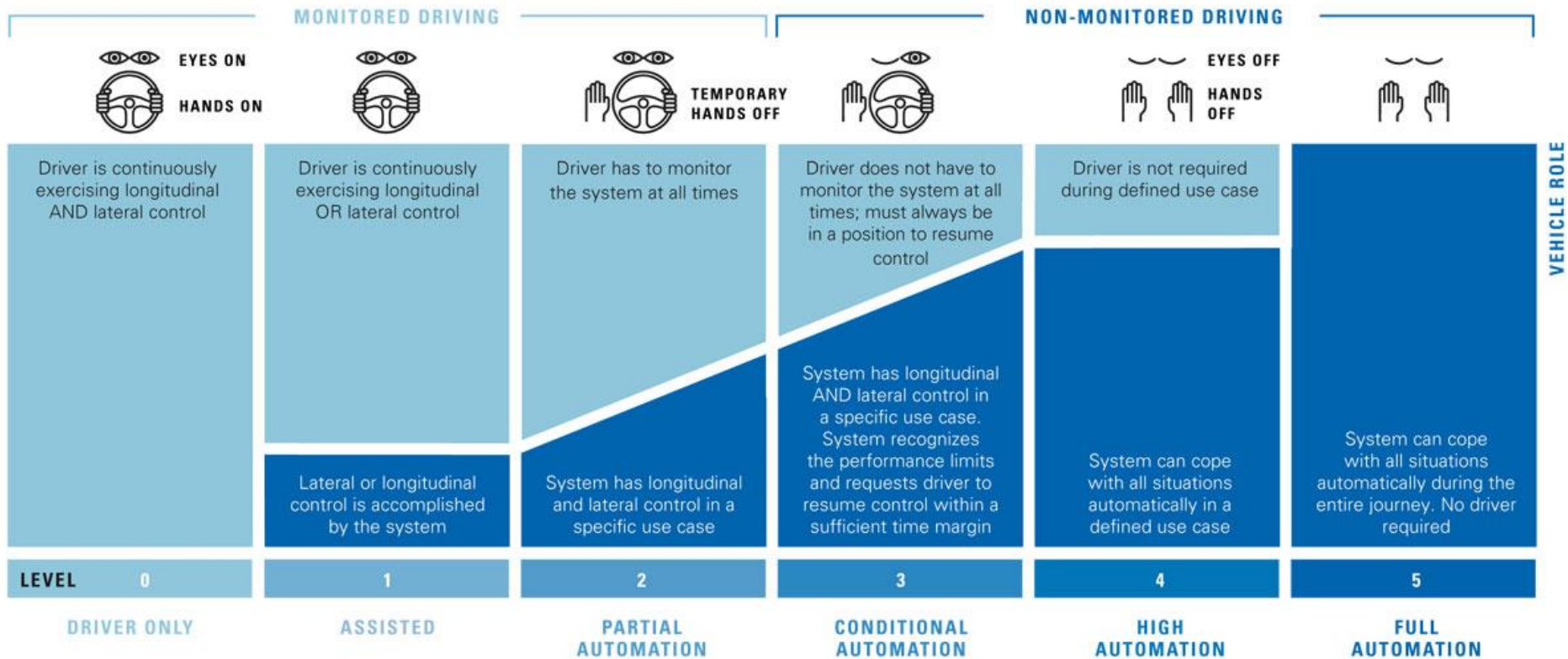
2016 Dawn of Autonomous Vehicles



“In less than 20 years, owning a car will be like
owning a horse.”

Elon Musk

STAGES OF AUTONOMY



Mike Lemanski

THE GOOD, THE BAD AND THE UGLY (POSSIBILITIES)

the GOOD

- Congestion diminishes
- Crashes, injuries, and deaths plummet
- Disabled well-served
- Last mile solved
- Parking demand goes way down

the BAD

- VMT soars & congestion increases
- Many jobs disappear
- Peds, bikes squeezed out
- Unaffordable for poor and rural dwellers
- Reverses millennial trend eschewing driving

and the UGLY

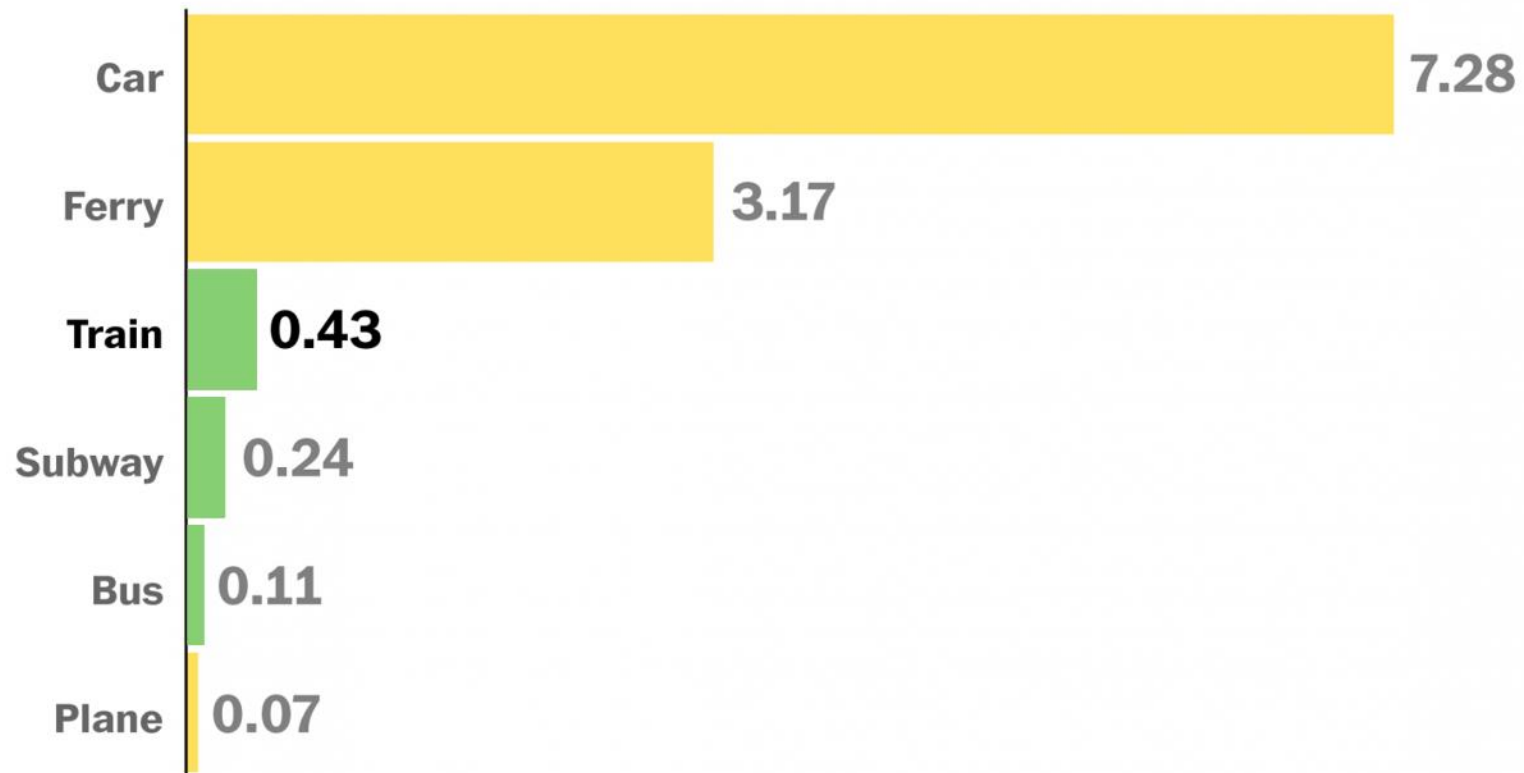
- Public transportation decimated
- Cardio/stroke/diabetes sky rocket
- Everybody gets a license (even your dog)
- A new “modernist” view of cities
- Encourages sprawl

THE GOOD – MUCH SAFER



THE GOOD – MAY BE 90% SAFER THAN CARS

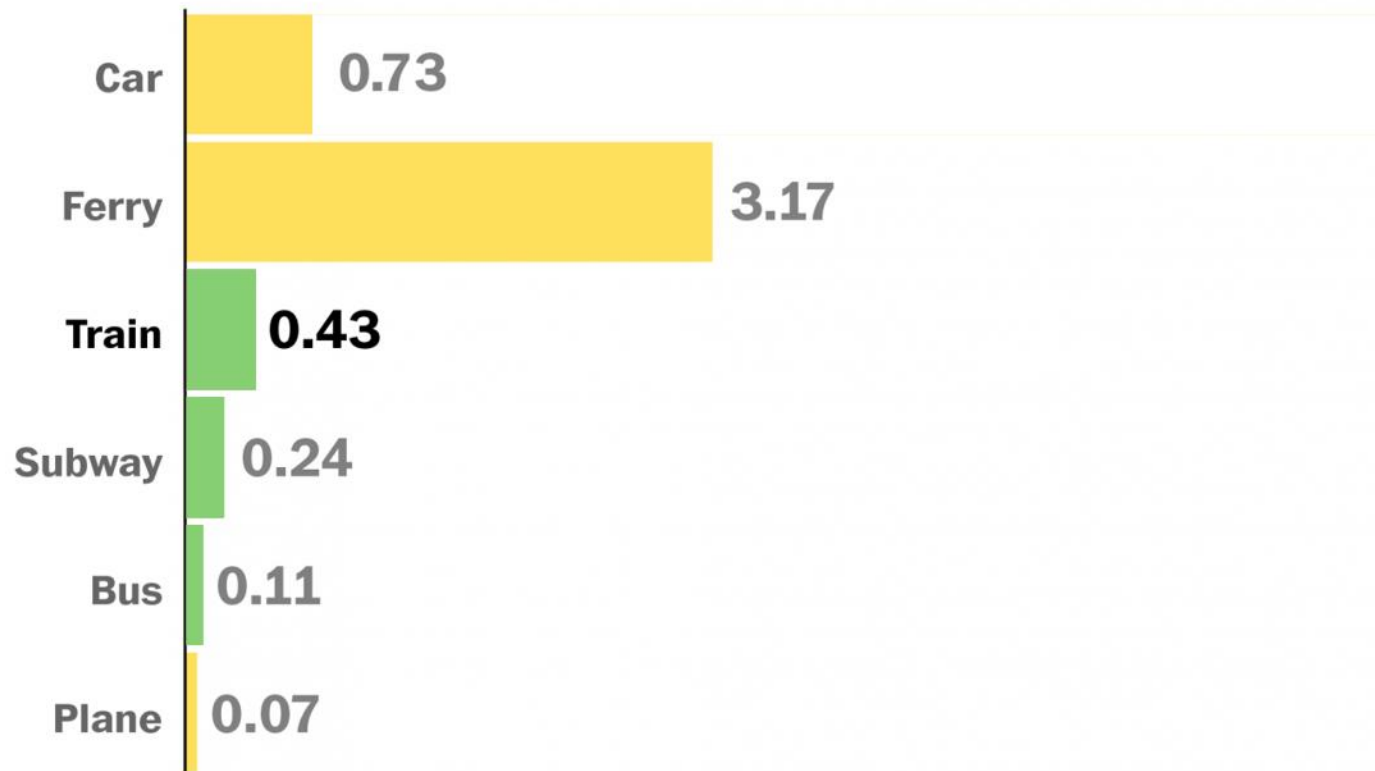
Passenger deaths per 1 billion passenger miles, 2000 to 2009



THE GOOD – MAY BE 90% SAFER THAN CARS

But Transit is Already 95% Safer

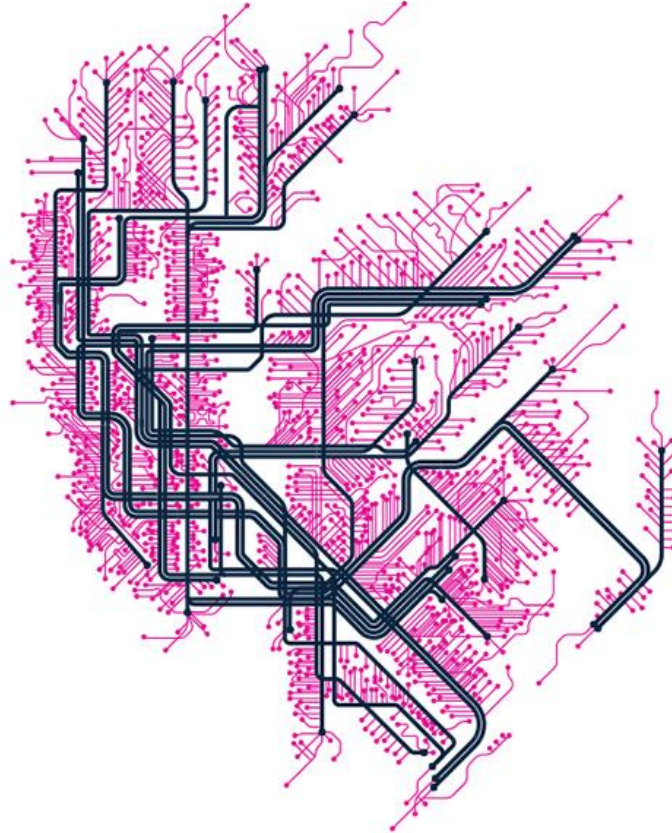
Passenger deaths per 1 billion passenger miles, 2000 to 2009



THE GOOD – IMPROVED LAST MILE FOR TRANSIT ACCESS



**ONE GAJILLION
NEW STOPS.**



↓ 🚗 DOWNLOAD & RIDE



THE GOOD – SHARP REDUCTION IN PRIVATELY OWNED CARS

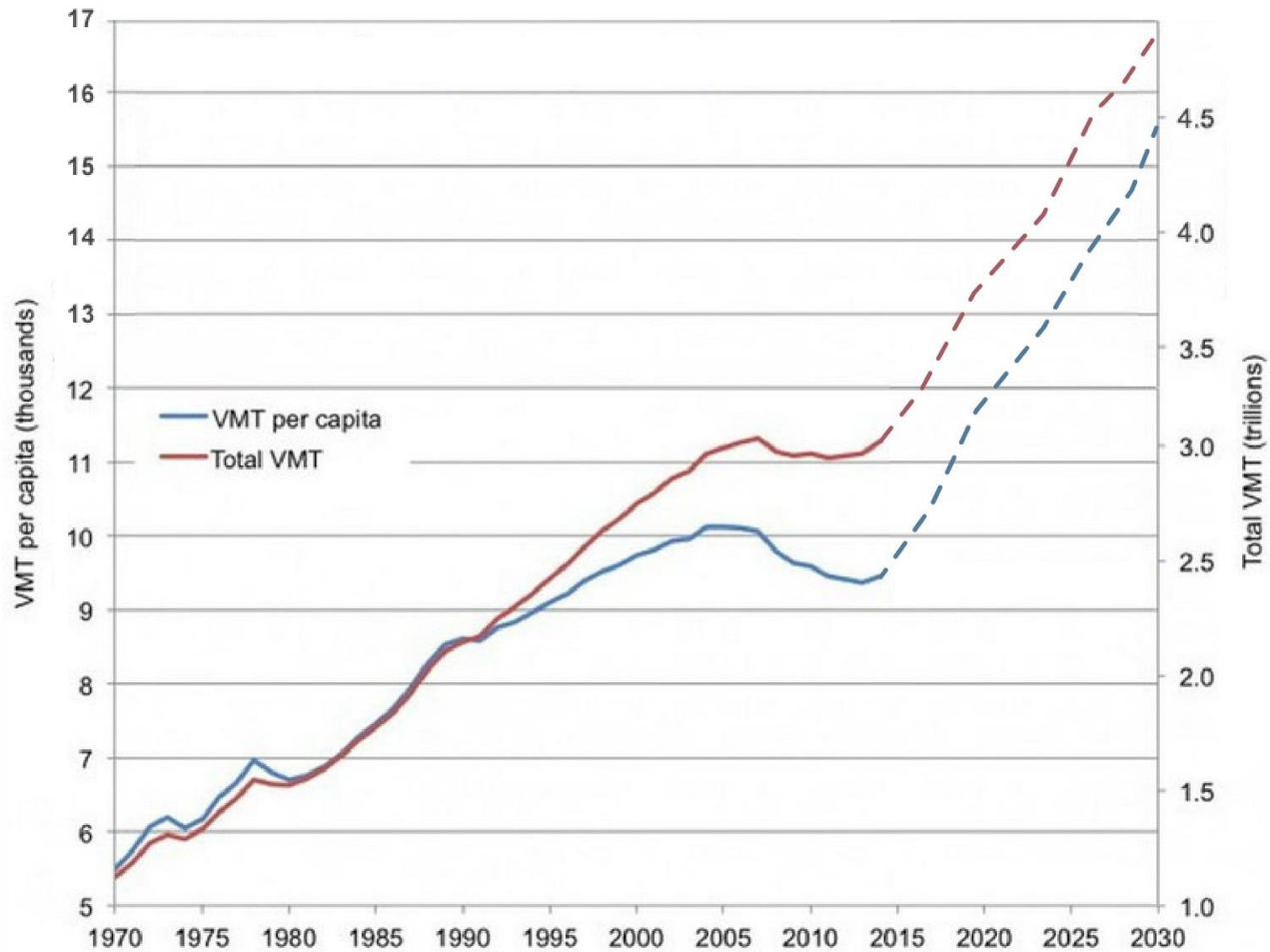
Potential Vehicle Reduction with AVs



When Mobility as a Service includes the option of Ridesource AVs, there is great potential for a reduction in privately owned single occupancy vehicles.

THE BAD – VMT SOARS

Total and Per Capita Vehicle Miles Traveled (VMT) 1900 - 2030



Annual vehicle-miles traveled (VMT), total and per capita, in United States.

THE BAD – CONGESTION REMAINS AWFUL



Life without driverless cars

Life with driverless cars

All hail the revolution!

**COPENHAGEN
IZE
EU**
Design Co.

THE UGLY – MORE INACTIVITY: A LEADING CAUSE OF DEATH

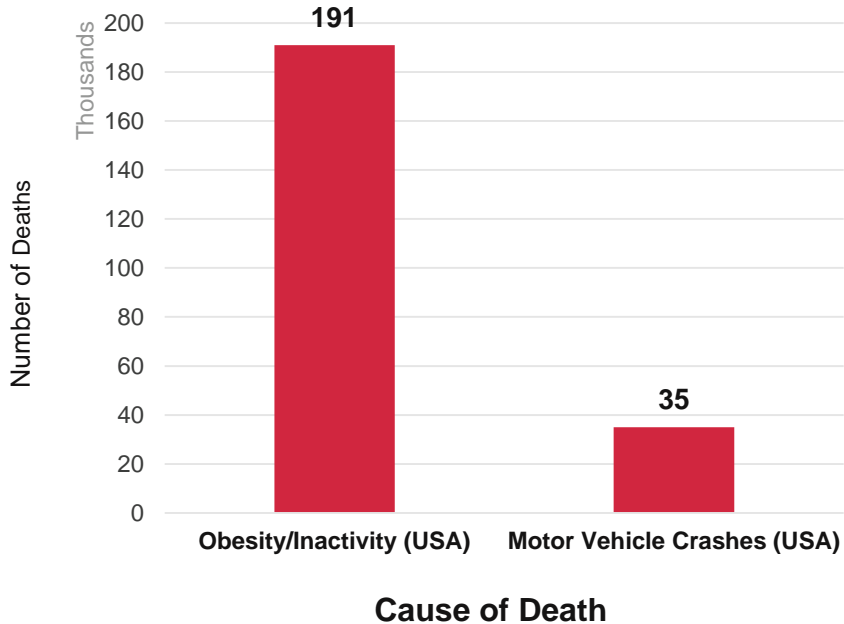
“The leading causes of death aren’t infections or accidents, but non-communicable diseases like diabetes, stroke and cardiovascular disease.... and probably 80% of all preventable deaths. A sizeable chunk ... is due to inadequate exercise...”

- *Street Smart: The Rise of Cities and The Fall of Cars*, based on interview with Dr. Karen Lee

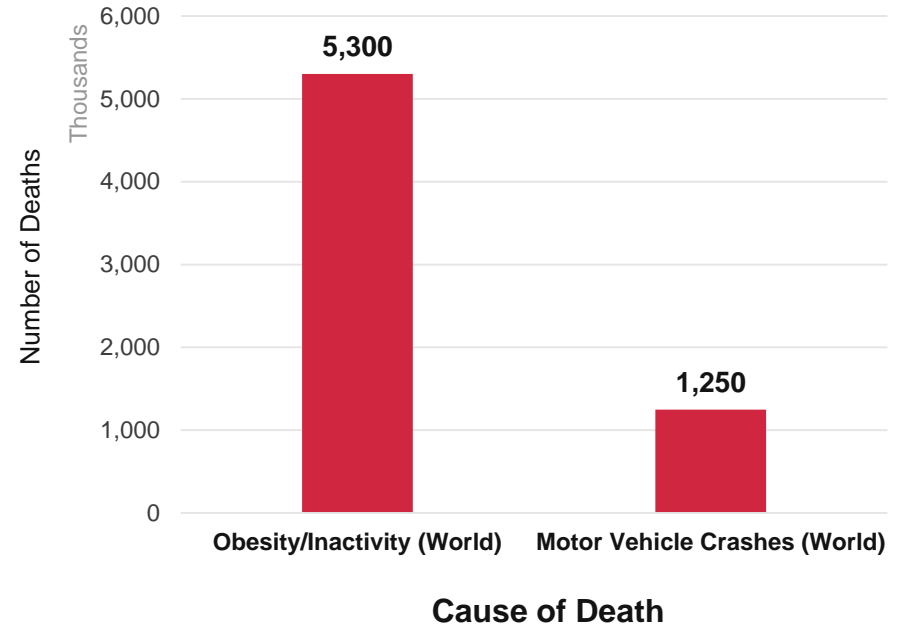


INACTIVITY TAKES MORE LIVES THAN CRASHES

USA Deaths (Inactivity vs. Crashes)



World Deaths (Inactivity vs. Crashes)



Sources:

NHTSA, 2015

PLOS Medicine, 2005

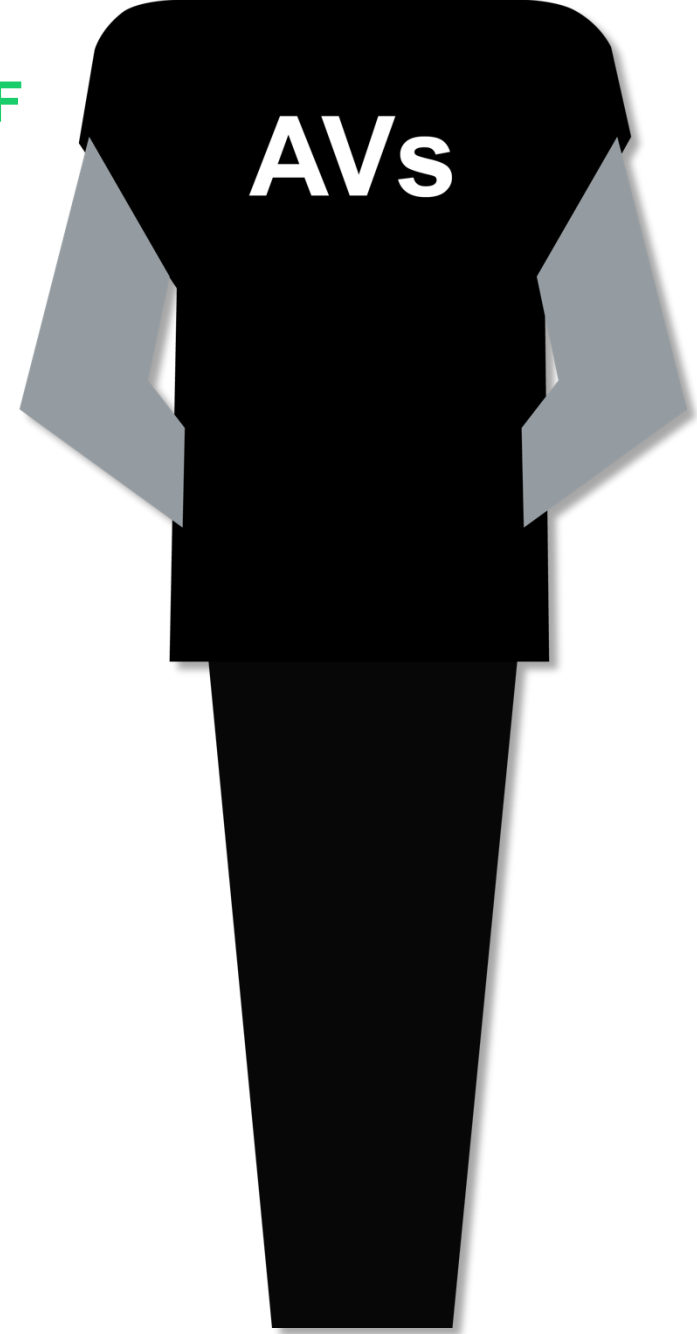
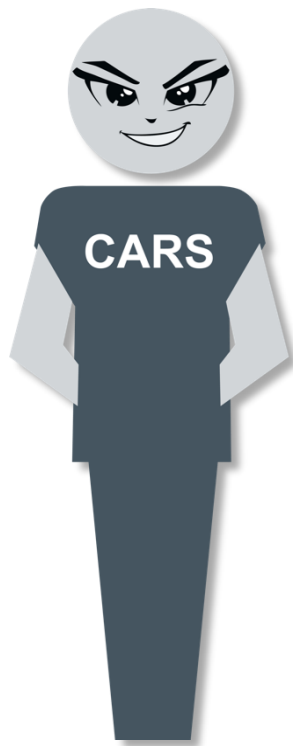
WHO, National Safety Council, 2013

The Lancet, 2008

THE UGLY – WALL-E



THE UGLY – OVERSIZED INFLUENCE OF

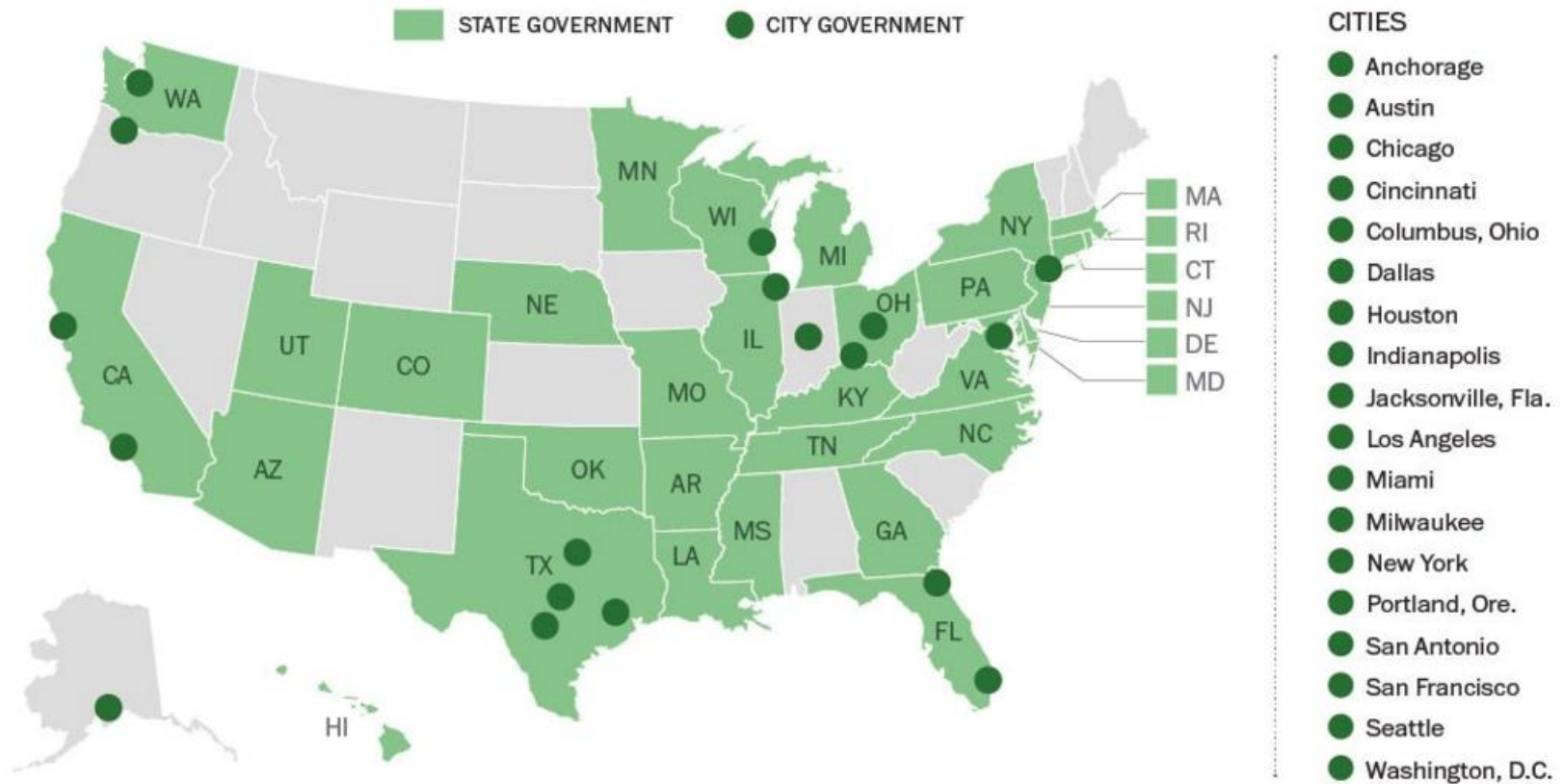


WE WERE CAUGHT FLAT-FOOTED BY UBER ET AL.

Uber's Lobbying Empire Extends From Coast To Coast

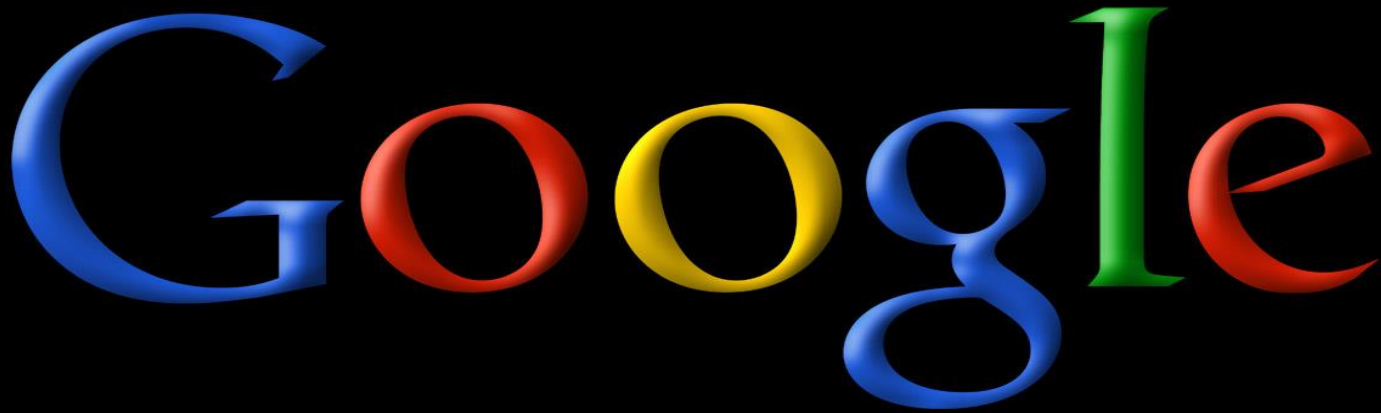
Over the past two years, Uber has hired an armada of contract lobbyists, vacuuming up some of the most skilled and politically connected representatives in at least 50 U.S. cities and states. The company will not release a full list of its lobbyists, but public records show lobbyists have registered on Uber's behalf in the following places, likely an underestimate of the company's full lobbying strength.

82b



City and state lobbyist disclosure records | By The Washington Post December 14, 2014

GOOGLE INVESTING IN UBER

A 3D rendering of the Google logo, featuring the letters 'G', 'O', 'O', 'g', 'l', 'e' in blue, red, yellow, blue, green, and red respectively. The letters are thick and have a slight shadow, giving them a three-dimensional appearance against a black background.

GOOGLE INVESTING IN UBER



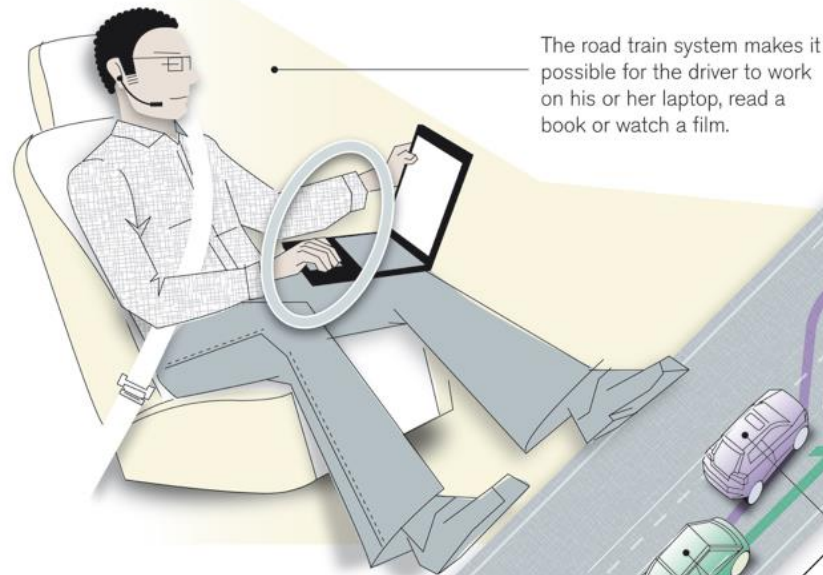
GOOGLE INVESTING IN UBER



TRANSIT STRATEGIES

Join a road train

A safe and energy-efficient way to travel



The road train system makes it possible for the driver to work on his or her laptop, read a book or watch a film.

6-8 vehicles
in each convoy

- Don't believe the hype on road *trains*
- Maintain good existing systems
- Use AVs for last mile transport
- Prepare transit workers for work in AV transit

AVs DON'T CHANGE THIS EQUATION MUCH

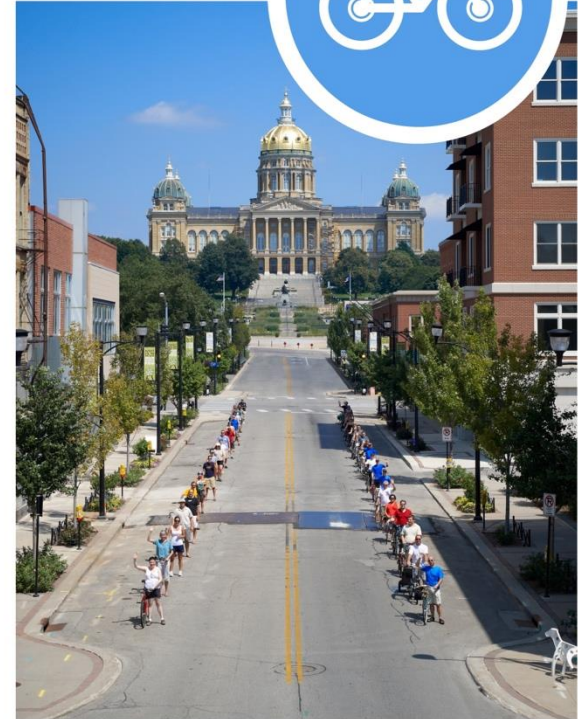
40 by



40 by



40 by



Amount of space required to transport the same number of passengers by car, bus, or bicycle.

Event info at www.facebook.com/Urban.Ambassadors - Photos by www.tobinbennett.com

(Des Moines, Iowa - August 2010)

SO WHAT SHOULD WE DO?

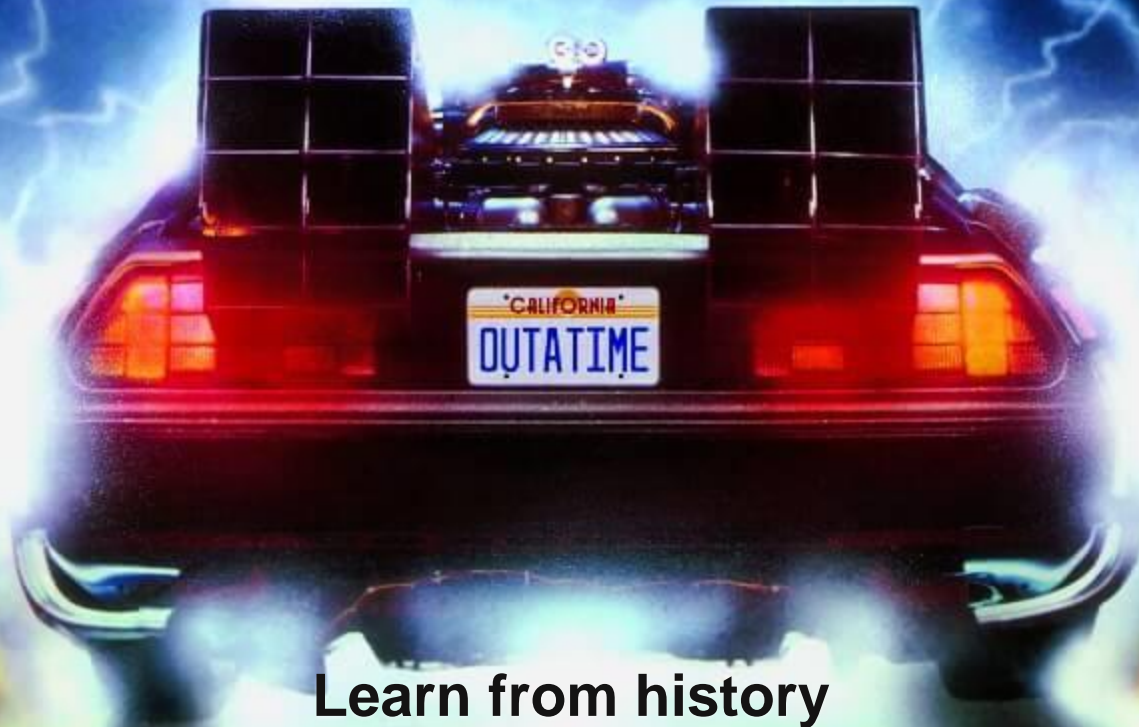
Government and Society Should Get Ahead of the Curve

- Discourage private ownership, incentivize shift to transportation as utility
- Maintain and support effective *mass* transit
- Emphasize last mile in sprawl areas and transit deserts
- Ensure system equity for low income, disabled, and elderly
- Utilize congestion pricing & TDM to maintain adequate mobility
- Prioritize lighter, smaller, lower energy, and less polluting vehicles
- Don't mess with bike/ped growth in cities
- Reallocate parking for better use
- Apply appropriate taxes and fees
- Enact legislation and enforcement policies preemptively
- Promote full airing of ethics
- Humanize street design: widen sidewalks, don't add lanes
- Identify and address workforce impacts

CONCLUSION

“Your future is whatever you make it, so make it a good one.”

Emmet “Doc” Brown, Back to the Future



**Learn from history
Be wary
Plan for the Future**



www.samschwartz.com

New York + Jersey City + Chicago + Washington D.C. + Tampa + Los Angeles