

A man in a dark suit and glasses is lying face down on a yellow double line in a parking lot. The background shows a clear blue sky, some commercial buildings, and streetlights. The overall scene is dimly lit, suggesting dusk or dawn.

# Confessions of a Recovering Engineer

TRANSPORTATION FOR A STRONG TOWN

Charles L. Marohn, Jr. | Civil Engineer, Urban Planner, Author  
@clmarohn | @strongtowns | [www.strongtowns.org](http://www.strongtowns.org)



Civic Center  
Hill Street

SOUTH  
Downtown

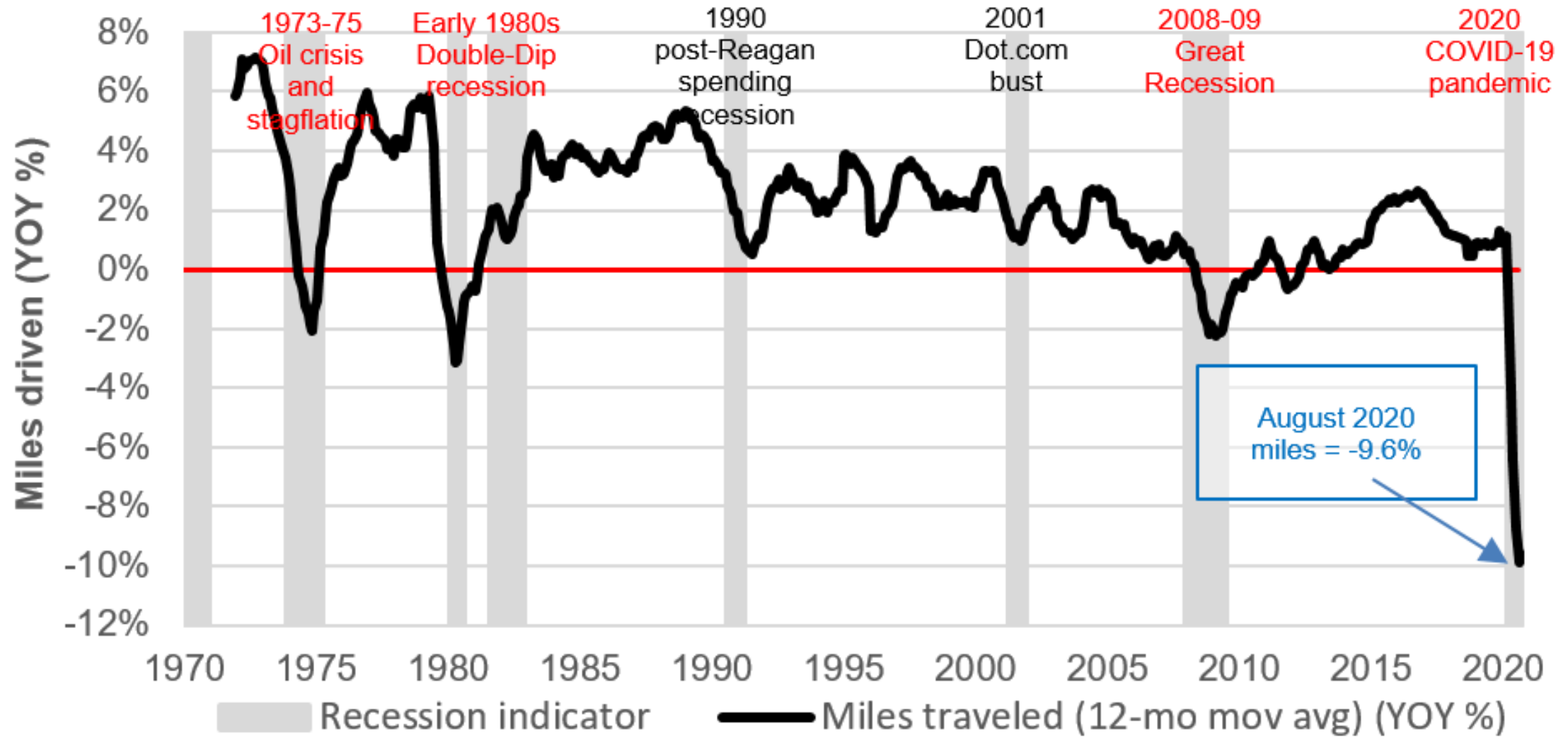
Stadium Way  
Dodger Stadium

15

EXIT  
25

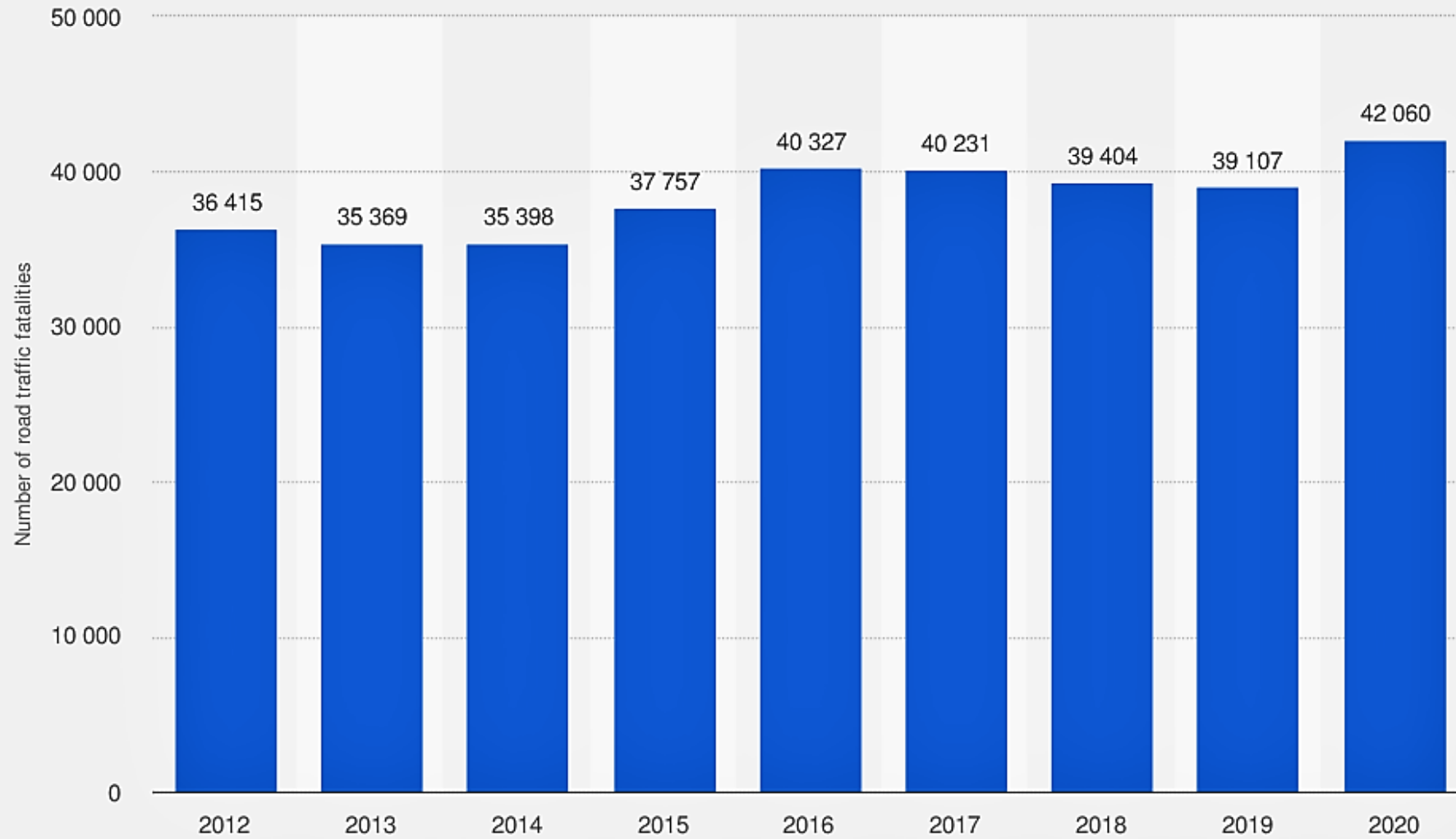
# Vehicle miles traveled before and after recessions

(Year-over-year % change in 12-month moving average of miles)



Source: FHA; NBER; RSM US

## Number of road traffic fatalities in the United States from 2012 to 2020



### Sources

National Safety Council; NCHS  
© Statista 2021

### Additional Information:

United States; National Safety Council; NCHS; 2012 to 2020

How do we explain this?



The  
Reckless  
Driver™

← NEWS

# 2020 Fatality Data Show Increased Traffic Fatalities During Pandemic

Risky Driving Behaviors Including Failure to Wear a Seatbelt, Speeding, and Drinking While Driving Identified as Contributing Factors

# *Pedestrian Deaths Spike in U.S. as Reckless Driving Surges*

Fatalities are climbing to record levels two years into the pandemic. Authorities cite drivers' anxiety levels, larger vehicles and fraying social norms.





**It's not just your imagination. Drivers in the pandemic have gotten more reckless**



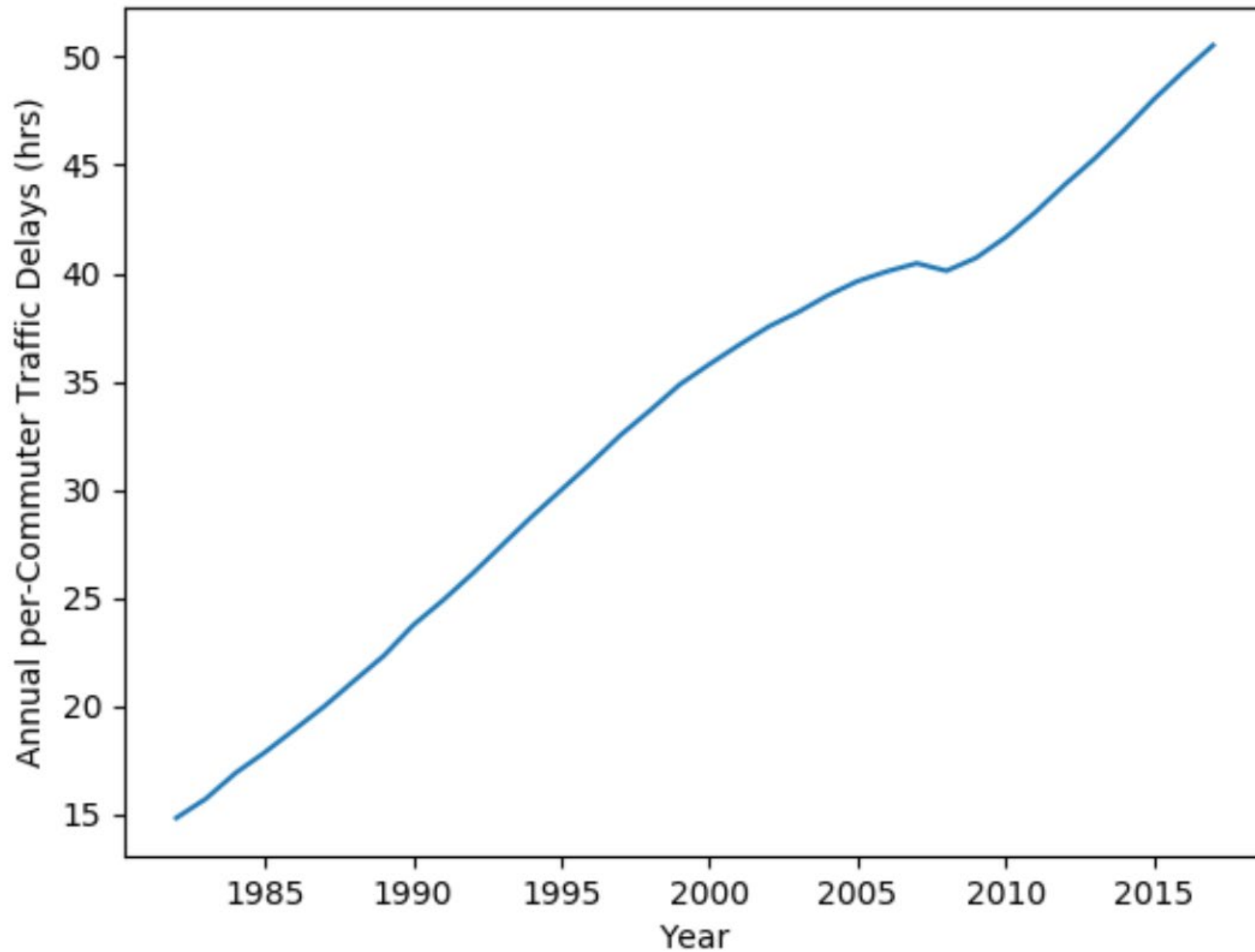
Car crash deaths have surged during COVID-19 pandemic. Here's why

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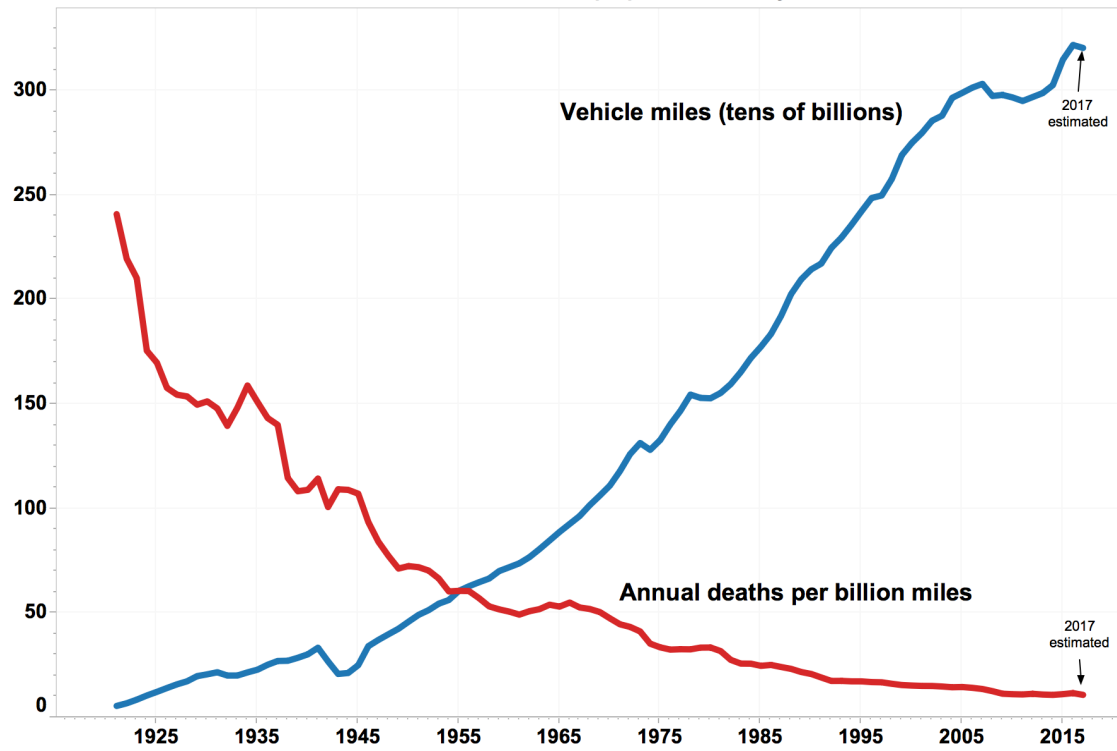
[Reckless driving is] “a sign of the overall lack of consideration we’re showing for other citizens, whether it be wearing masks, or not getting vaccinated, or how we drive.

It’s very aggressive. It’s very selfish.”

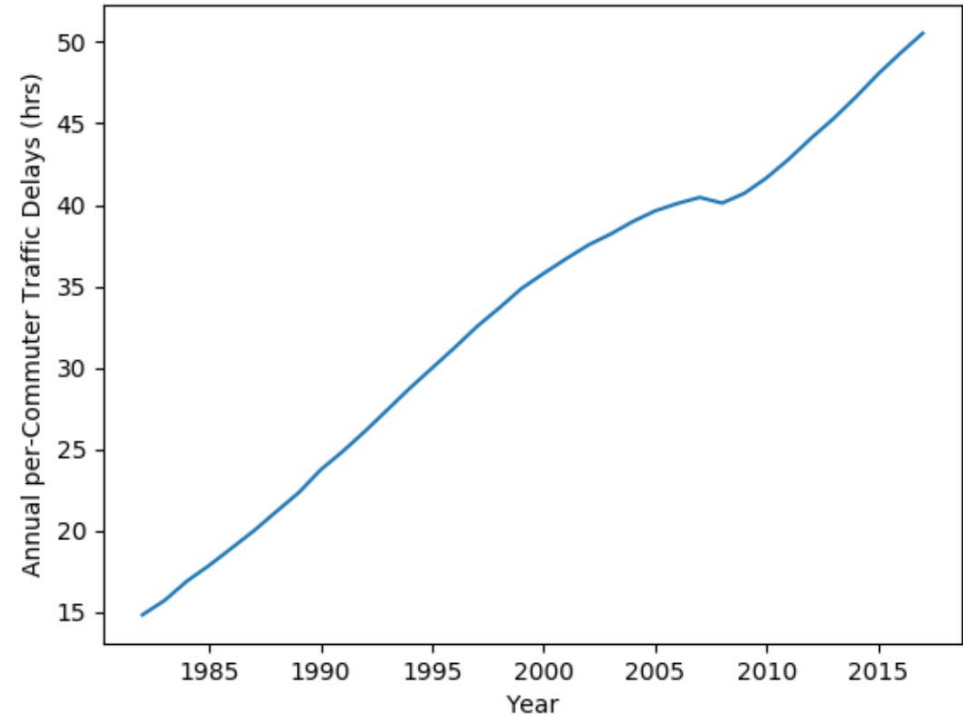
Average Annual per-Commuter Traffic Delays over Time



US vehicle miles traveled and propotionate fatality rate



Average Annual per-Commuter Traffic Delays over Time





# FORGIVING DESIGN



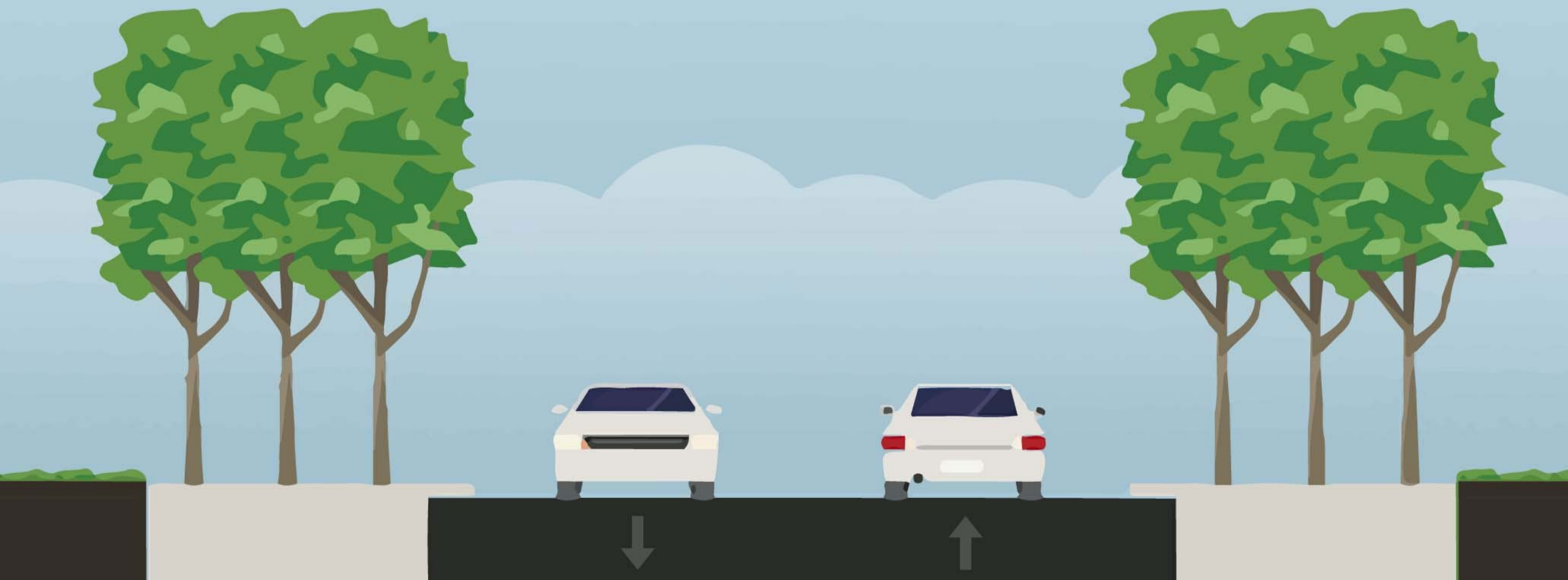
FORGIVE

# FORGIVING DESIGN

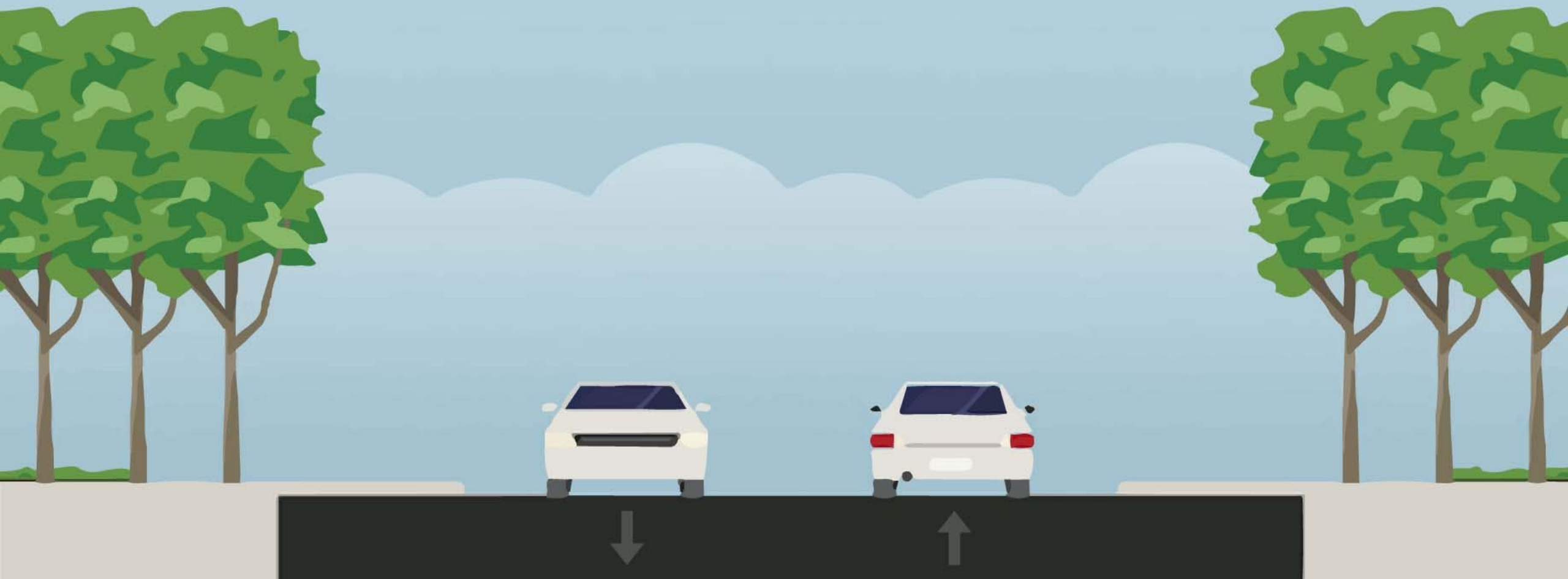




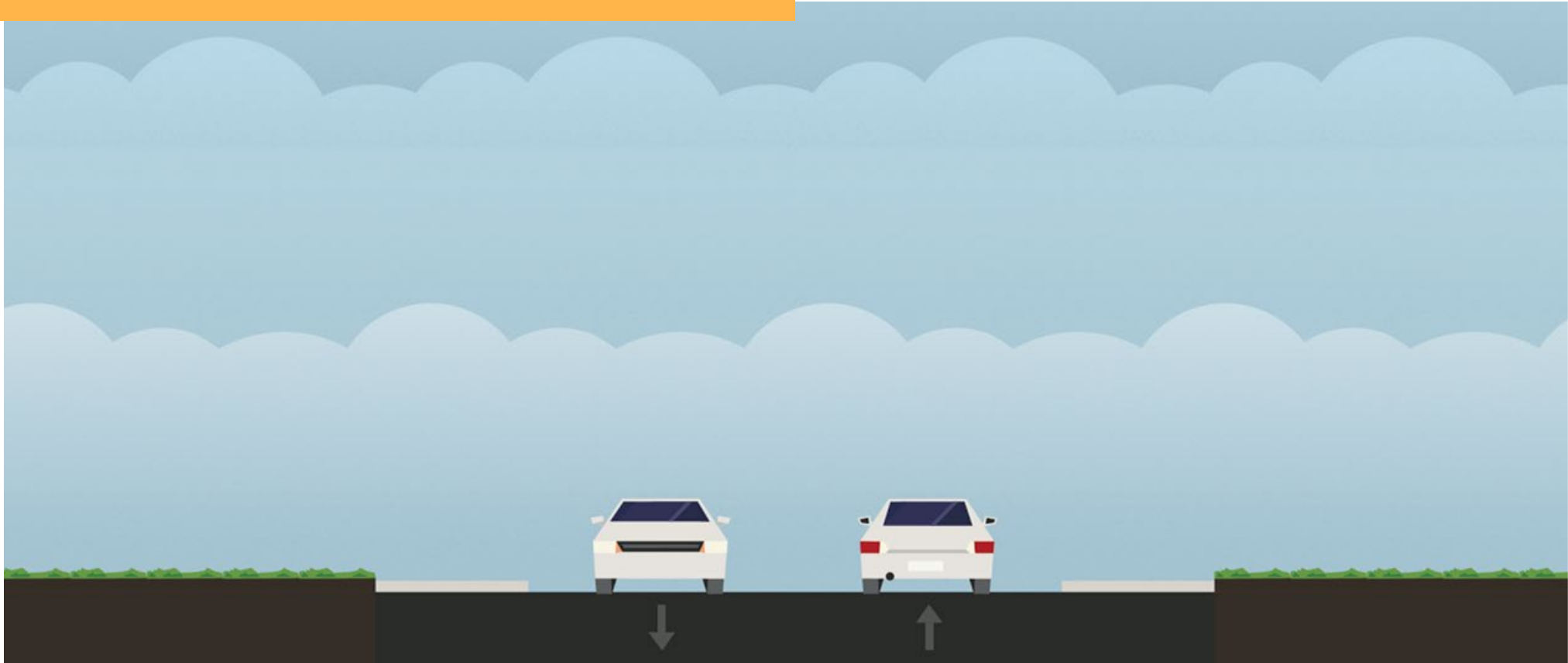
# FORGIVING DESIGN



# FORGIVING DESIGN



# FORGIVING DESIGN



# FORGIVING DESIGN



# Manual on Uniform Traffic Control Devices

for Streets and Highways

2009 Edition

## 225. Street – see Highway



SPEED  
LIMIT  
25

SHERIFF

45

YOUR SPEED



## SYSTEM 1

Intuition & instinct



Unconscious  
Fast  
Associative  
Automatic pilot



## SYSTEM 2

Rational thinking



Takes effort  
Slow  
Logical  
Lazy  
Indecisive

# Uncomfortable Truth

People will tend to drive the speed they feel comfortable driving, regardless of any other factor.

**BE SAFE.  
DRIVE SMART.**

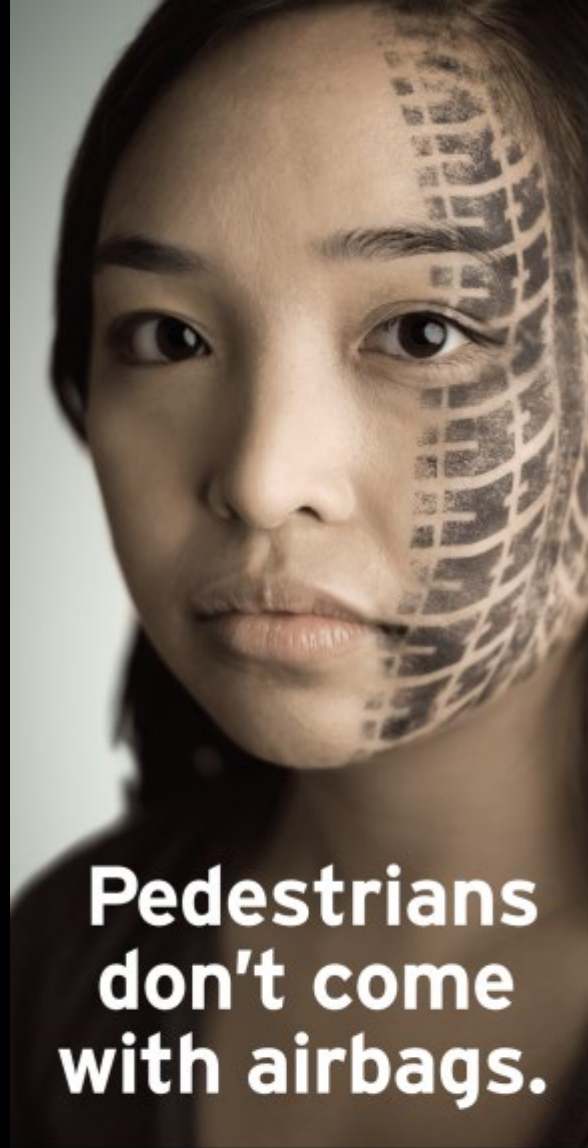




**Some  
mistakes you  
can't take back.**

Stop for pedestrians  
at crosswalks.

**BE SAFE. DRIVE SMART. **  
#EndTheStreakTX



**Pedestrians  
don't come  
with airbags.**

Yield the right of way  
to pedestrians.

**BE SAFE. DRIVE SMART. **  
#EndTheStreakTX

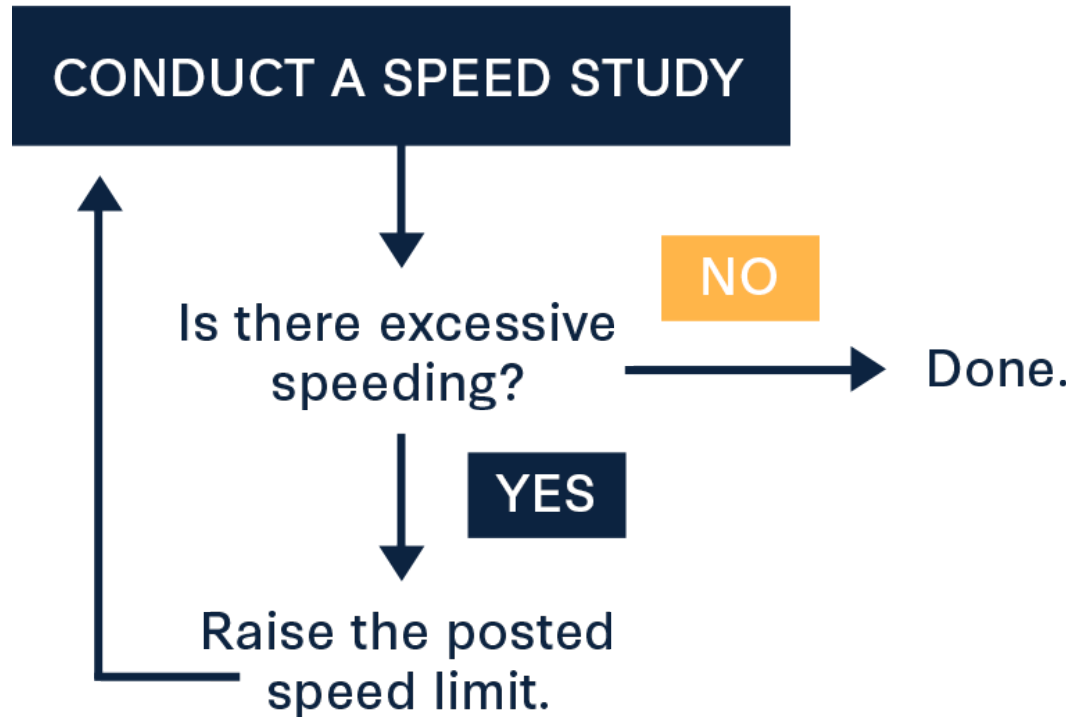


**You can't fix a  
pedestrian at  
a body shop.**

Slow down and  
watch for pedestrians.

**BE SAFE. DRIVE SMART. **  
#EndTheStreakTX

# Standard Engineering Approach



**If you need a sign to tell people to slow down...**

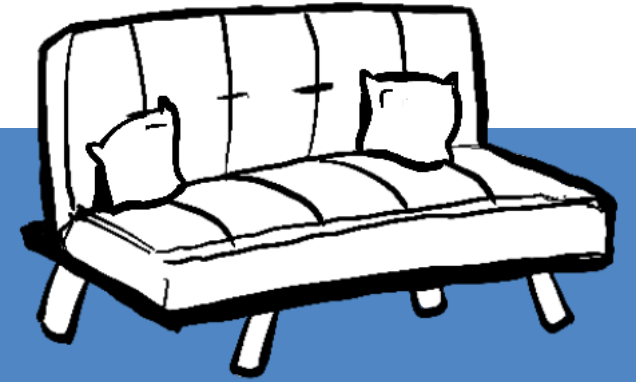
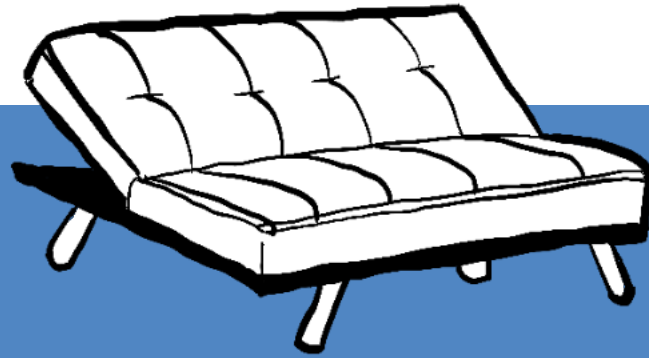
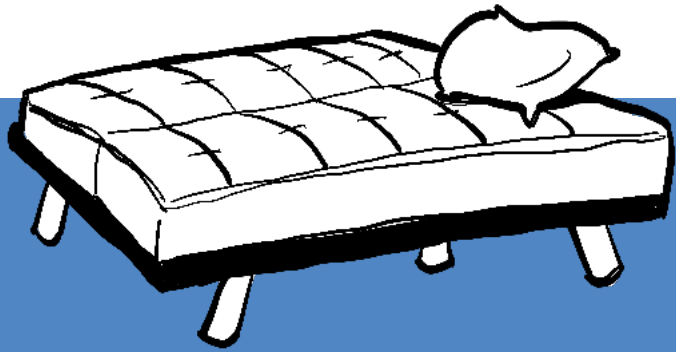


**...you designed your street wrong.**

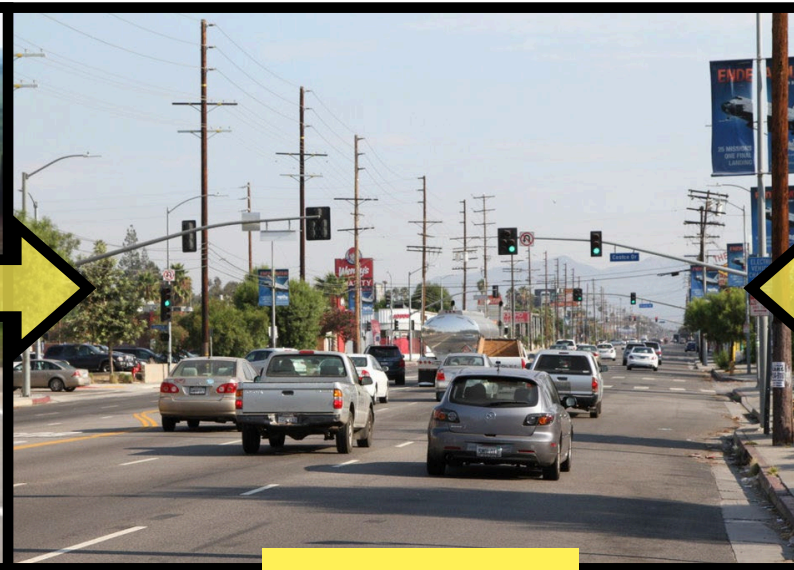
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Question:

**Can we talk about Stroads?**



ROAD



STROAD



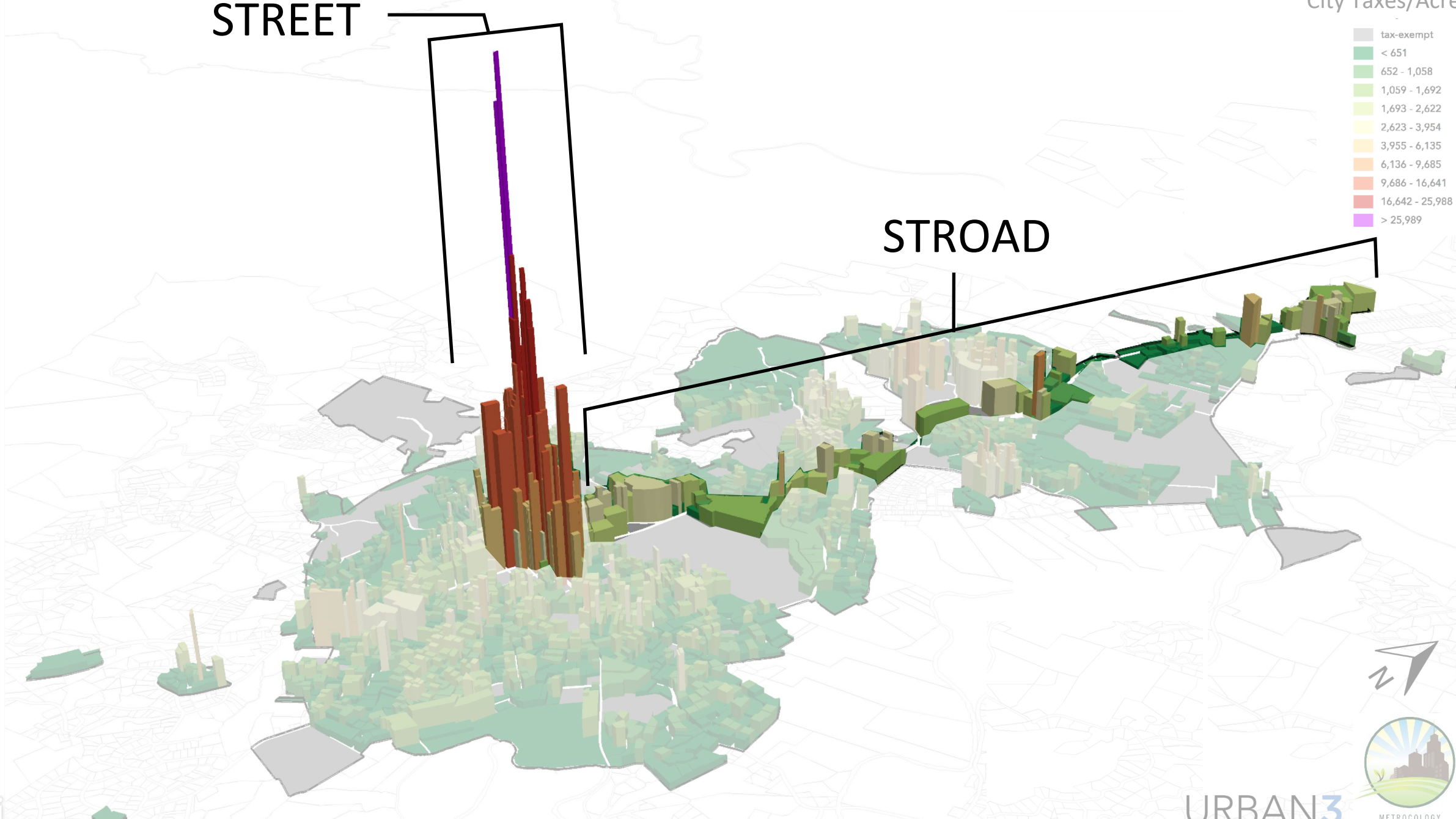
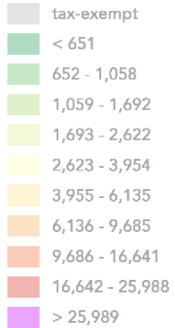
STREET



STREET

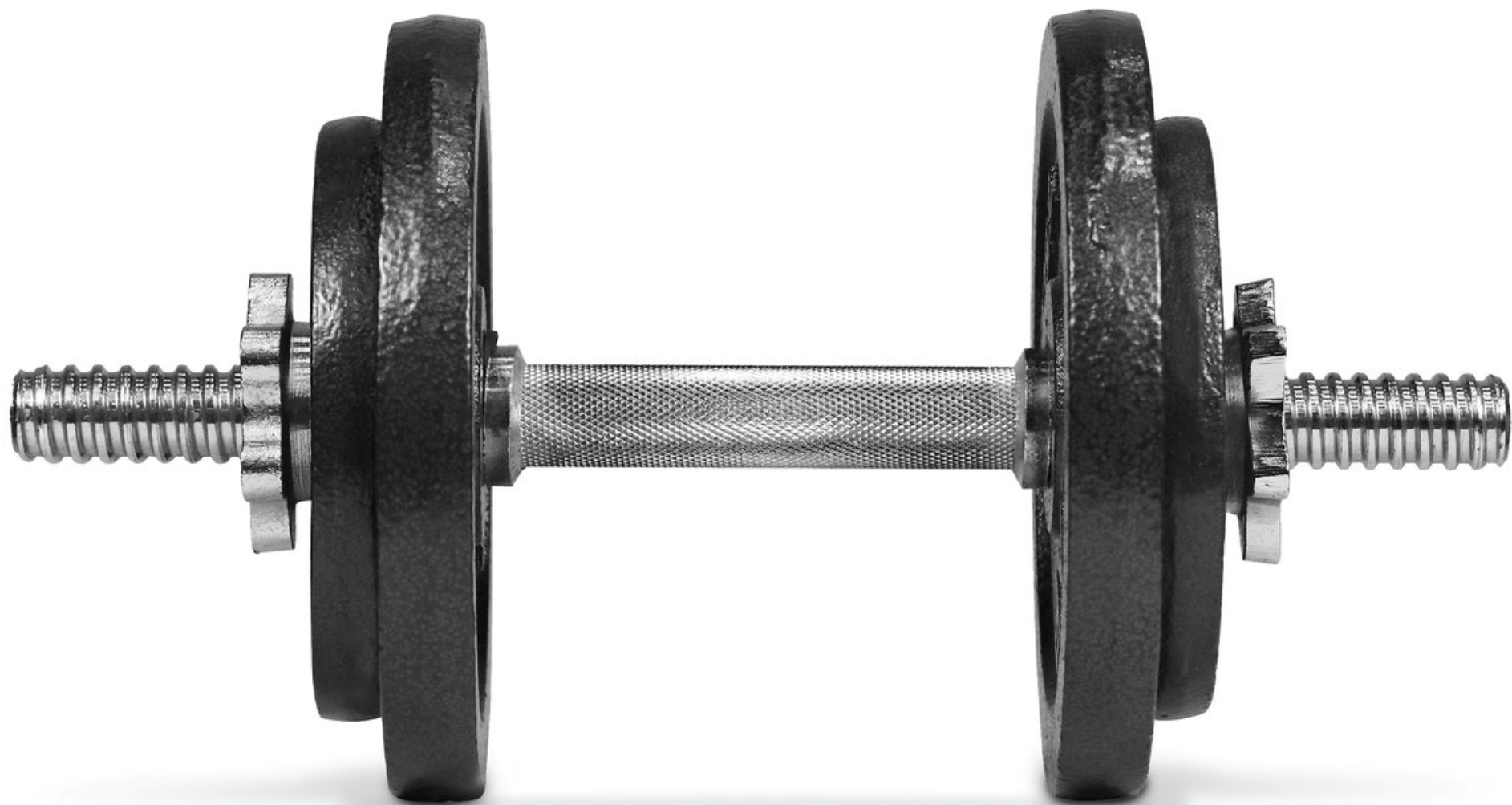
STROAD

City Taxes/Acre



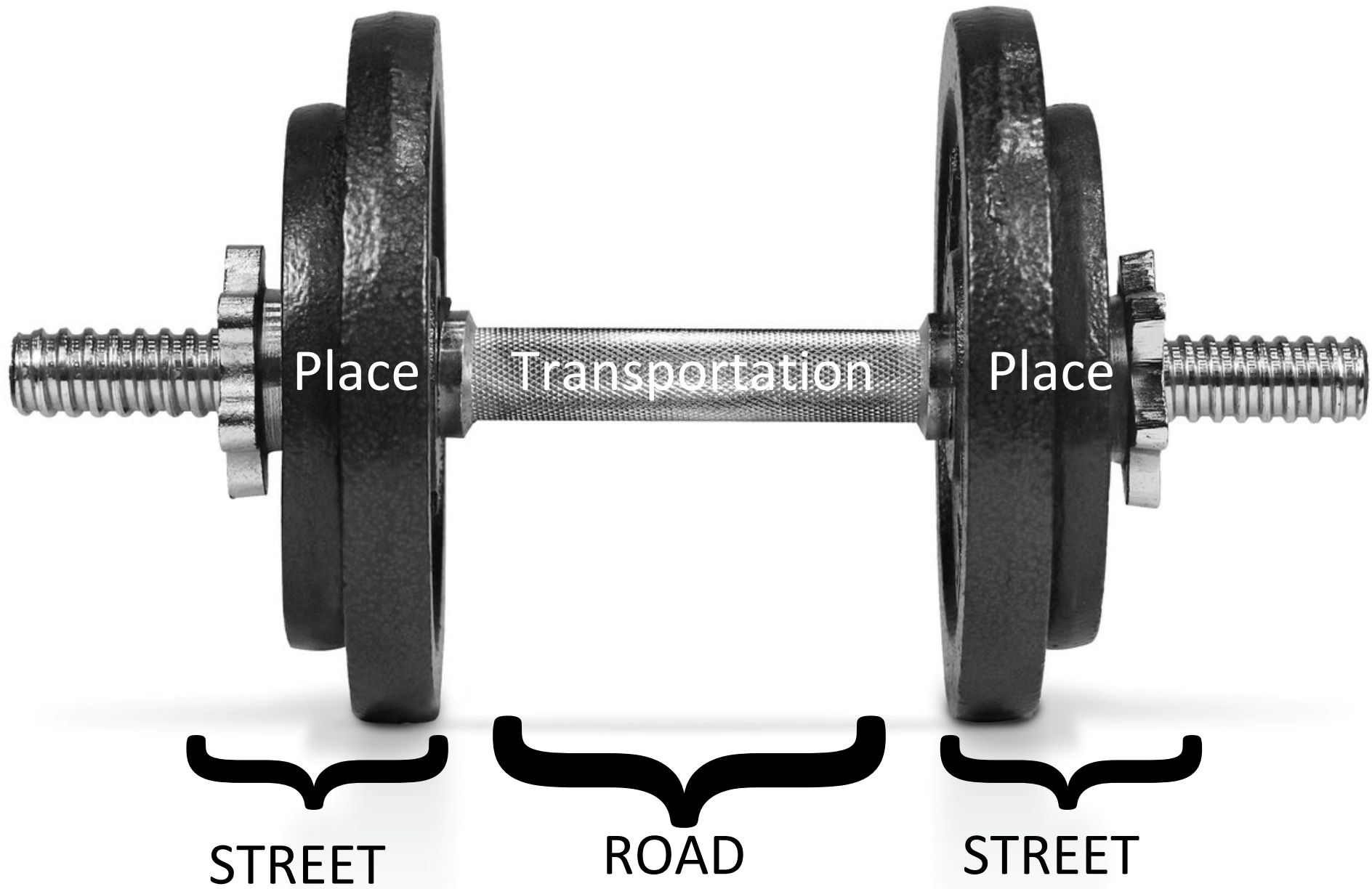
URBAN3

METROCOLOGY



URBAN3





# Too many needs....

**REPAIRS**



**CONGESTION**



**SAFETY**



**GROWTH**



....and not enough money.

Too many demands....



....and not enough money.

Too many additional things to do....



....and not enough money.



**We need more money.**

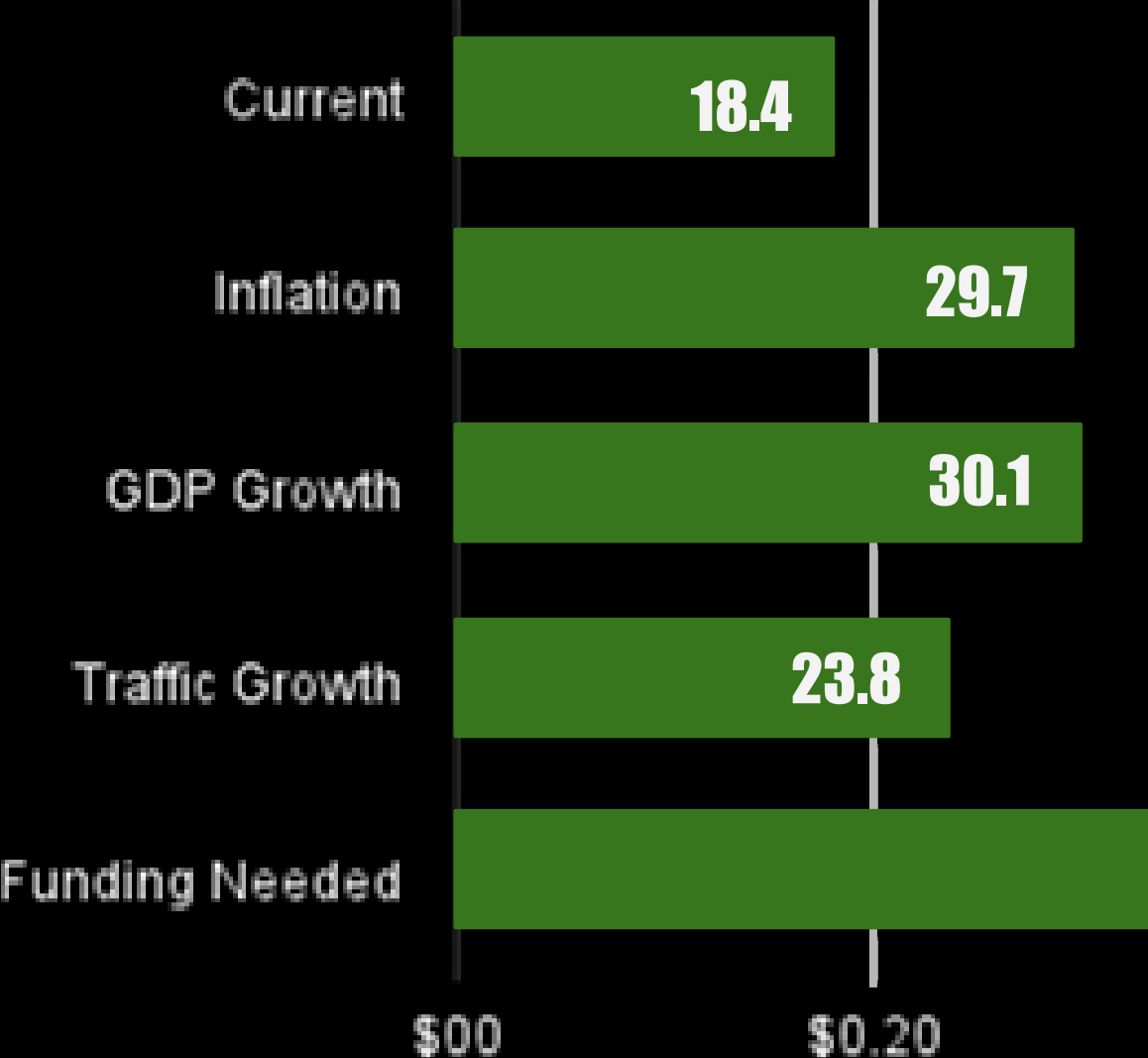


# Transportation Funding Gap

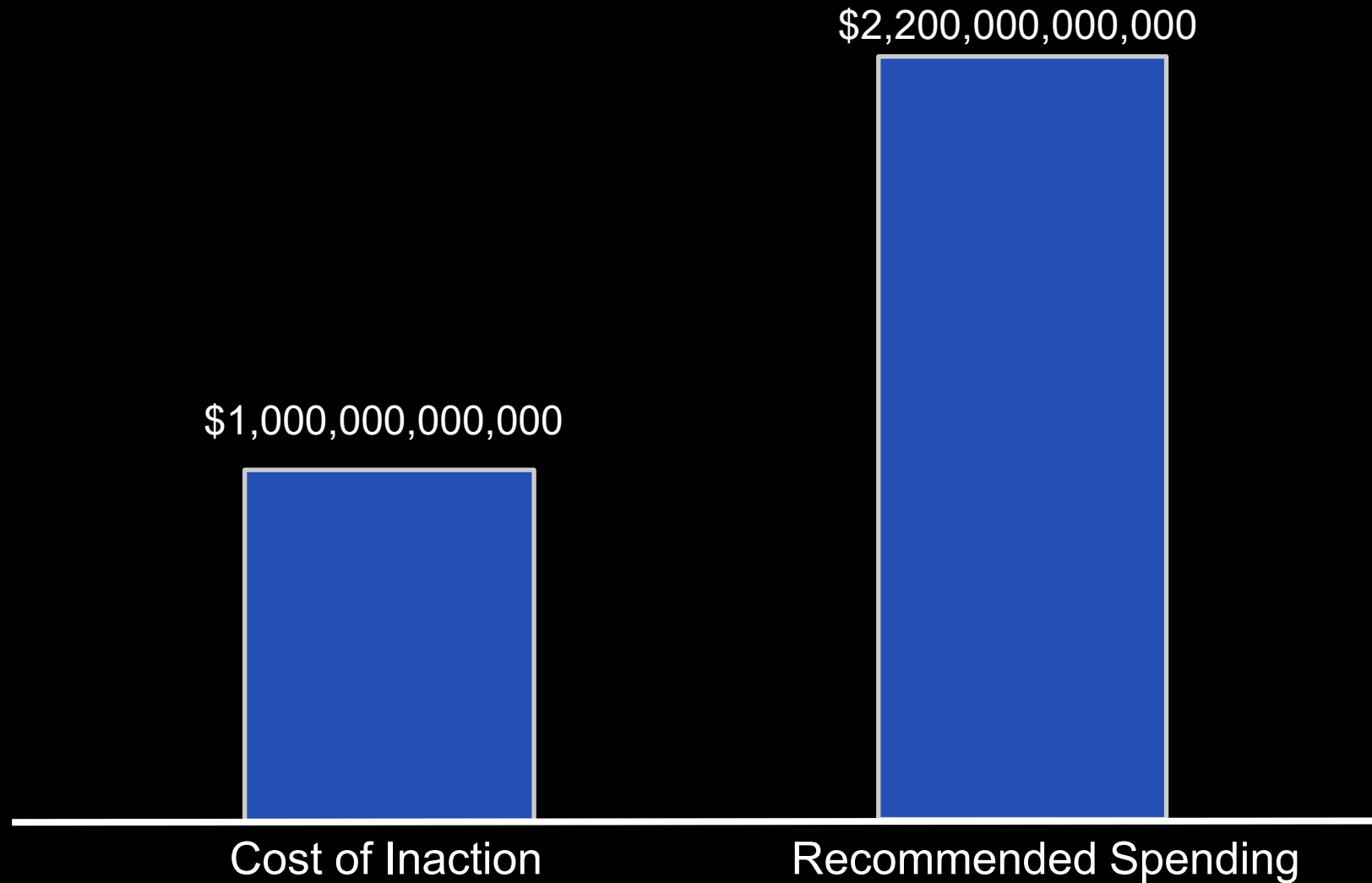
**\$94 Billion/Year**



# Federal Gas Tax

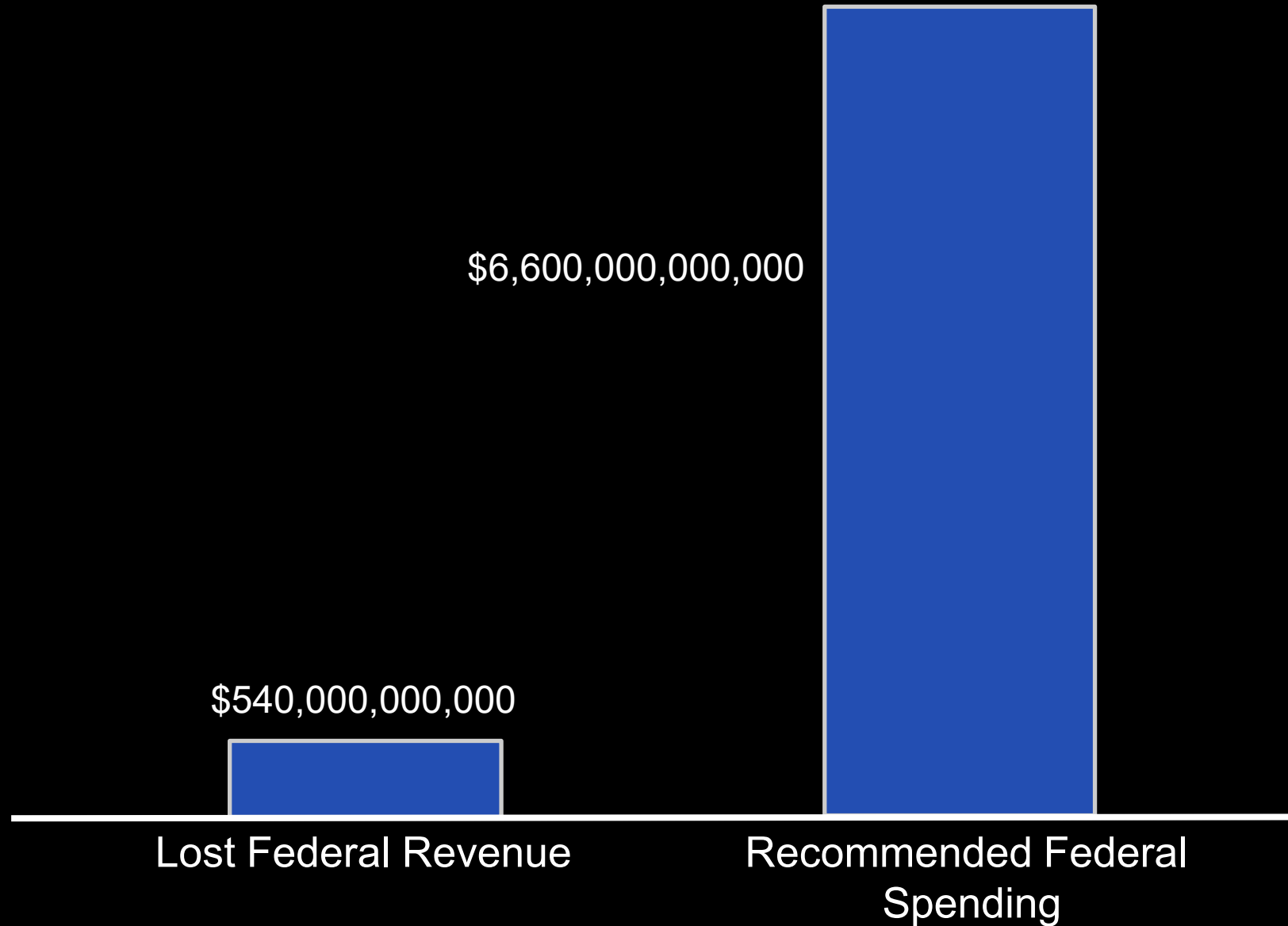


# ASCE Estimates, Ten Year

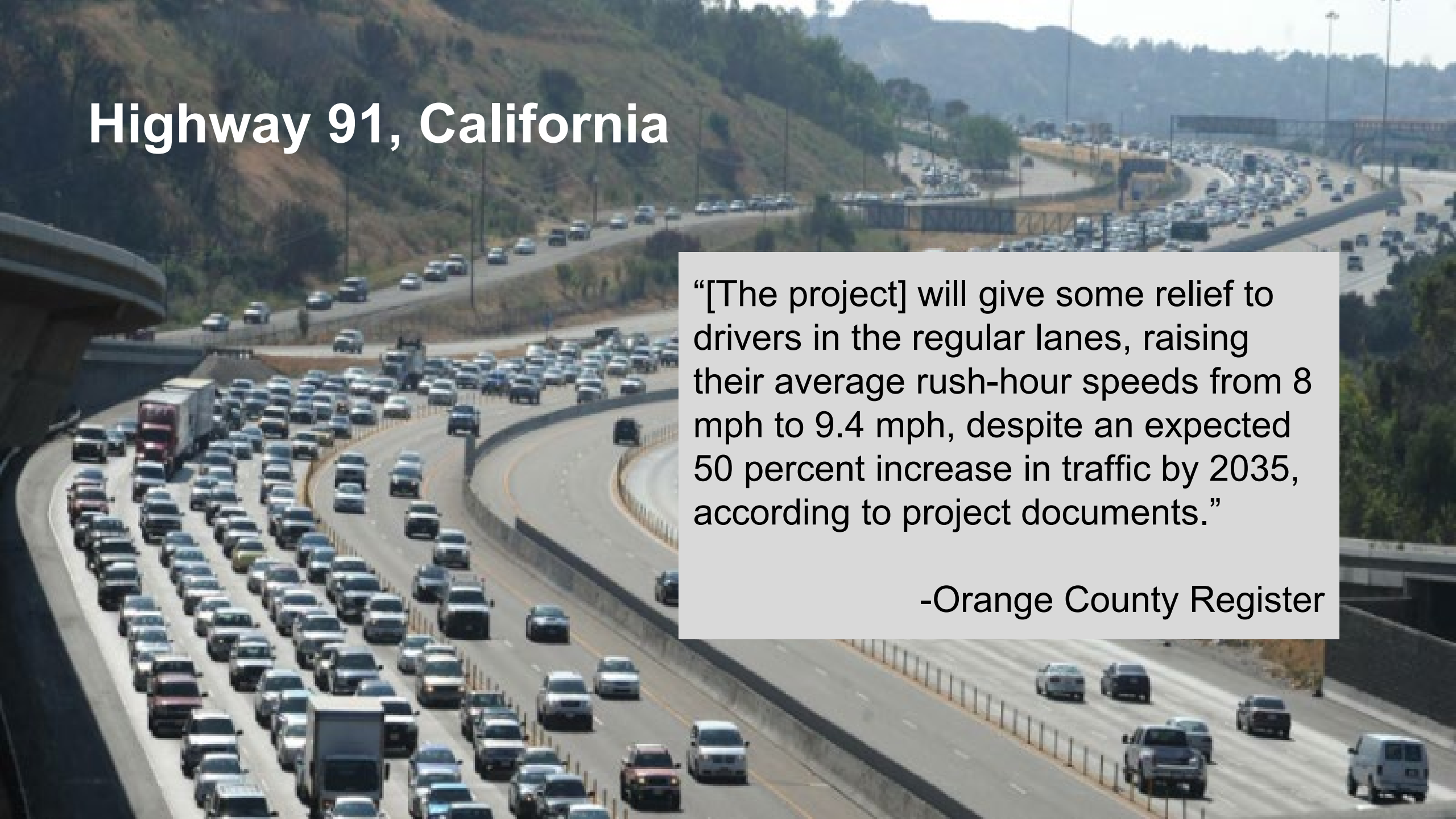




# ASCE Estimates, Thirty Year



# Highway 91, California

An aerial photograph of a multi-lane highway, likely Highway 91 in California, showing heavy traffic. The highway curves through a hilly, semi-arid landscape. The traffic is dense, with many cars and several large trucks. The road is flanked by concrete barriers and has multiple lanes in each direction. In the background, there are more hills and some infrastructure like overpasses.

“[The project] will give some relief to drivers in the regular lanes, raising their average rush-hour speeds from 8 mph to 9.4 mph, despite an expected 50 percent increase in traffic by 2035, according to project documents.”

-Orange County Register



**We need more money.**



A photograph of the White House in Washington, D.C., taken at night. The building is illuminated from within, casting a warm glow on its facade. The sky is a deep, dark blue. An American flag flies on a tall pole in front of the building. The foreground is a dark, grassy lawn.

# American Jobs Plan

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....a historic public investment in our nation's  
productivity and long-term growth.

“One in five miles, or 173,000 total miles, of our highways and major roads are in poor condition, as well as 45,000 bridges.”

- American Jobs Plan



# American Jobs Plan



“The President’s plan will modernize 20,000 miles of highways, roads, and main-streets.”

“It will fix the ten most economically significant bridges in the country in need of reconstruction. It also will repair the worst 10,000 smaller bridges....”

Miles of Road in Poor Condition



Miles of Road to Modernize

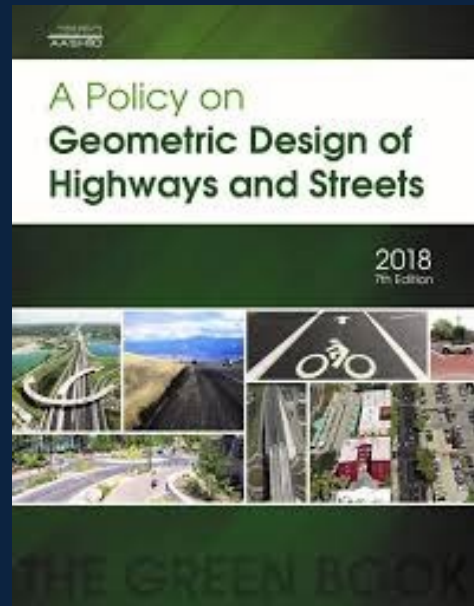
Bridges in Poor Condition

Bridges Repaired

(

If we don't have the money,  
what then?



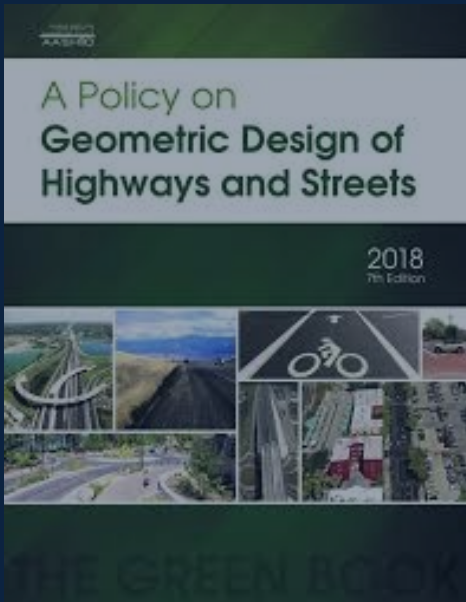




SPEED



VOLUME



A Policy on  
Geometric Design of  
Highways and Streets

2018  
7th Edition

SAFETY



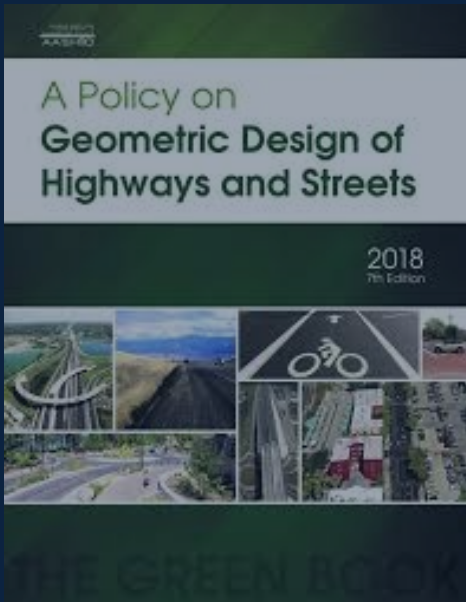
COST



SPEED



VOLUME



SAFETY



COST

# Engineer's Priorities

SPEED

VOLUME

SAFETY

COST





**Engineer**

**Society**

SPEED

VOLUME

SAFETY

COST

# Engineer

SPEED

VOLUME

SAFETY

COST

# Society

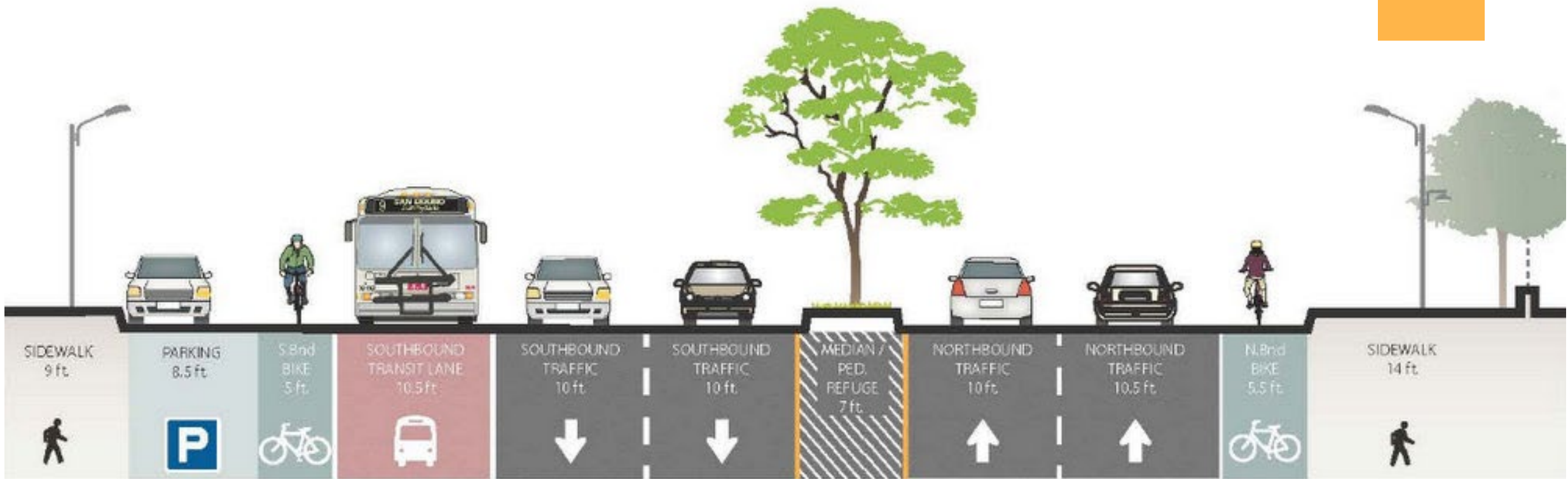
SAFETY

COST

VOLUME

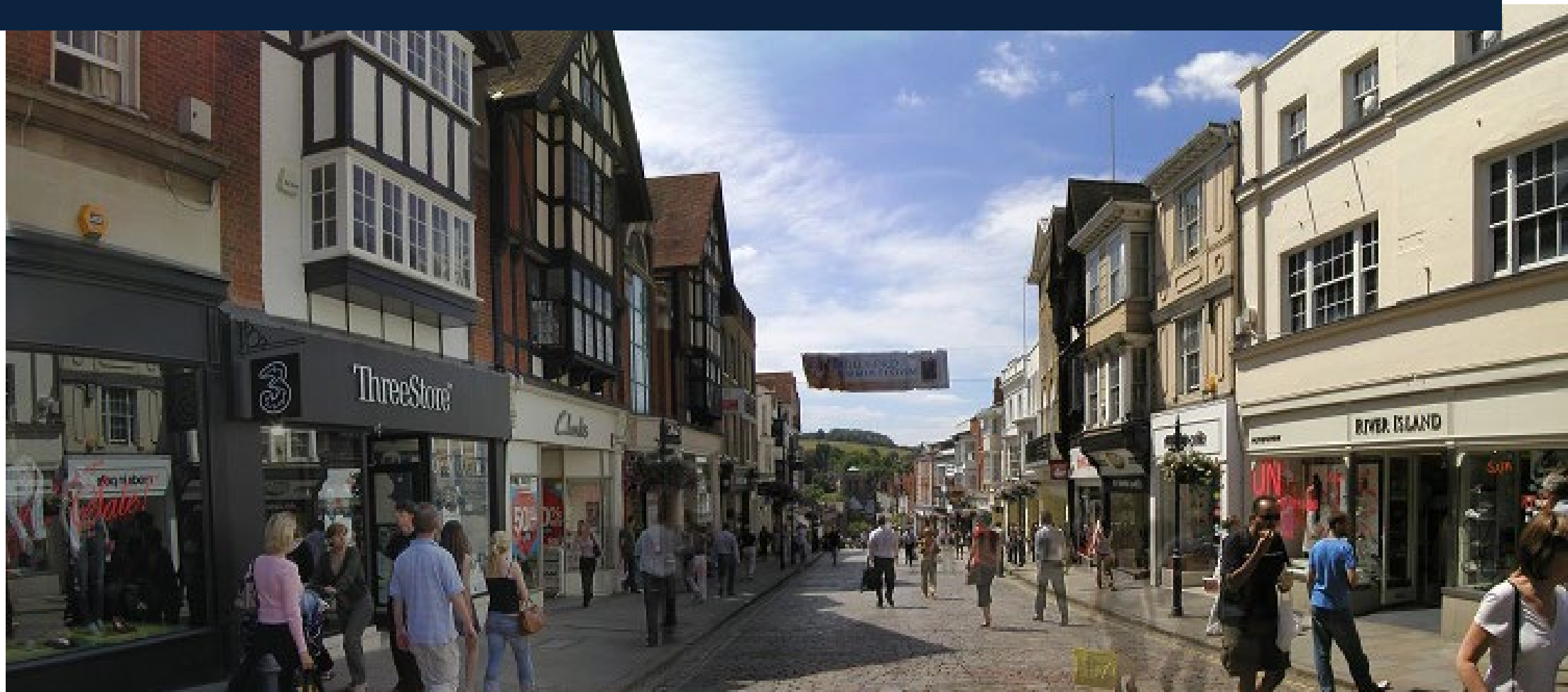
SPEED

# Complete Streets accommodate pedestrians within an auto-dominated environment.

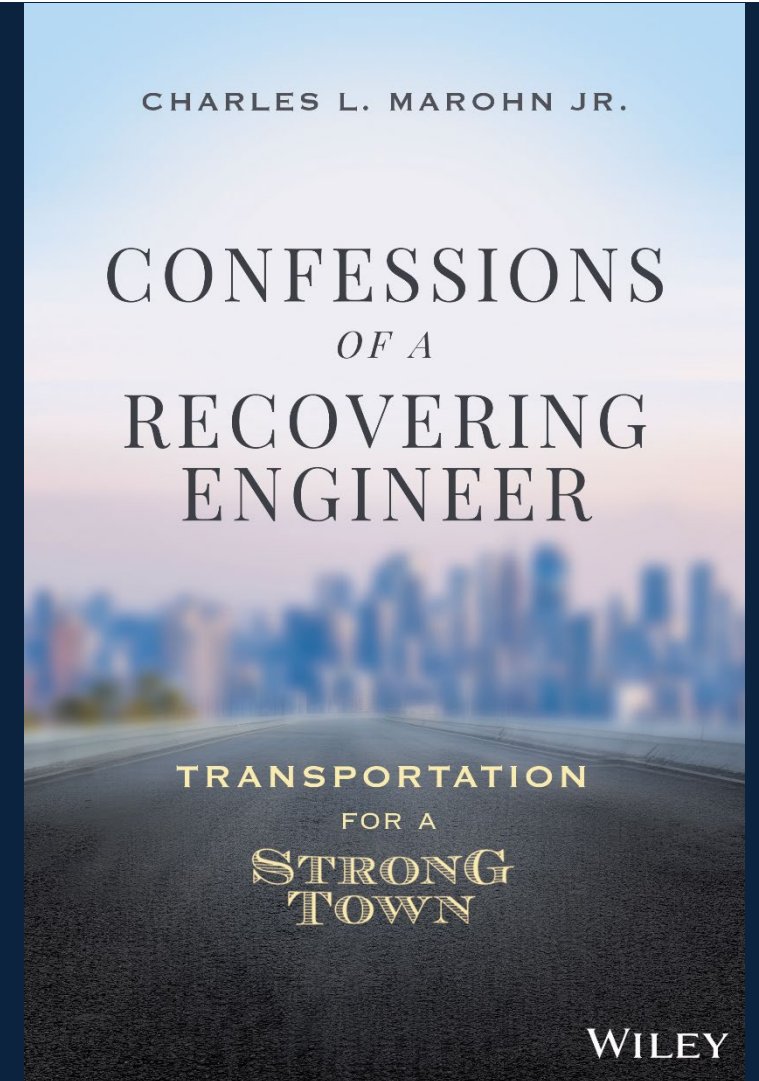
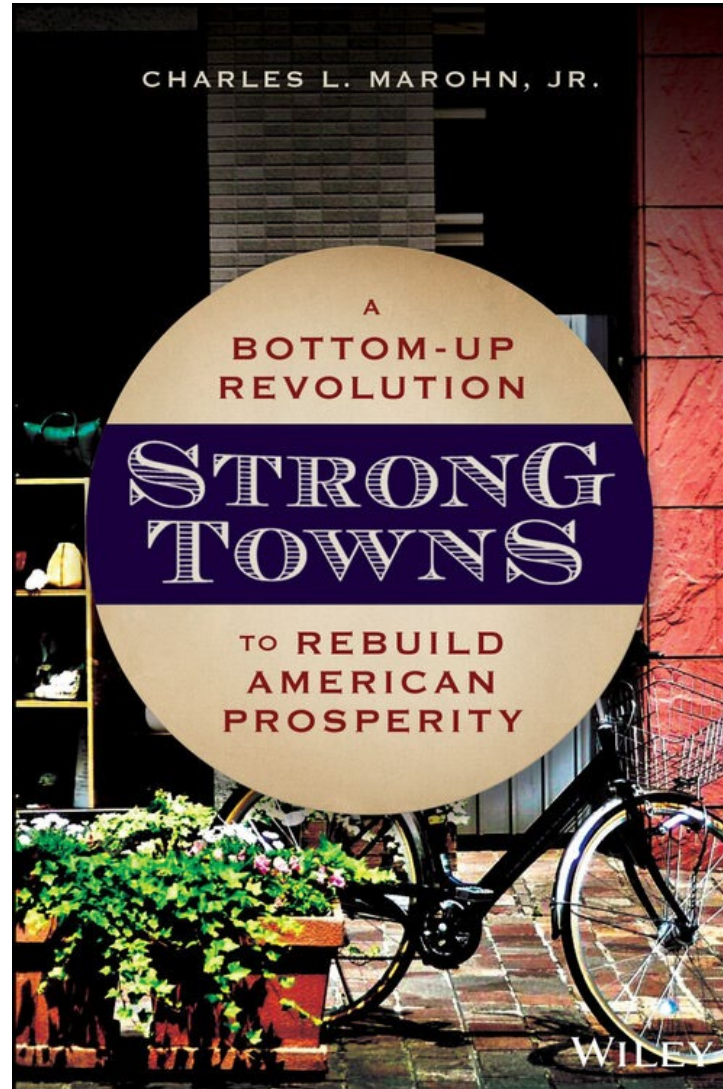




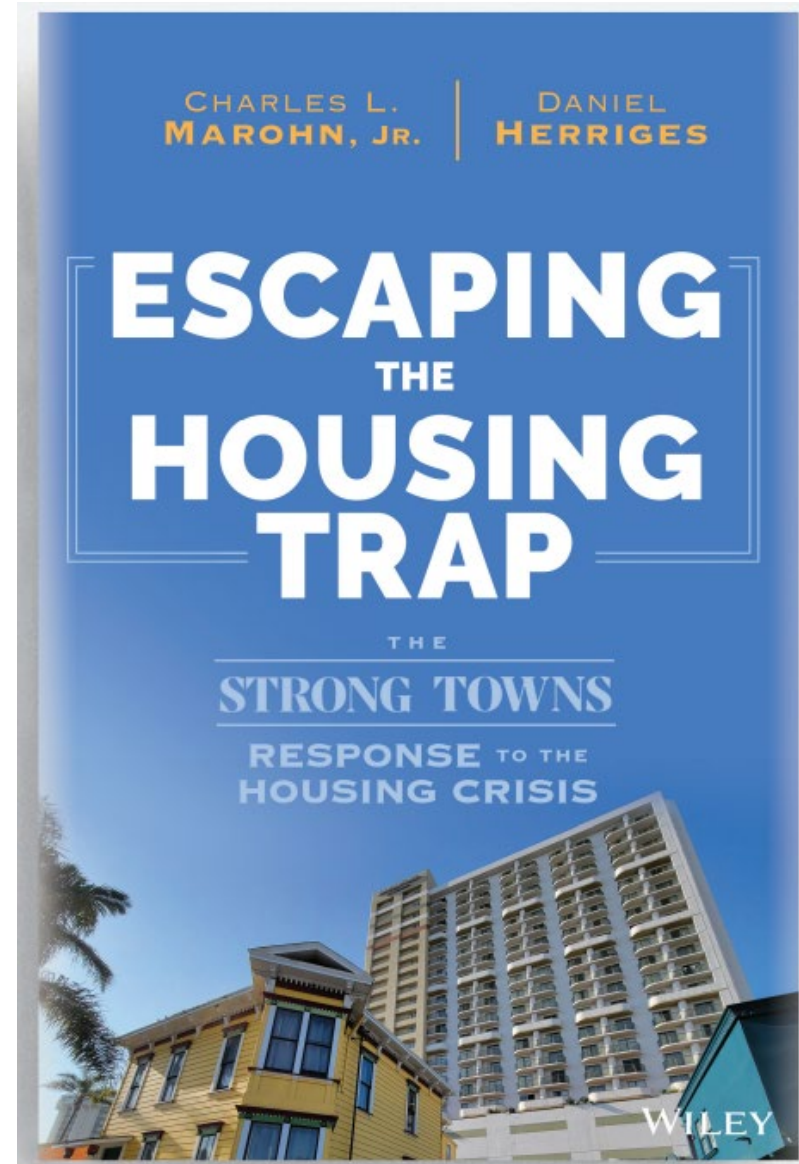
**Strong Towns accommodate automobiles within an environment dominated by people.**



# More on the Strong Towns Approach



Coming  
March 2024





[www.strongtowns.org](http://www.strongtowns.org)



A BOTTOM-UP REVOLUTION TO REBUILD  
AMERICAN PROSPERITY