Ten Easy Directions for Sustainable Transportation

April 2013

Jeffrey Tumlin

NELSON
NYGAARD

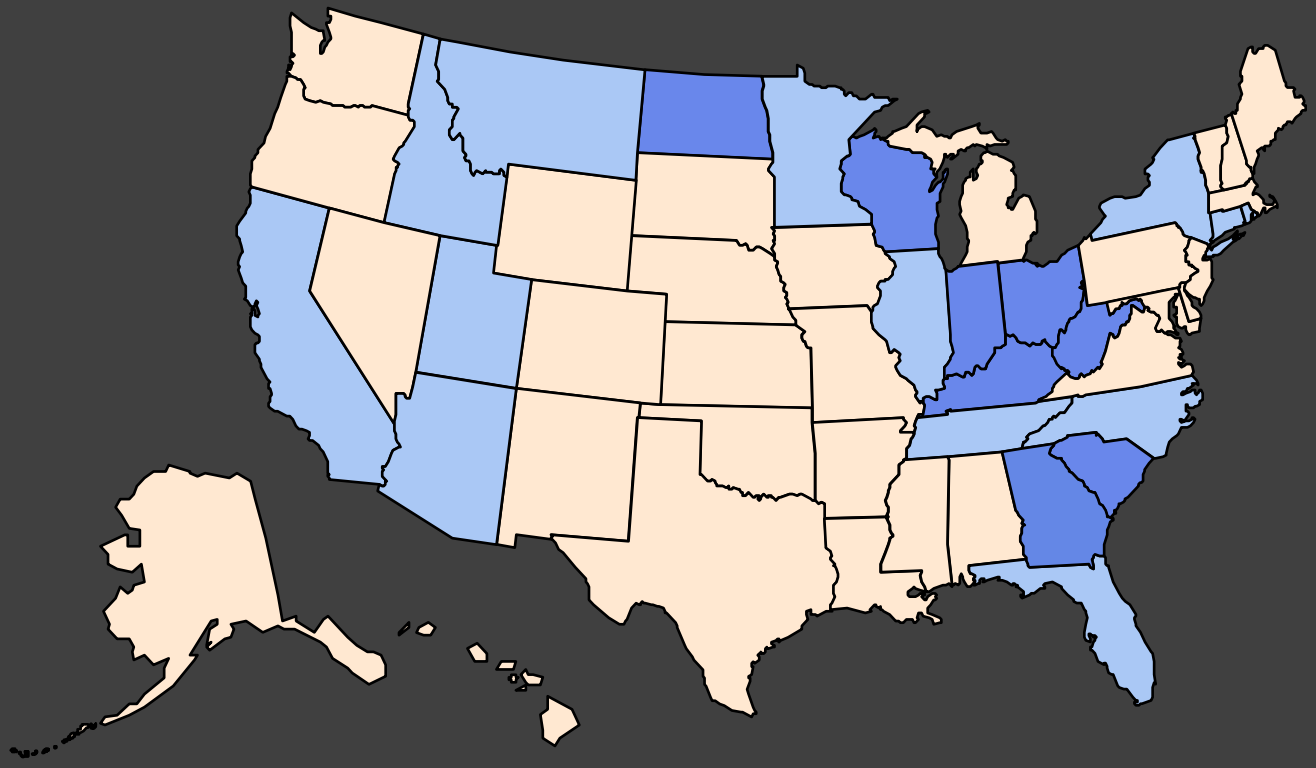
Presentation Outline

- **What's wrong with this picture?**
- **Do try this at home:**

1. Measure what matters
2. Make walking a pleasure
3. Put the needs of daily life within walking distance
4. Make biking safe and easy for everyone
5. Make transit fast, frequent, reliable, dignified
6. Adopt good street design manuals
7. Make traffic analysis work
8. Price it Right
9. Manage & price parking
10. Create a better vision

Obesity Trends* Among U.S. Adults
BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs. overweight for 5’ 4” person)



All slides, Centers for Disease Control

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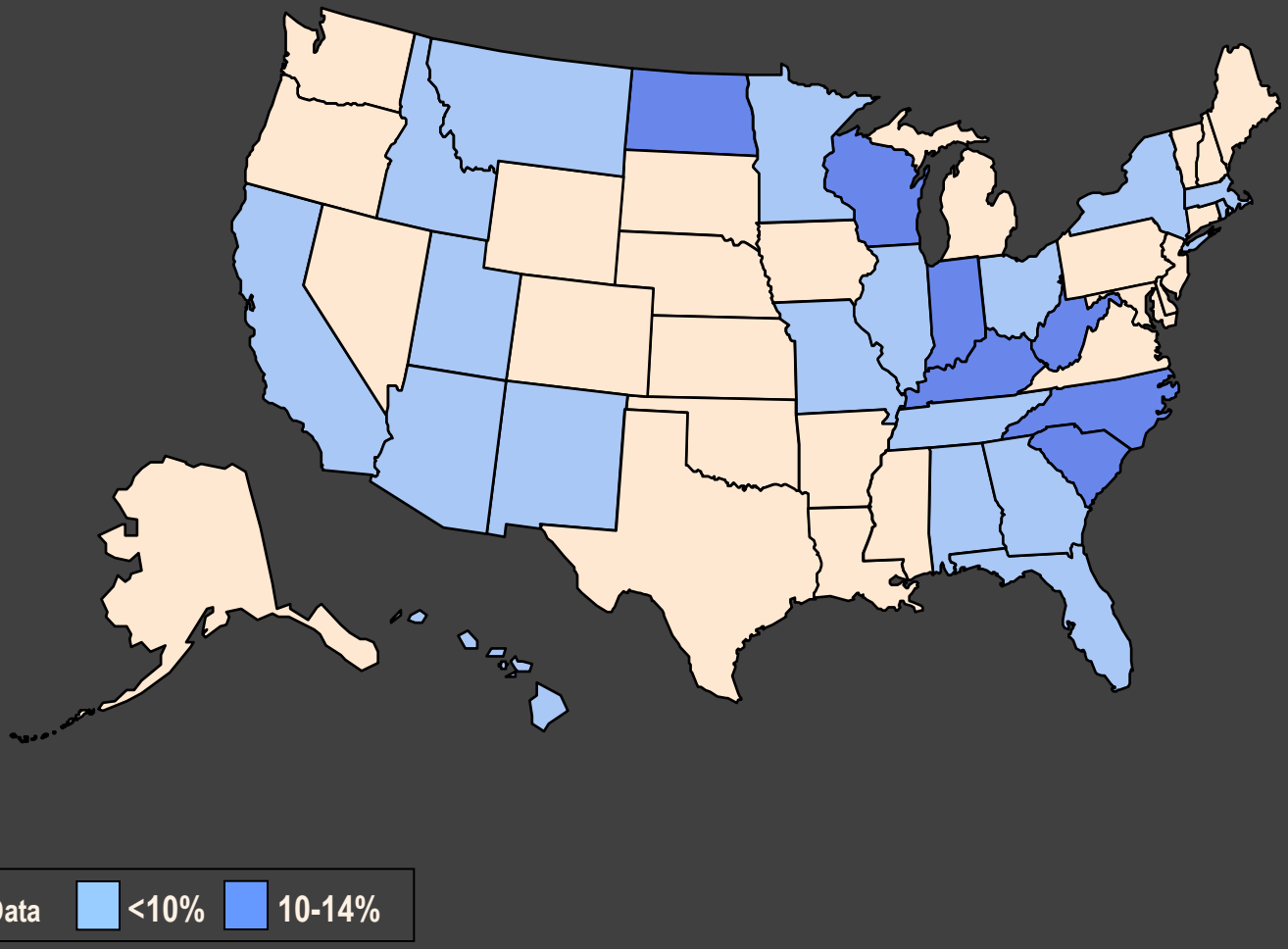

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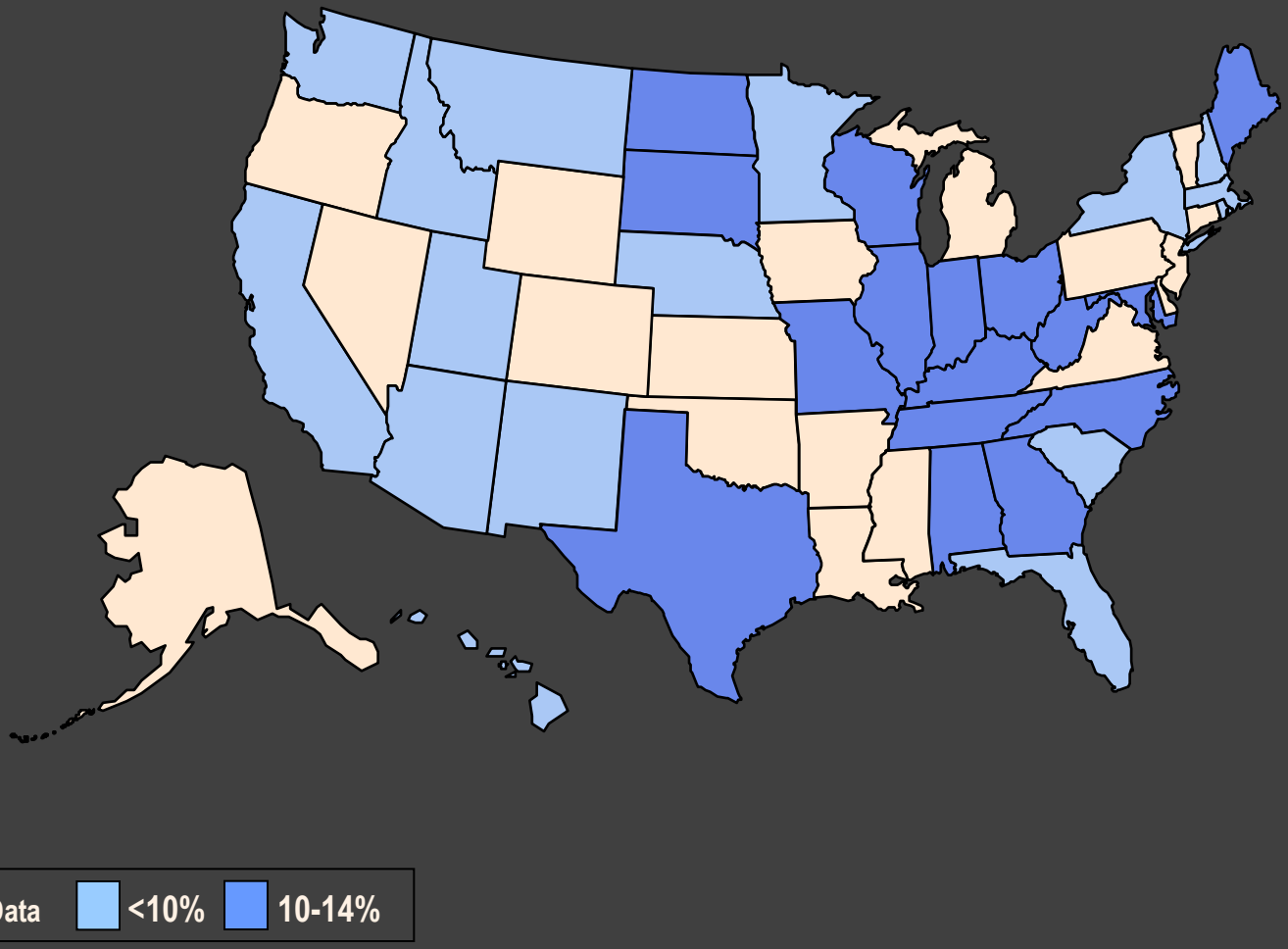

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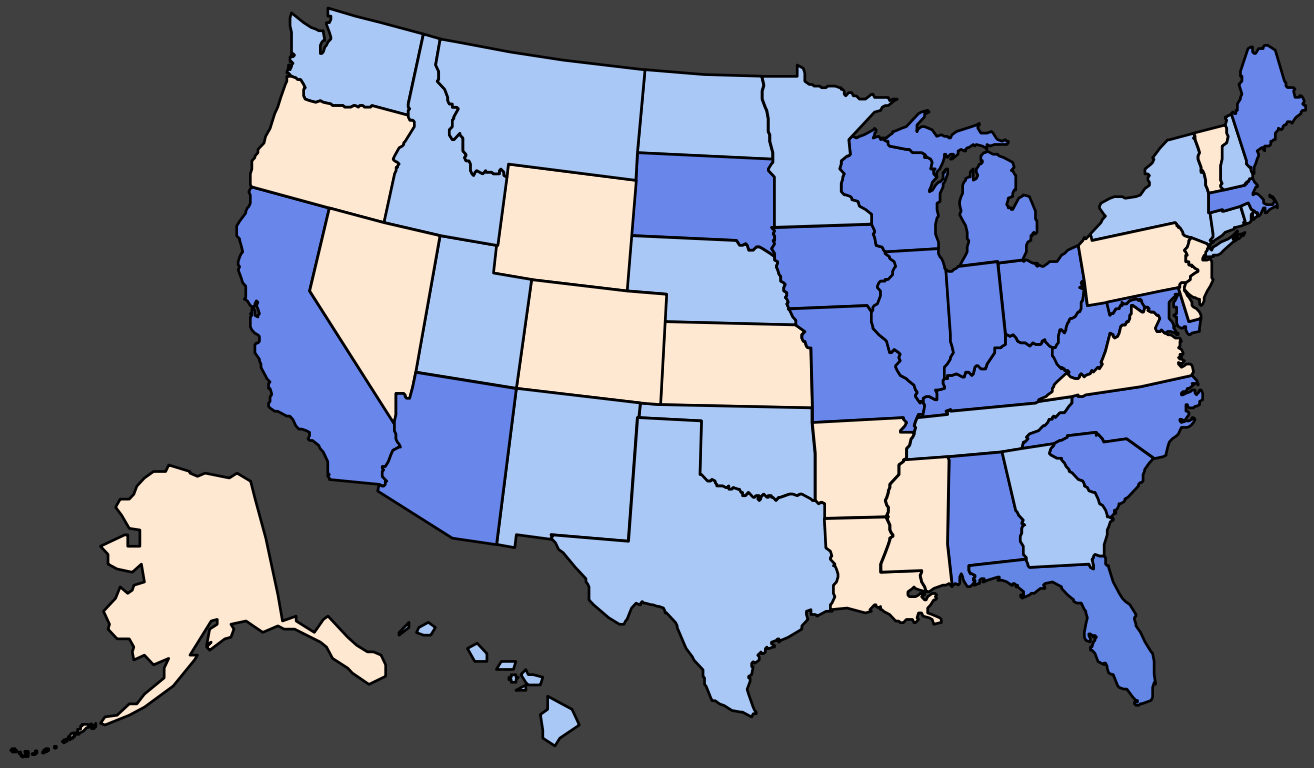

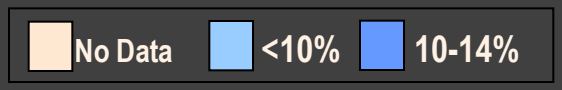

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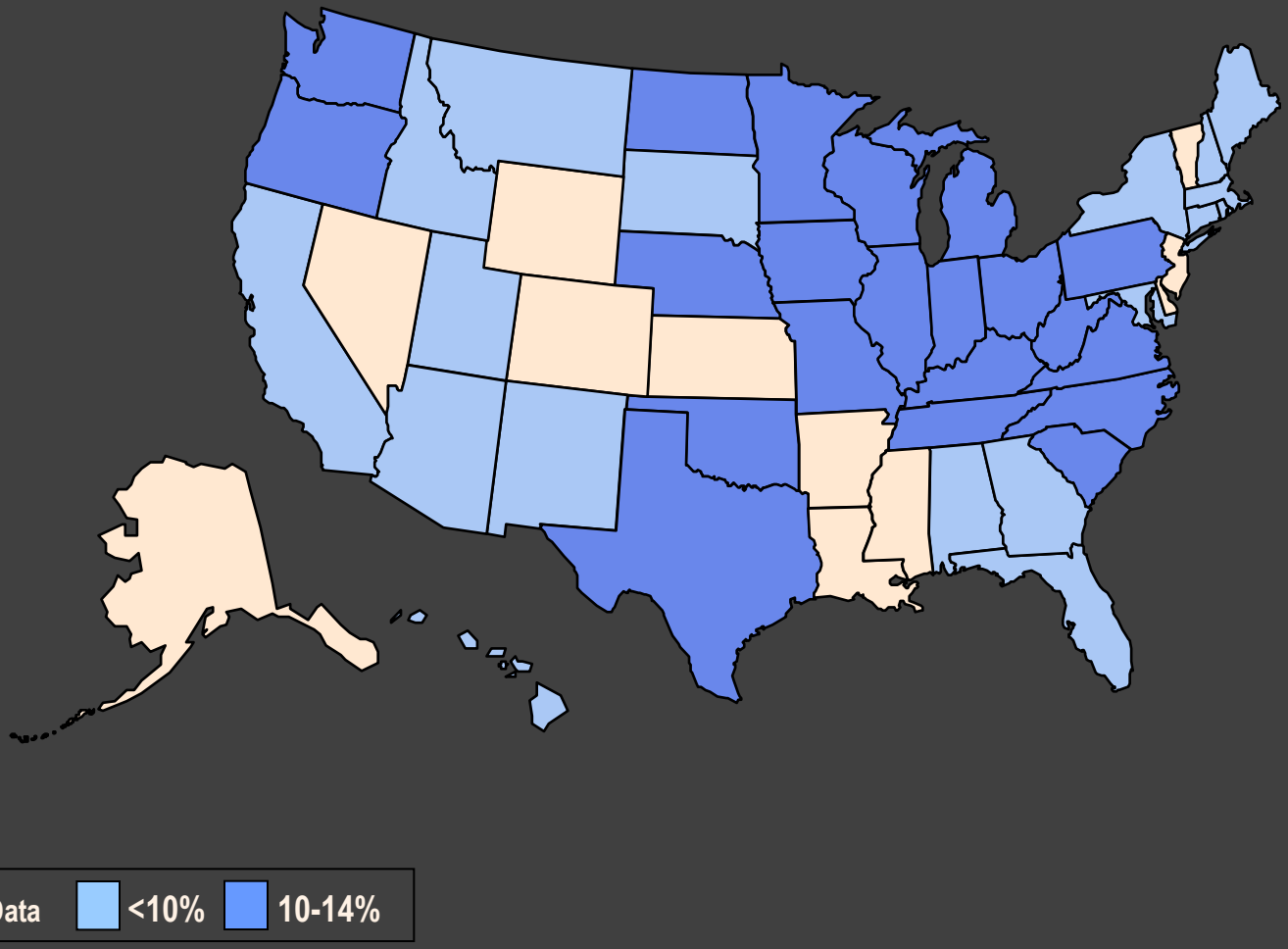

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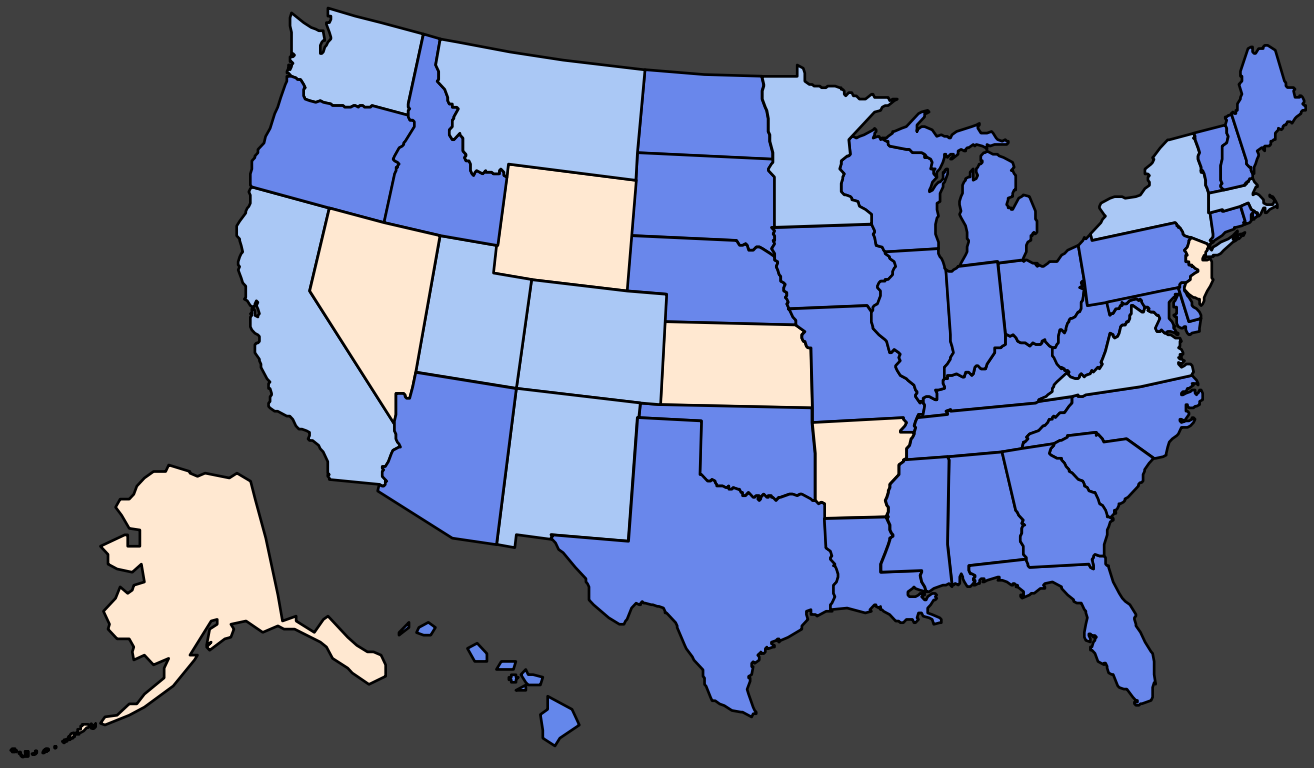

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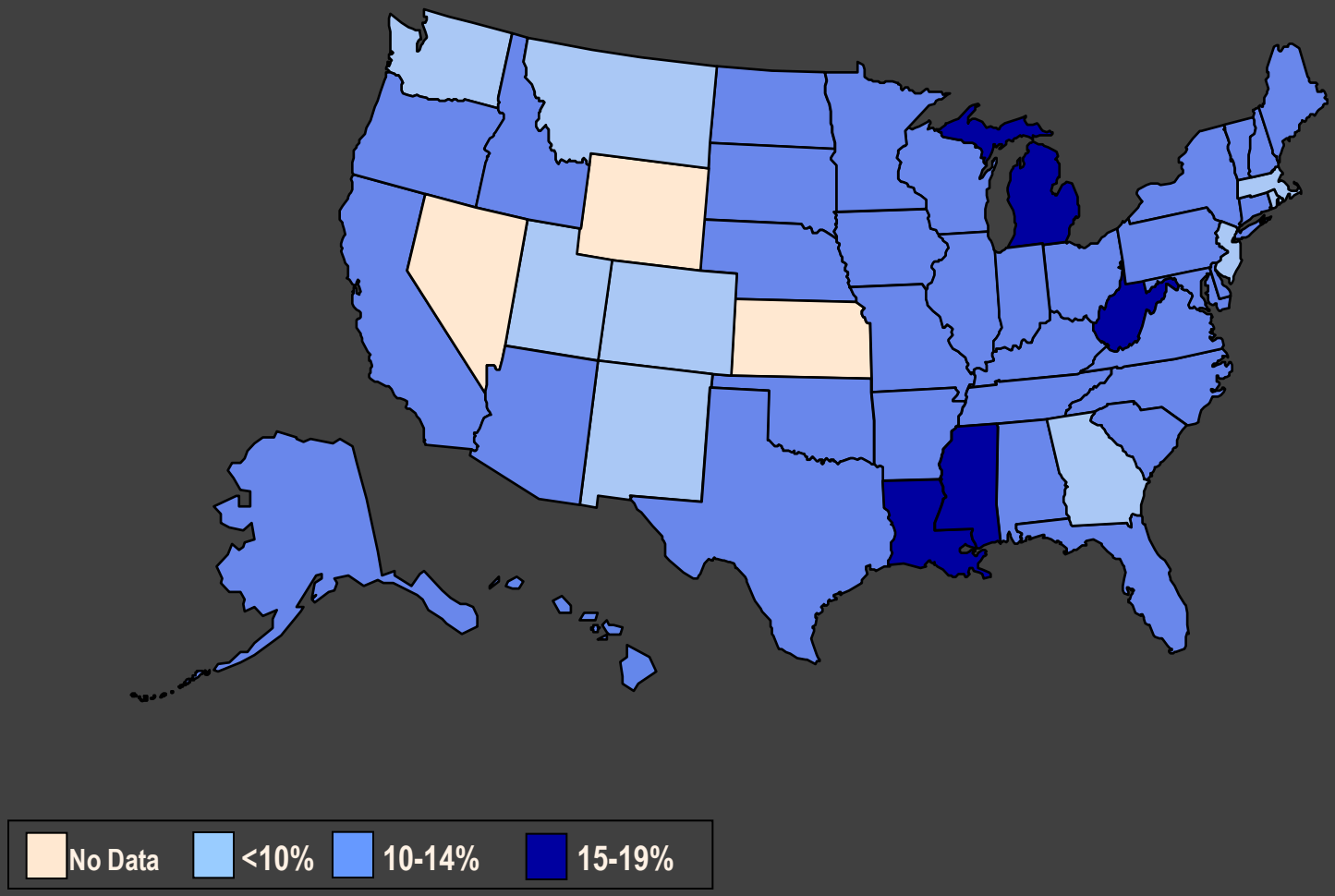

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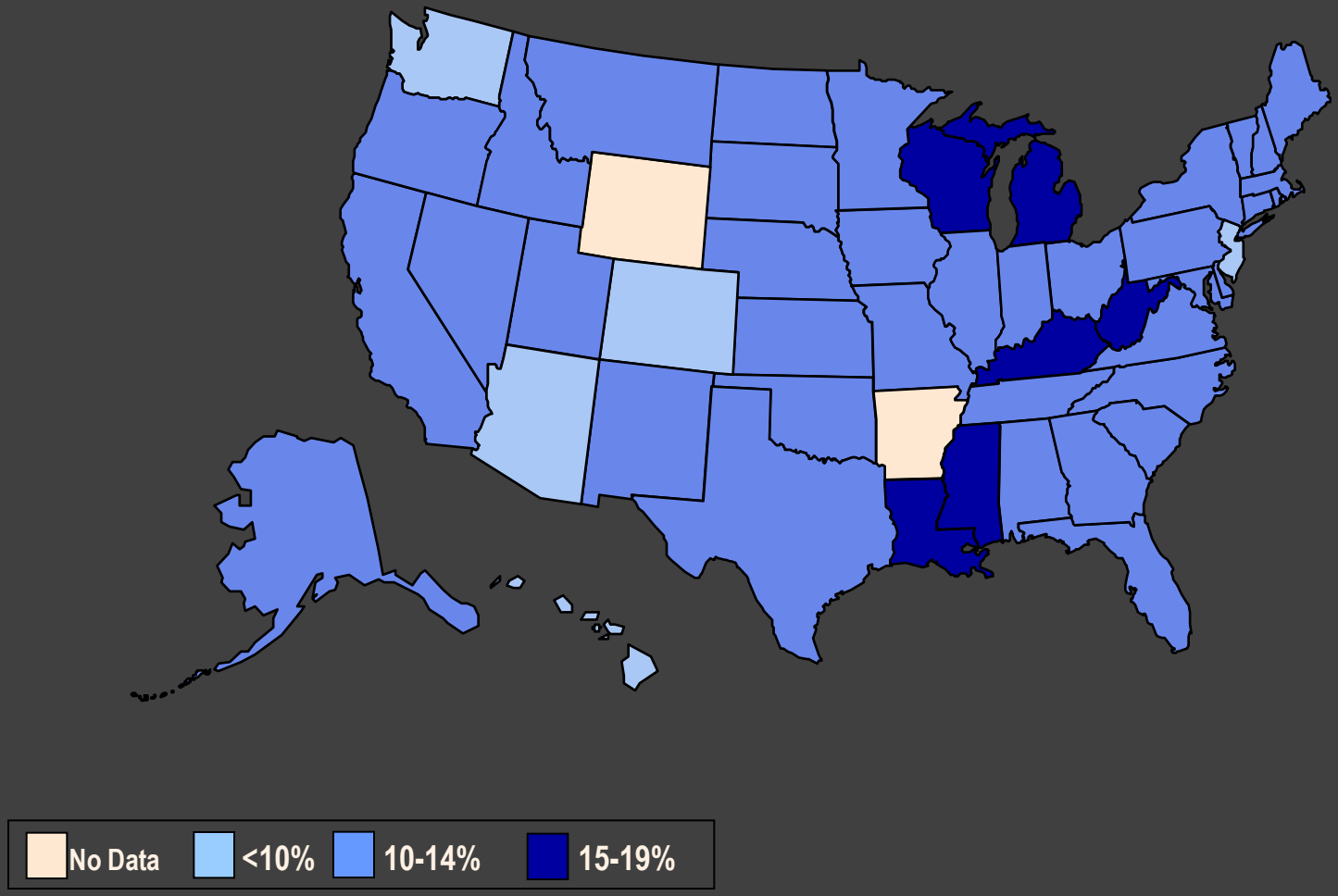

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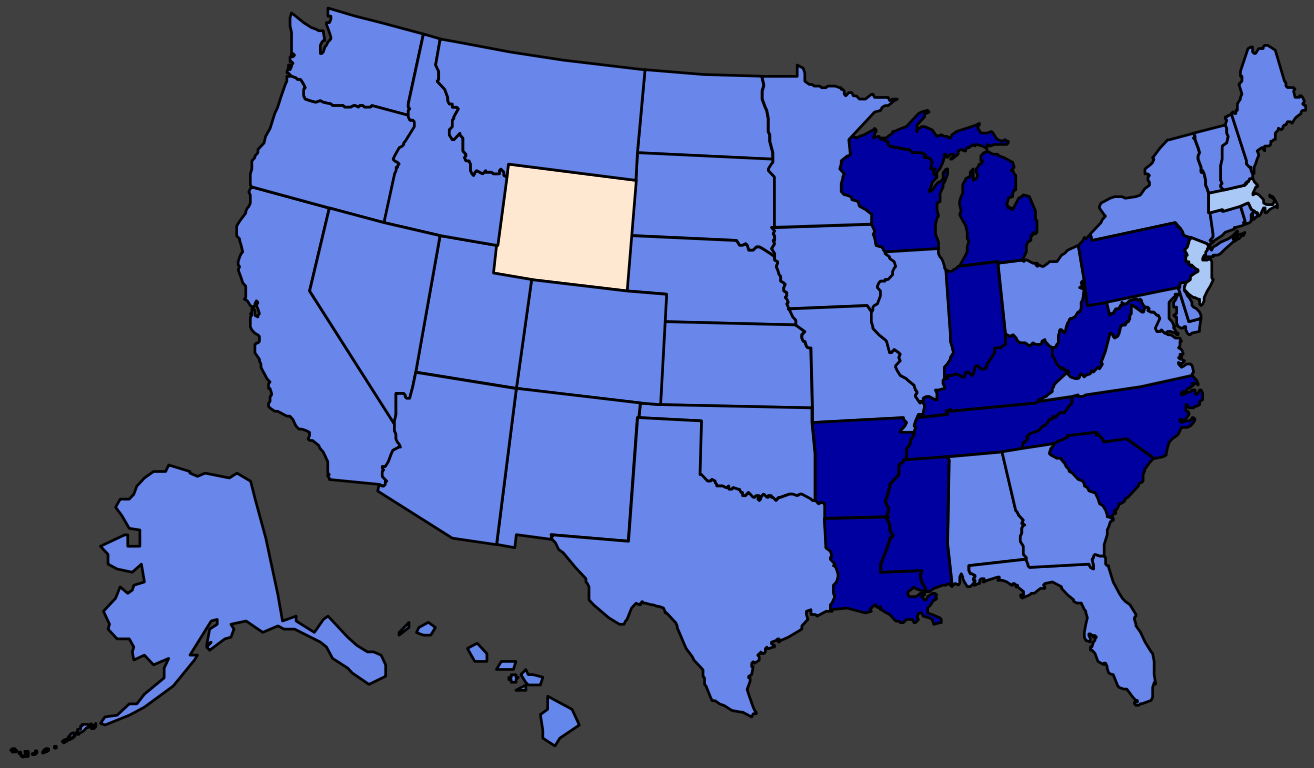

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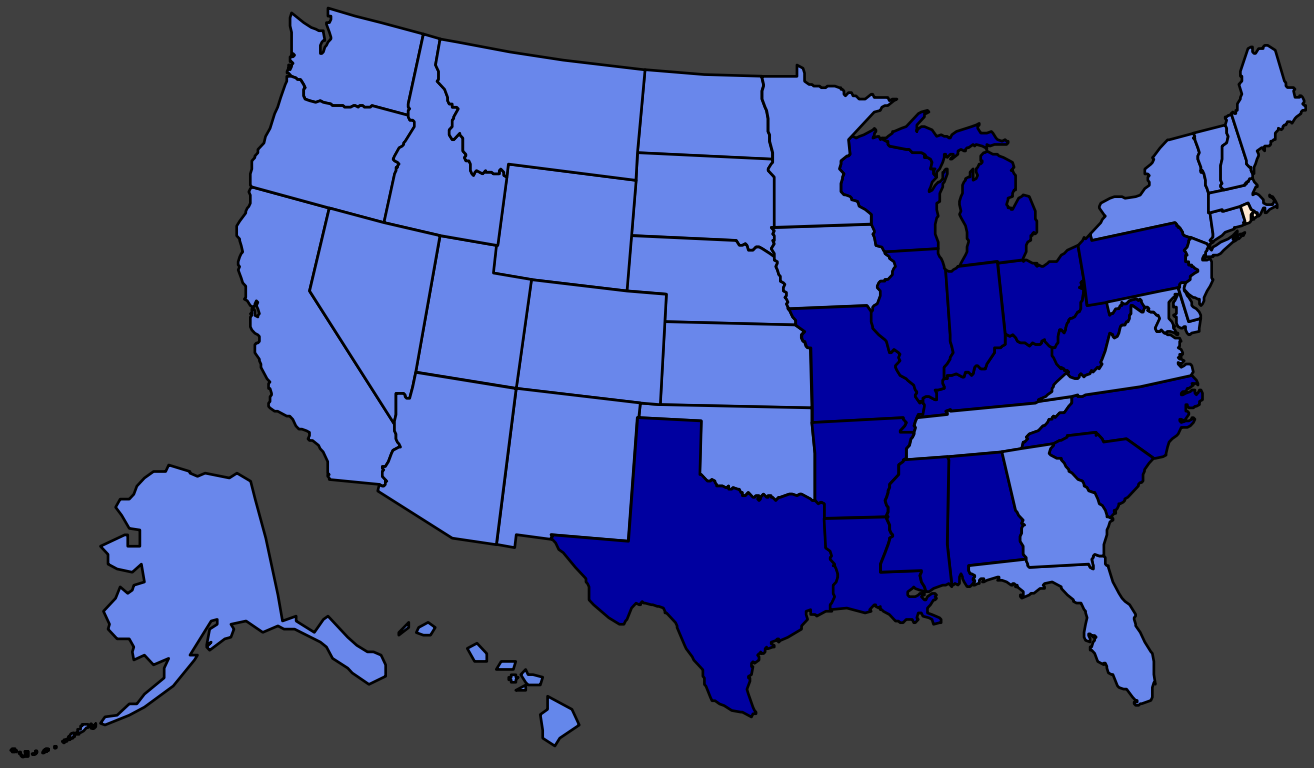

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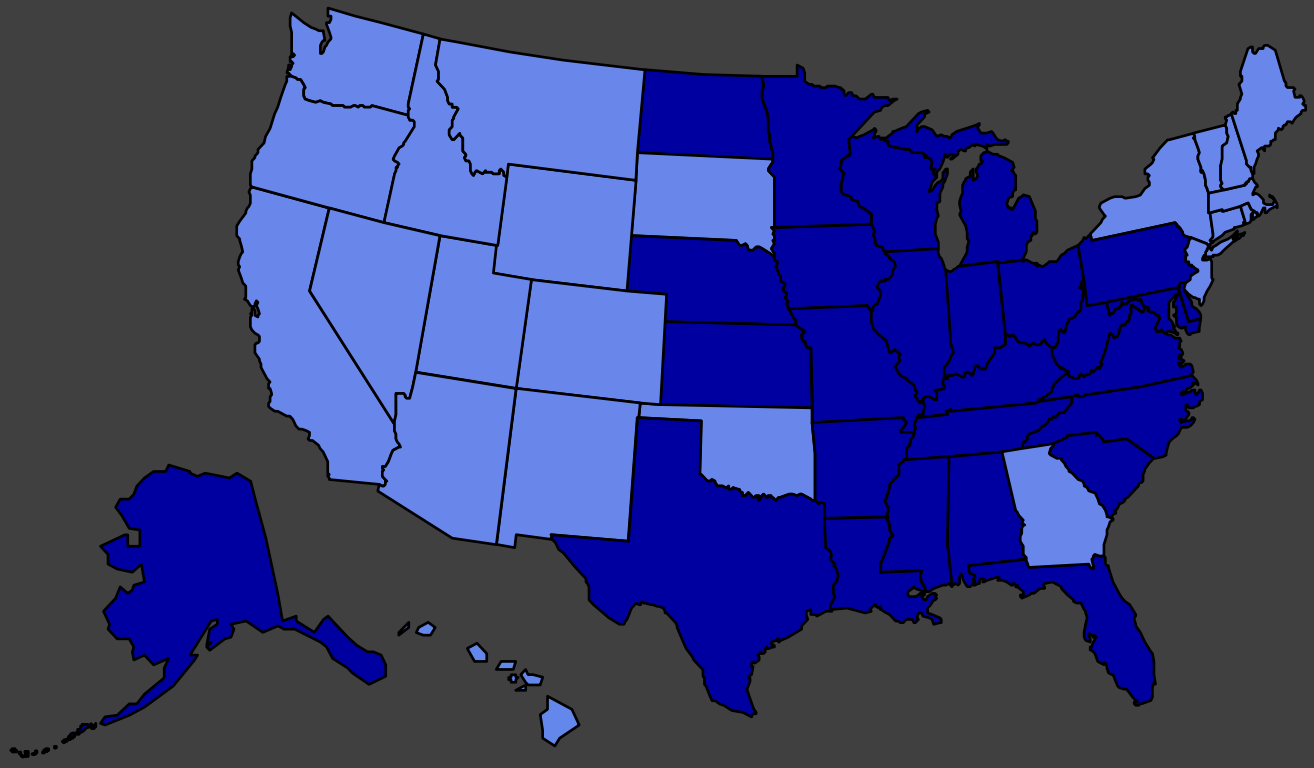

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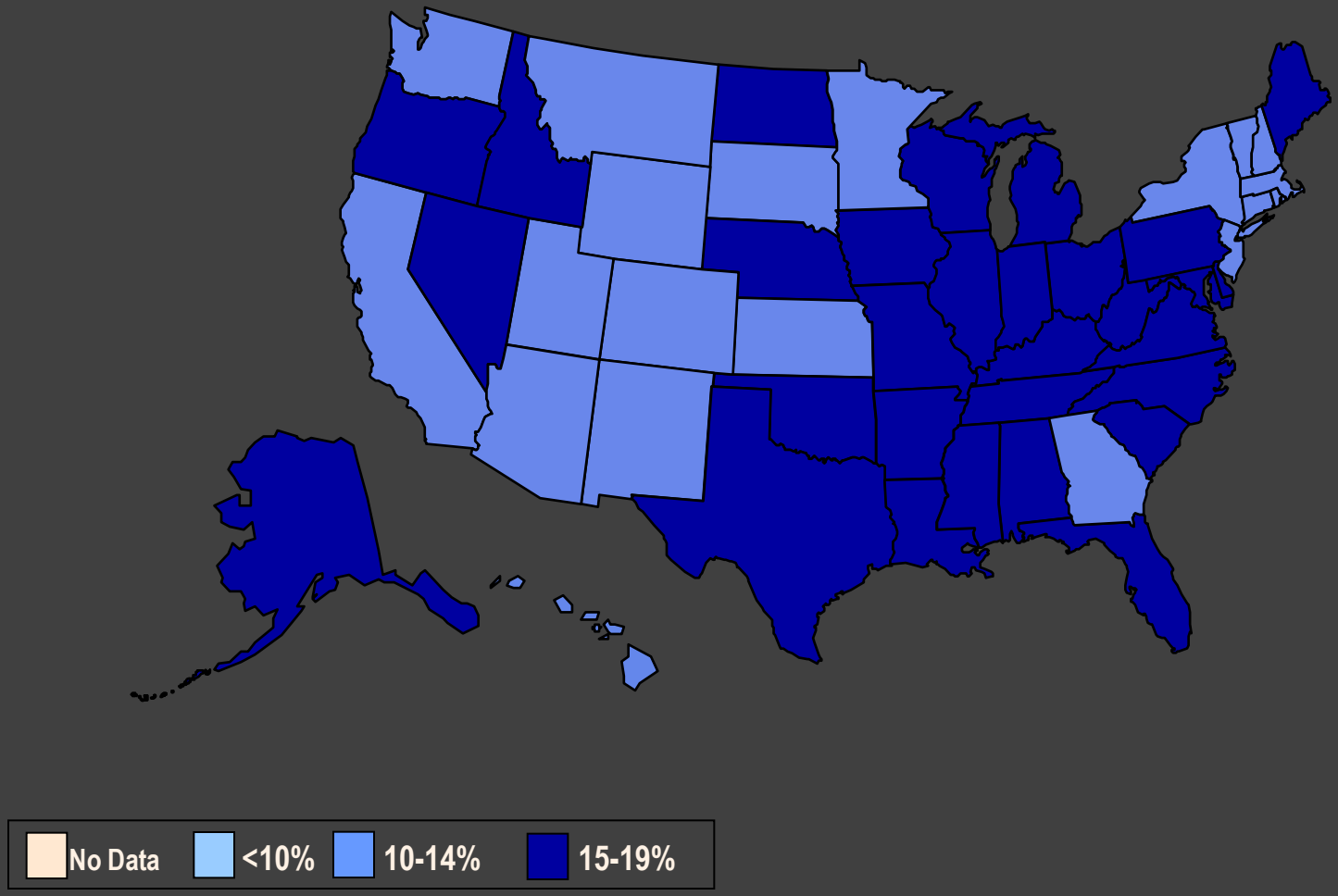

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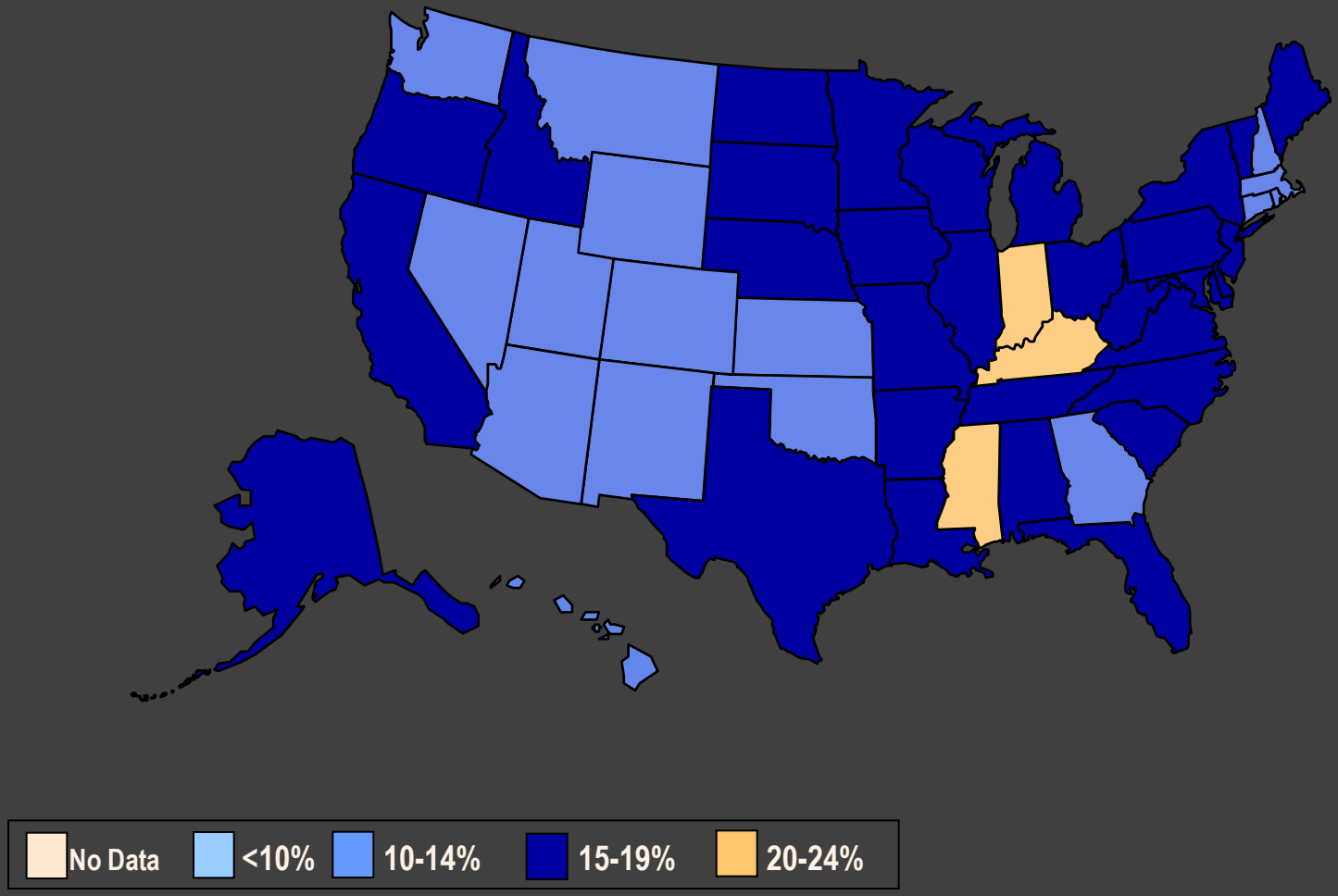

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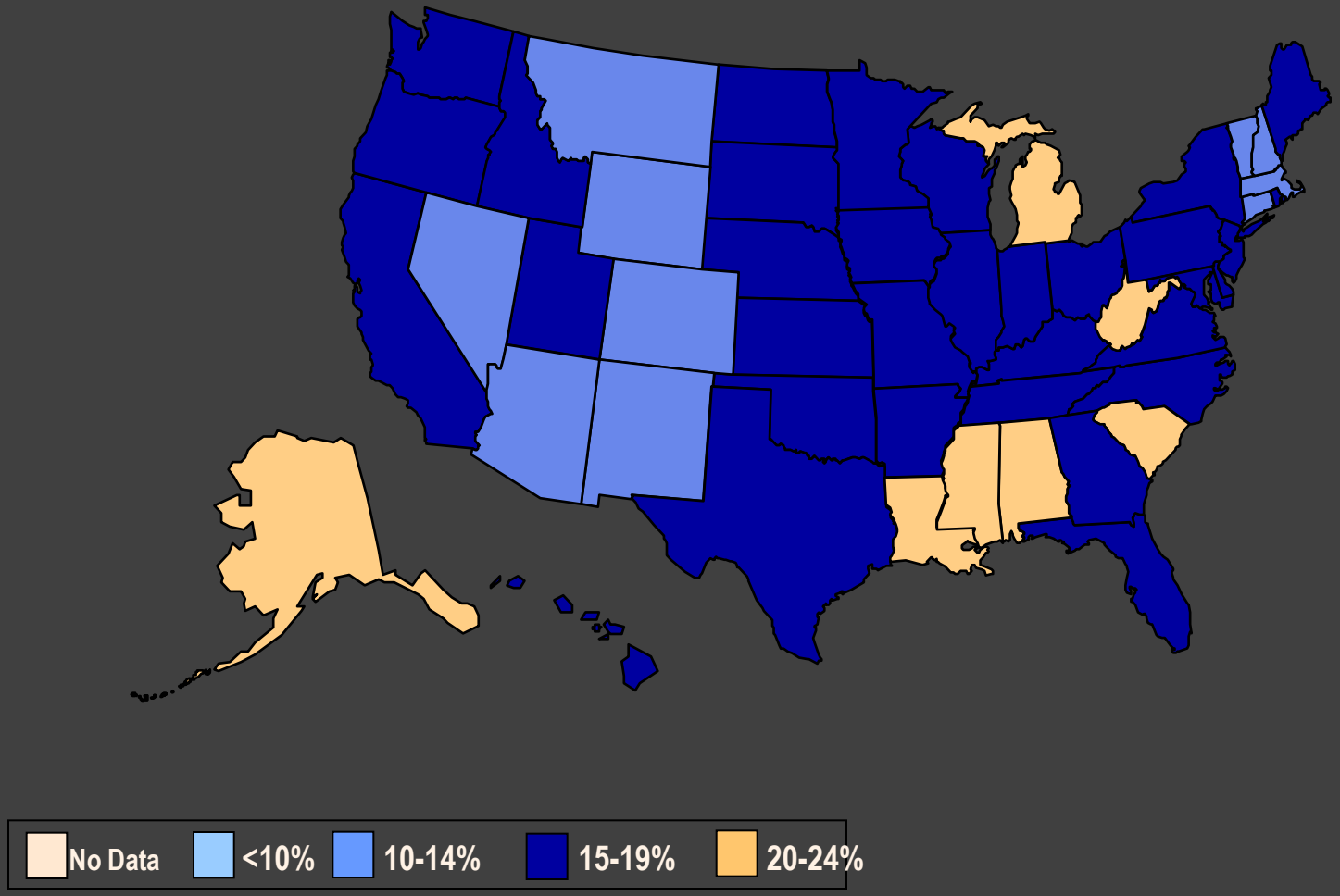

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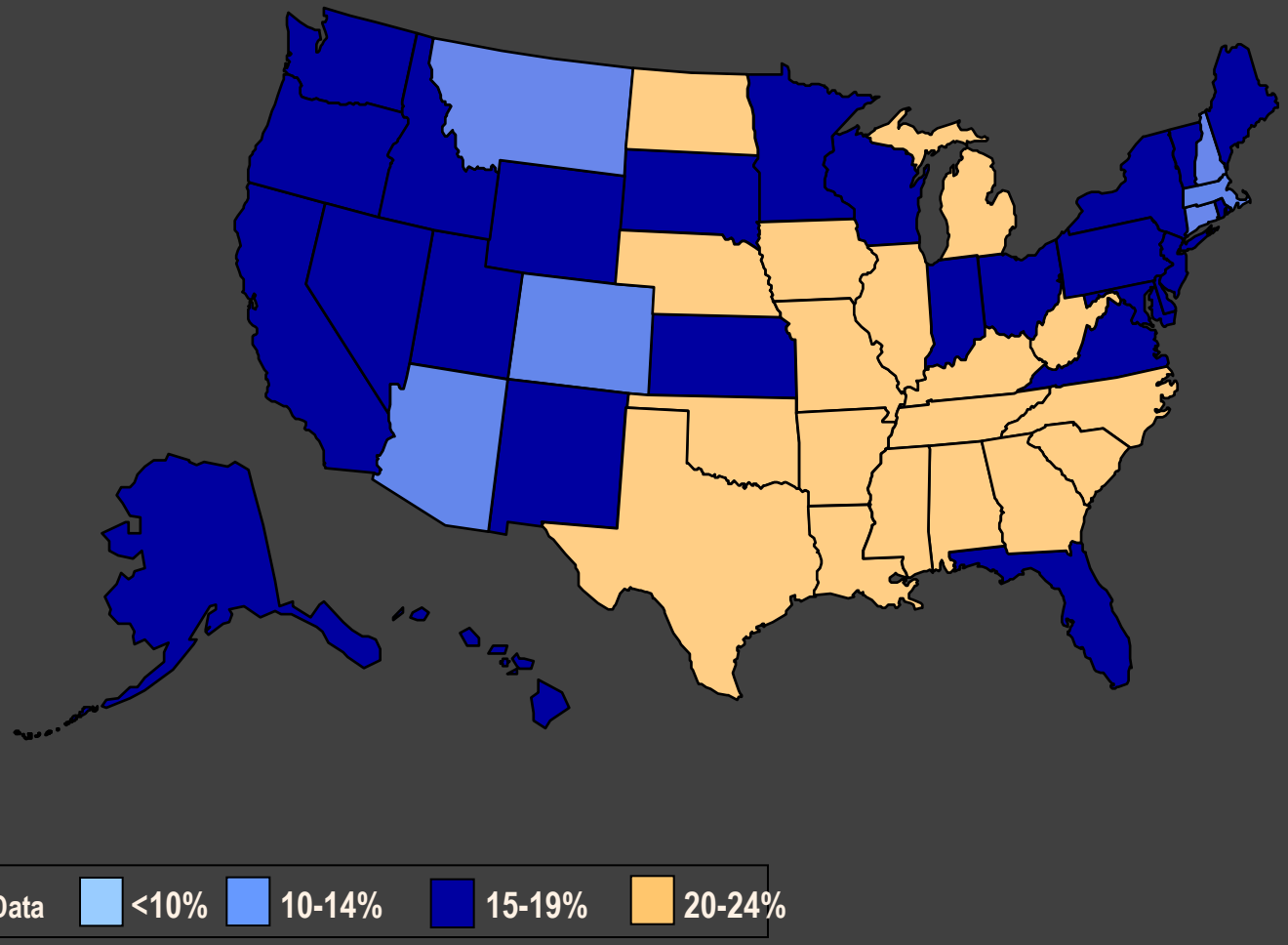

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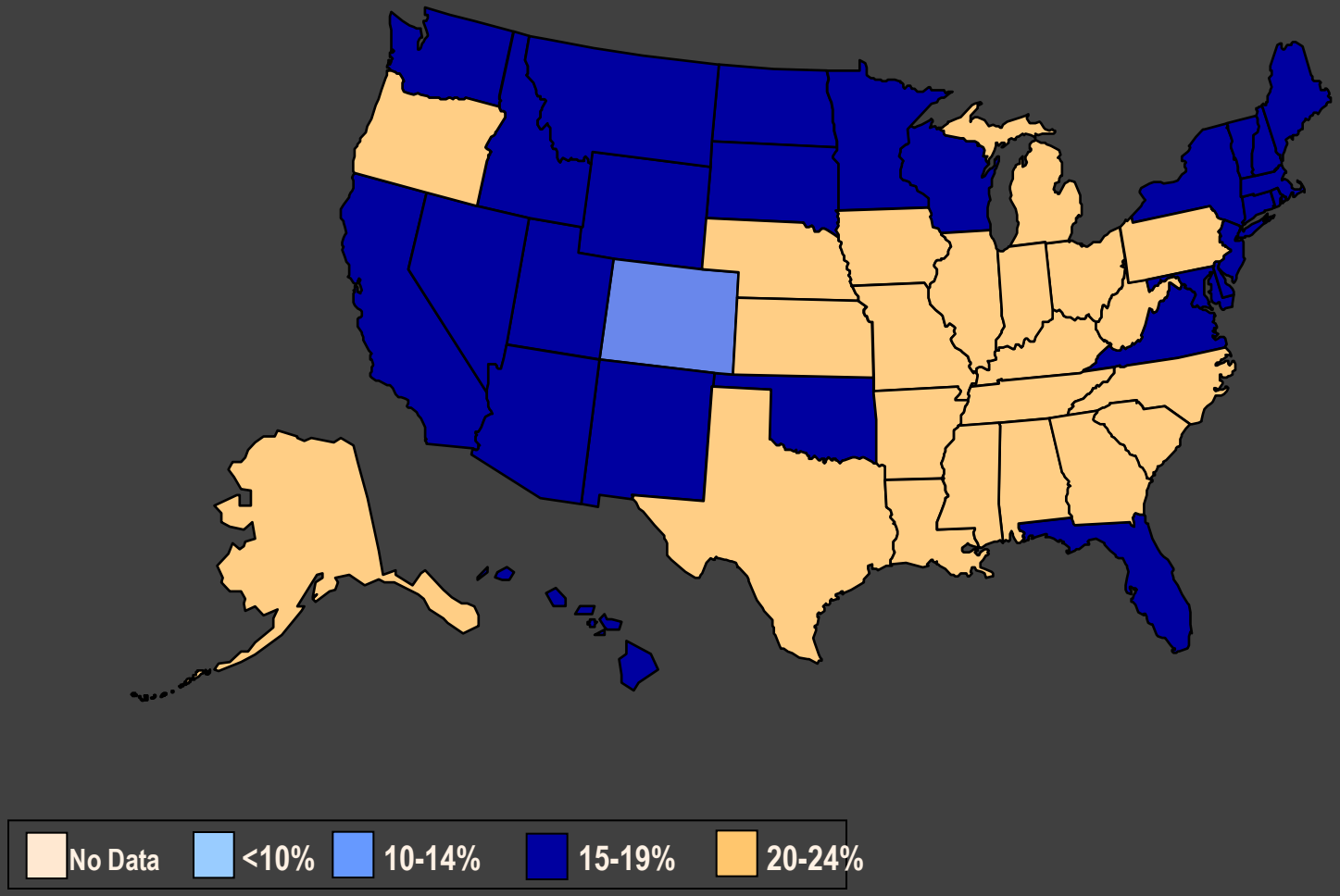

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BRFSS, 2001

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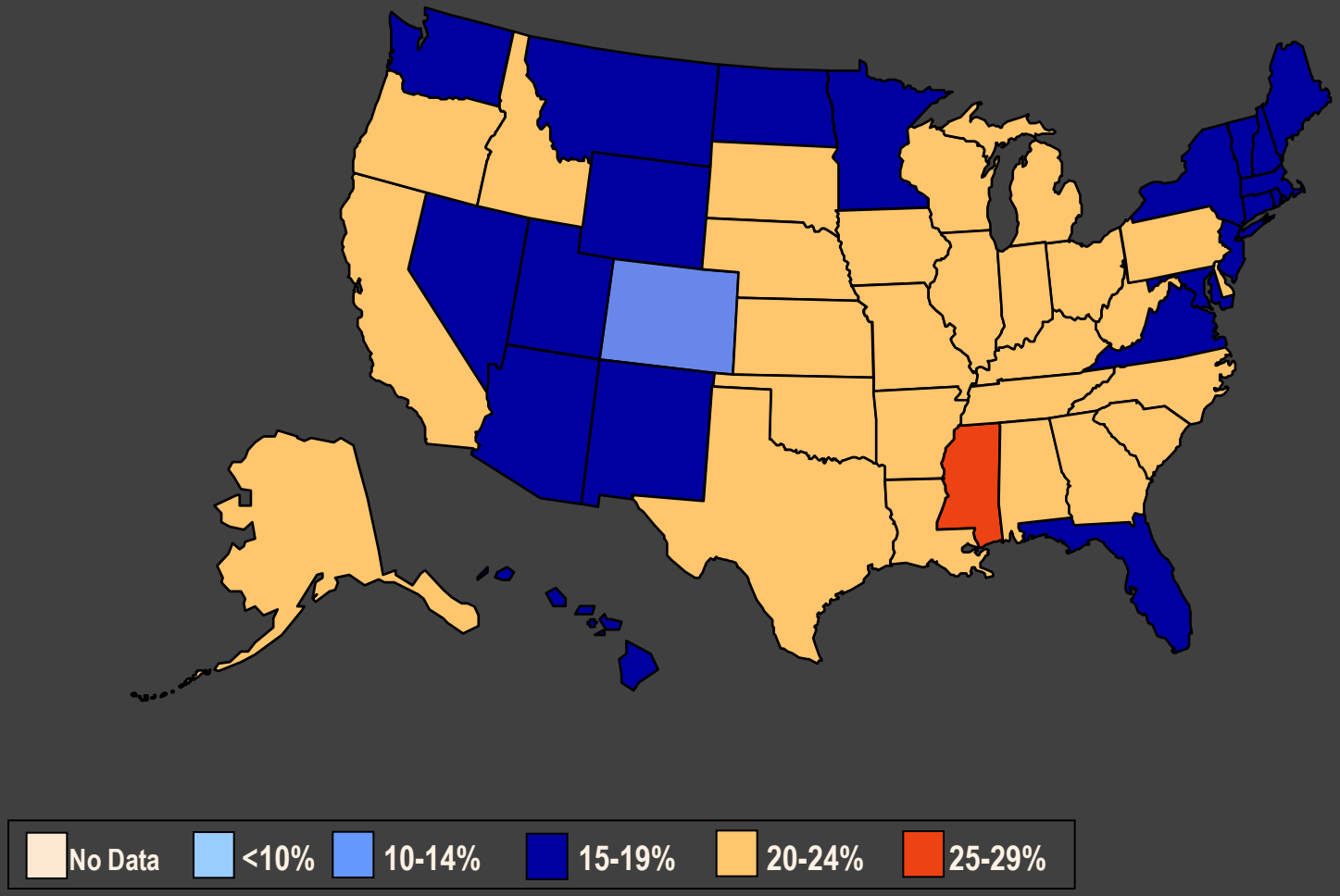

Obesity Trends* Among U.S. Adults
BRFSS, 2002

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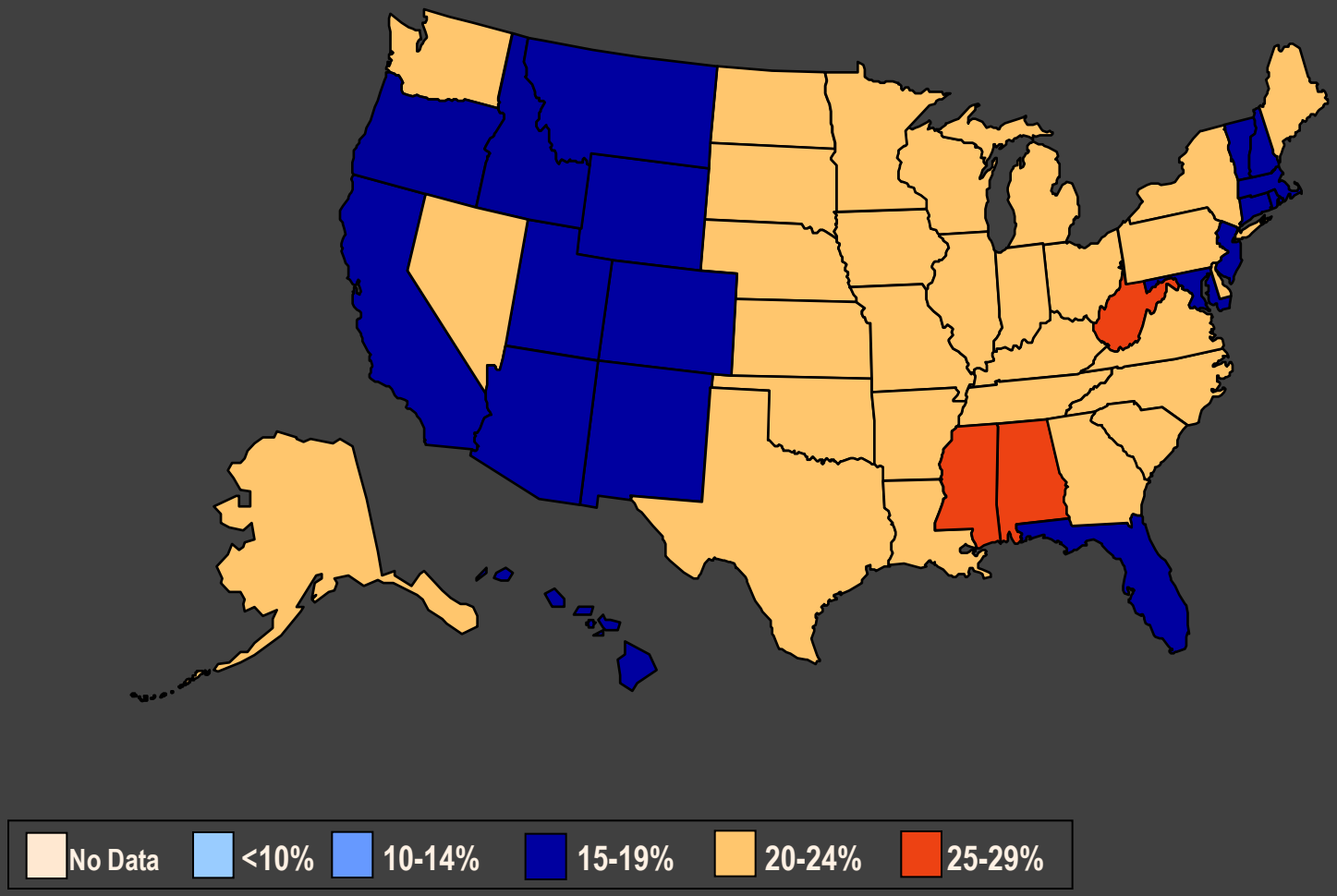

Obesity Trends* Among U.S. Adults
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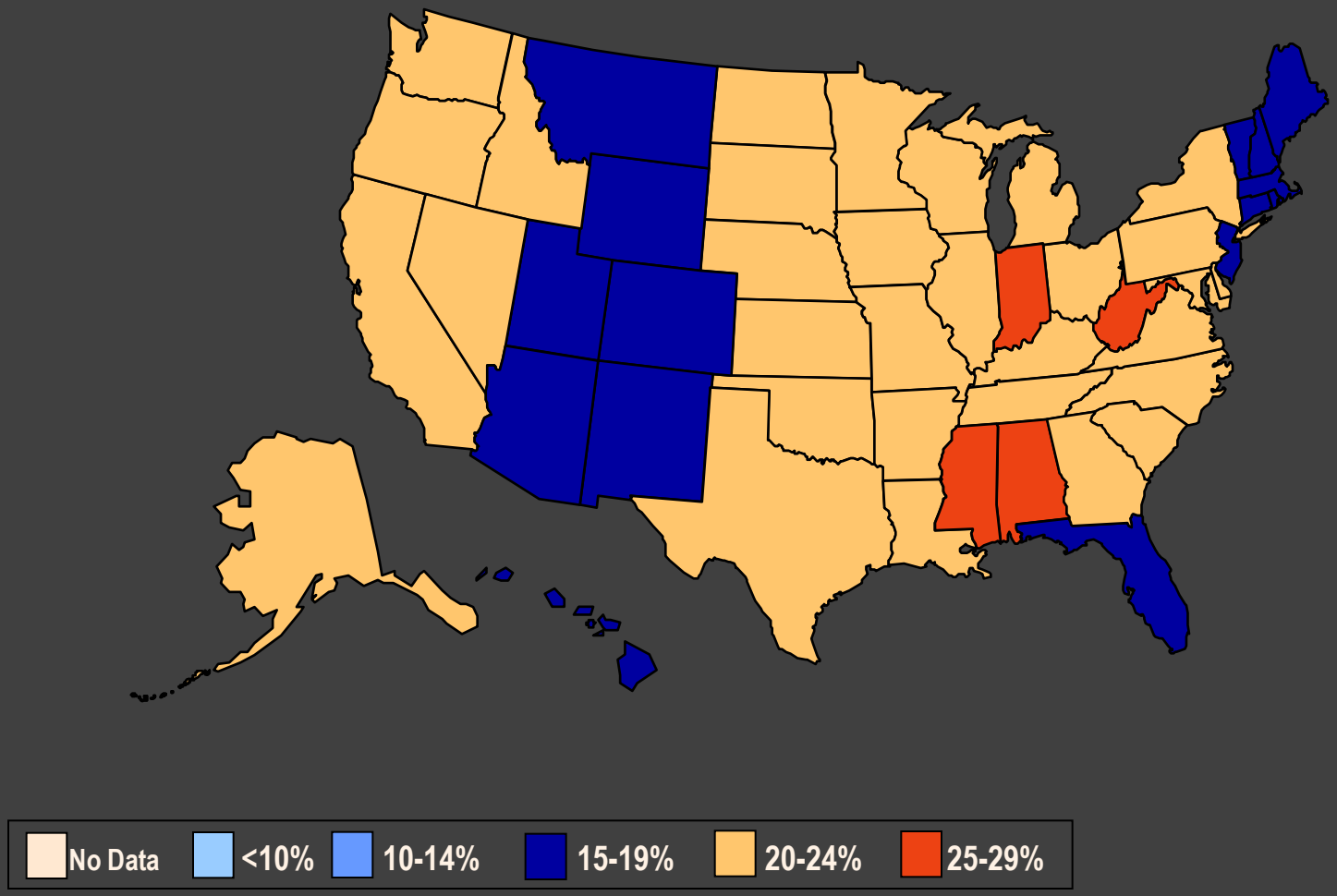

Obesity Trends* Among U.S. Adults
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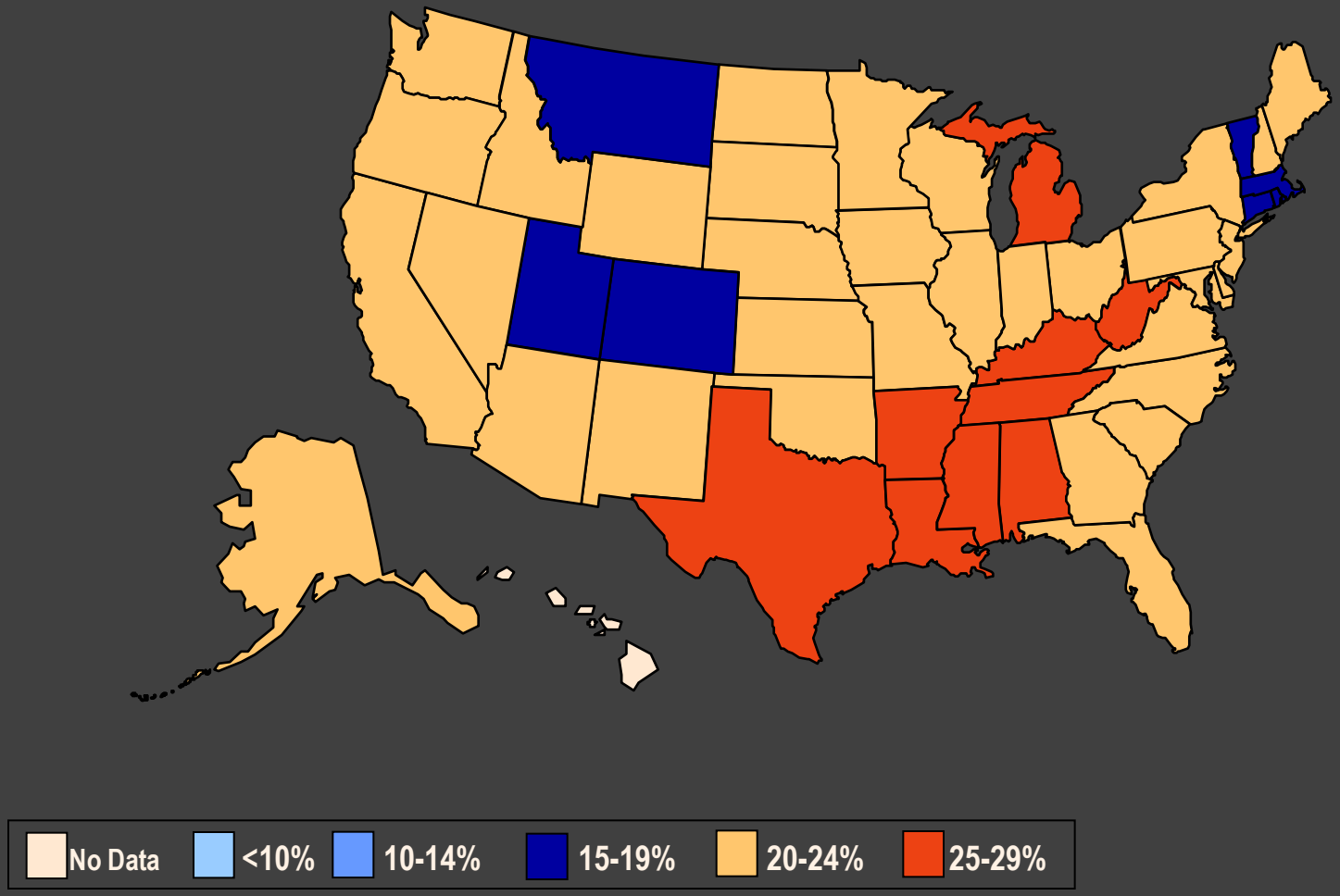

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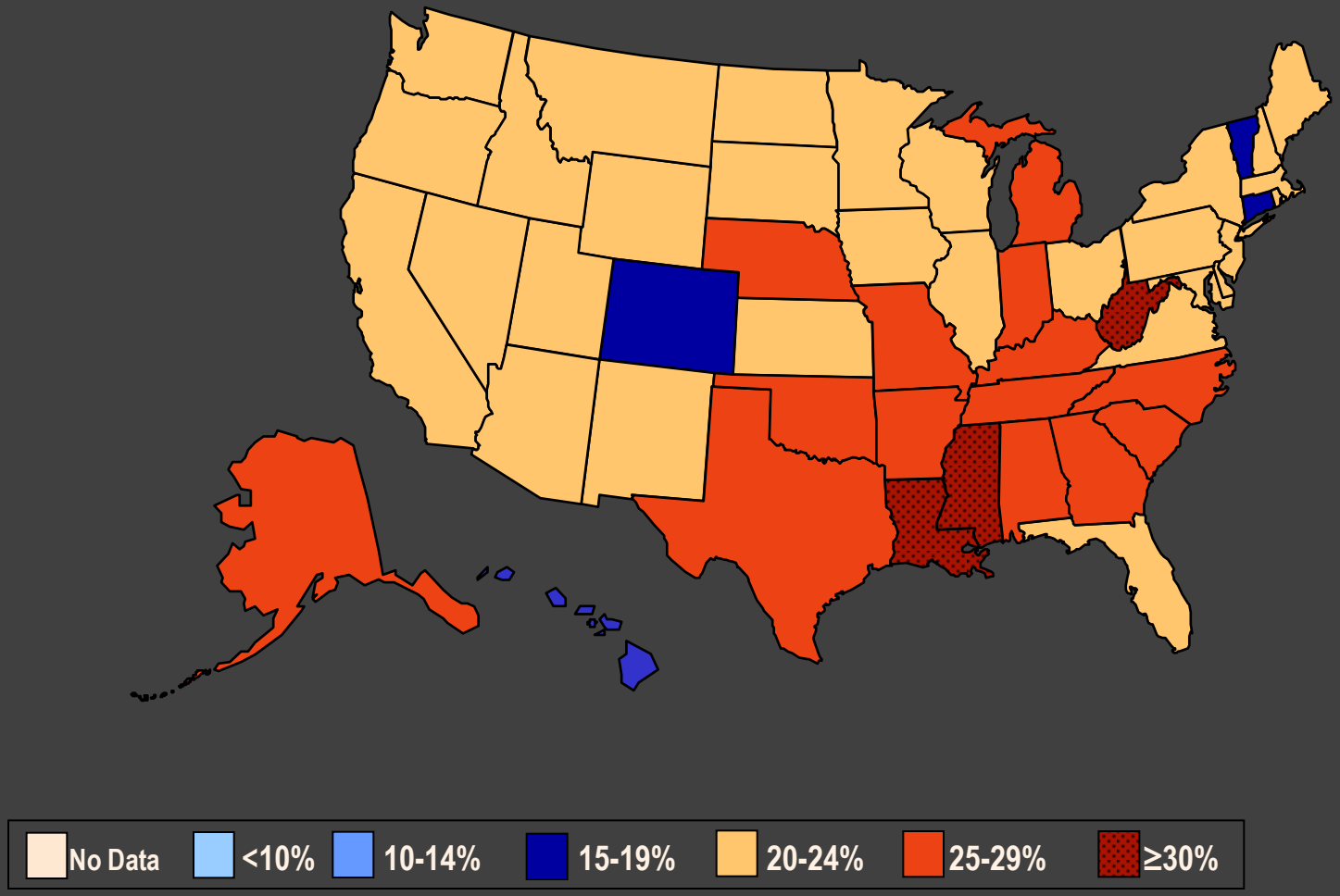

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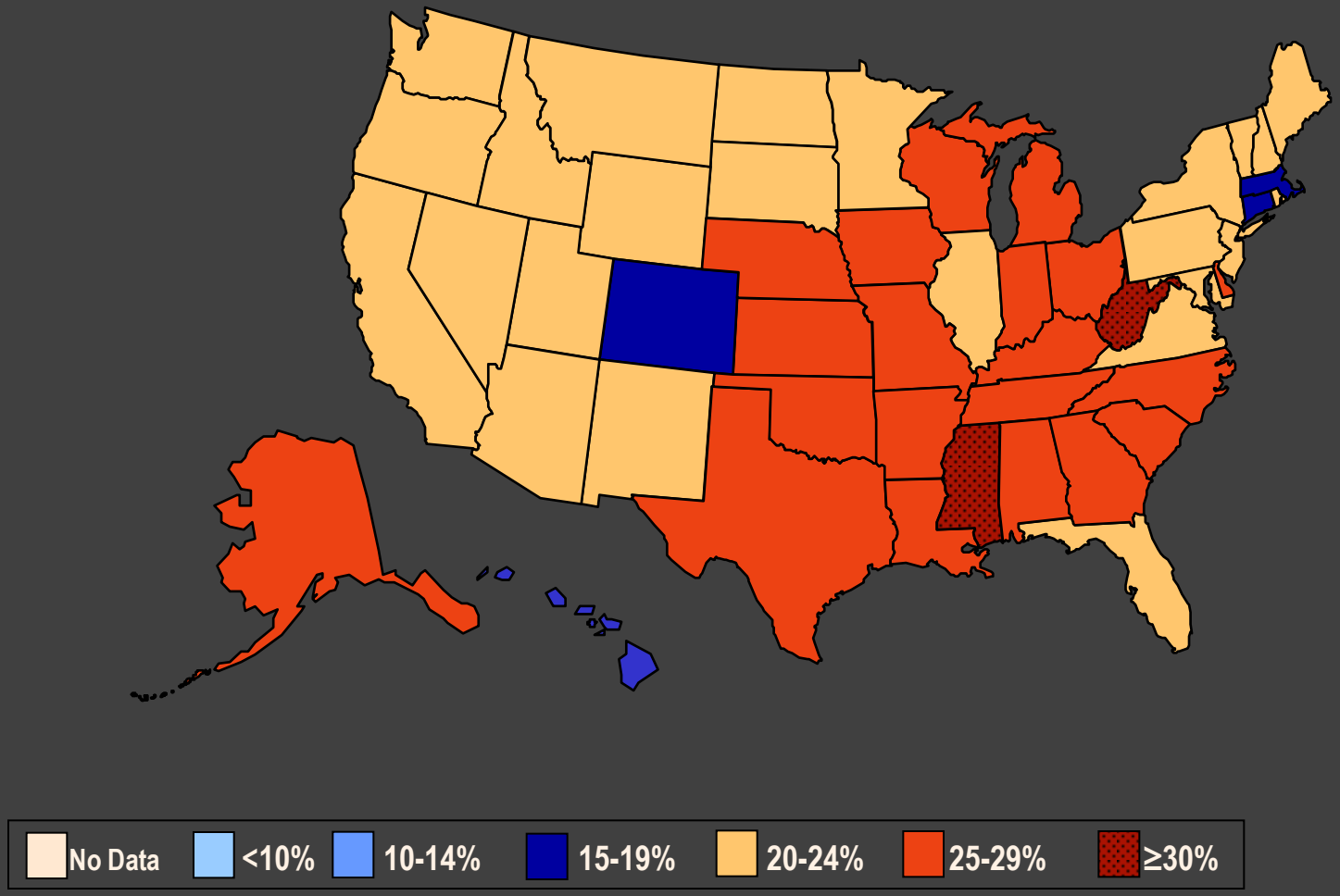

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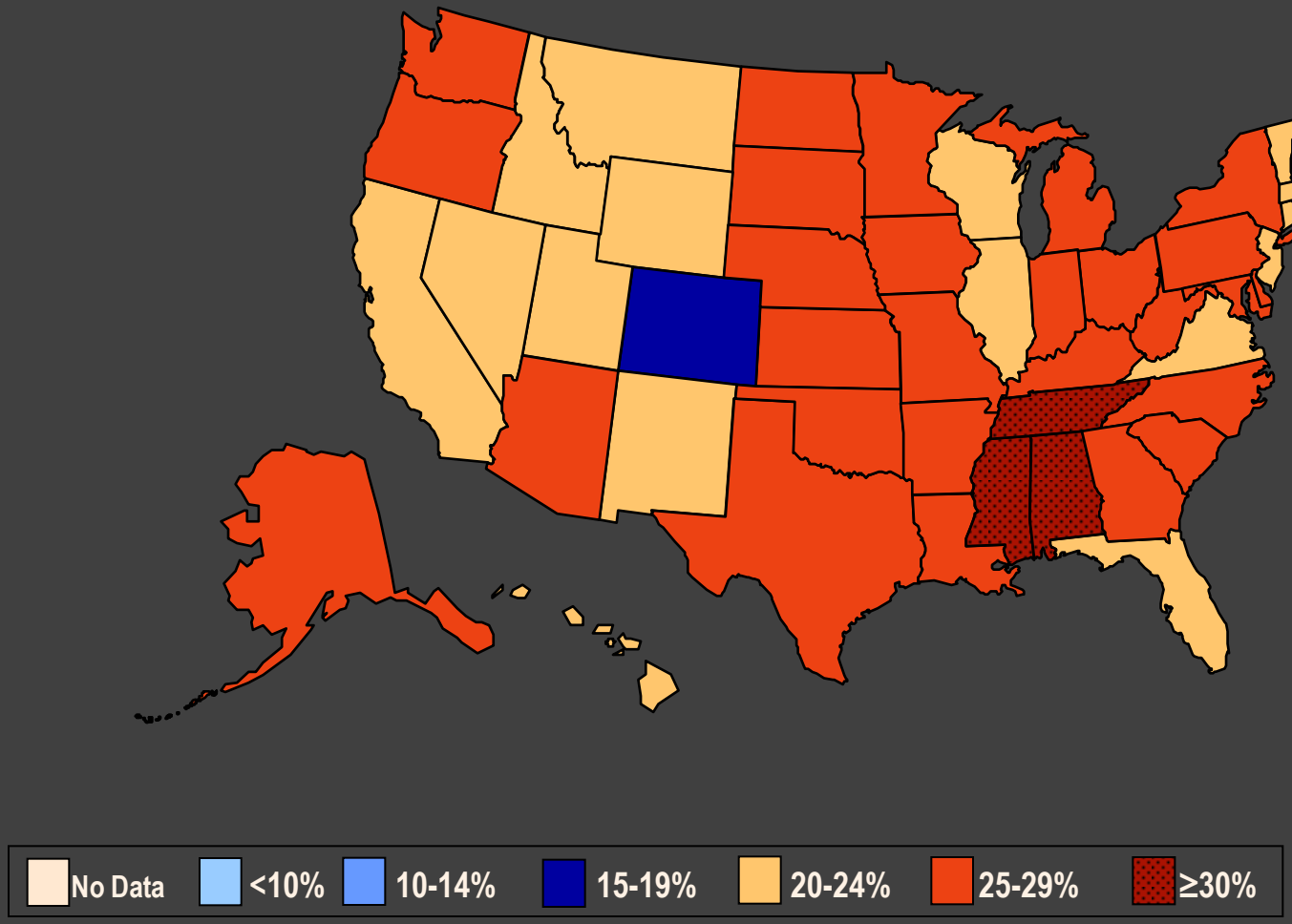

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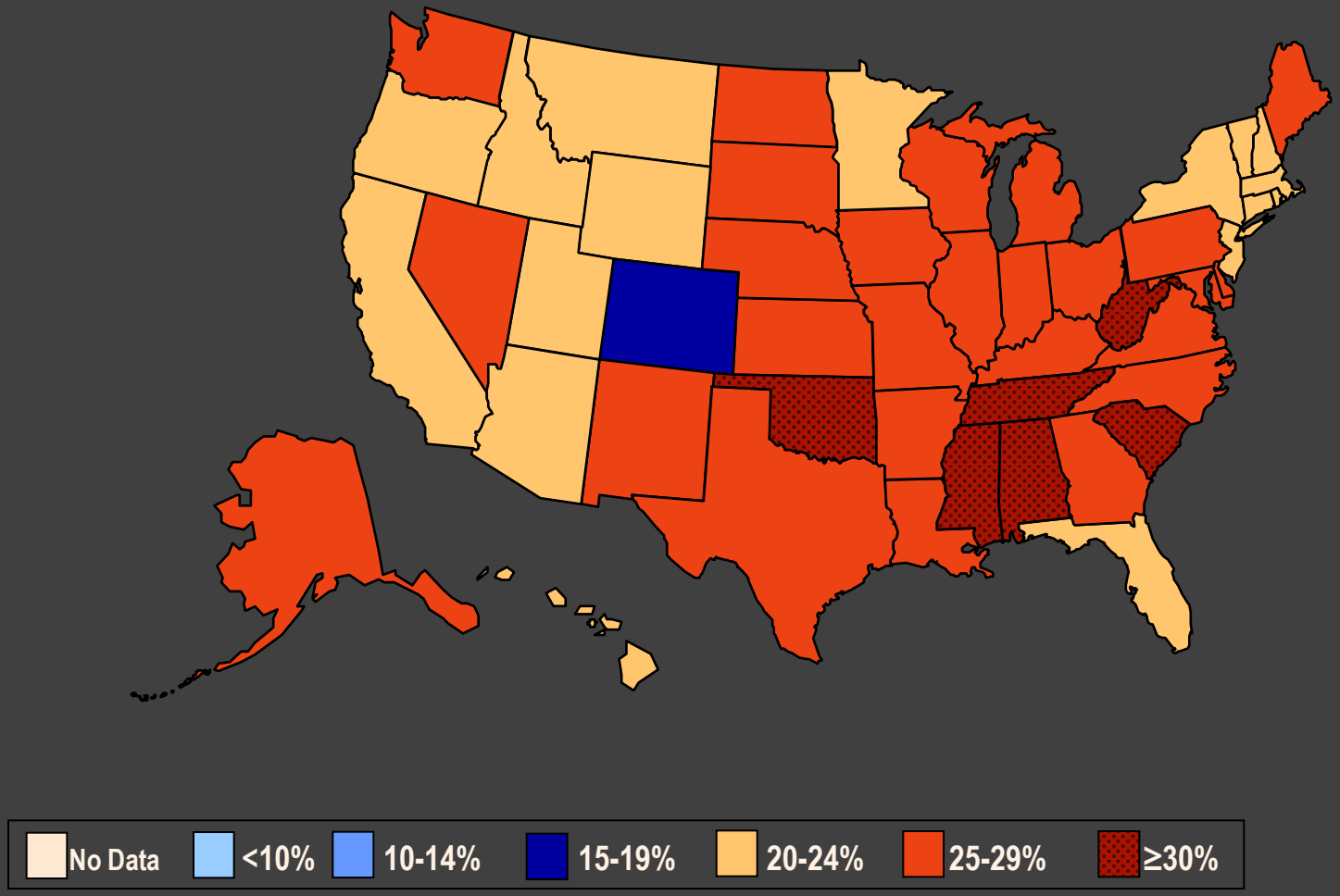

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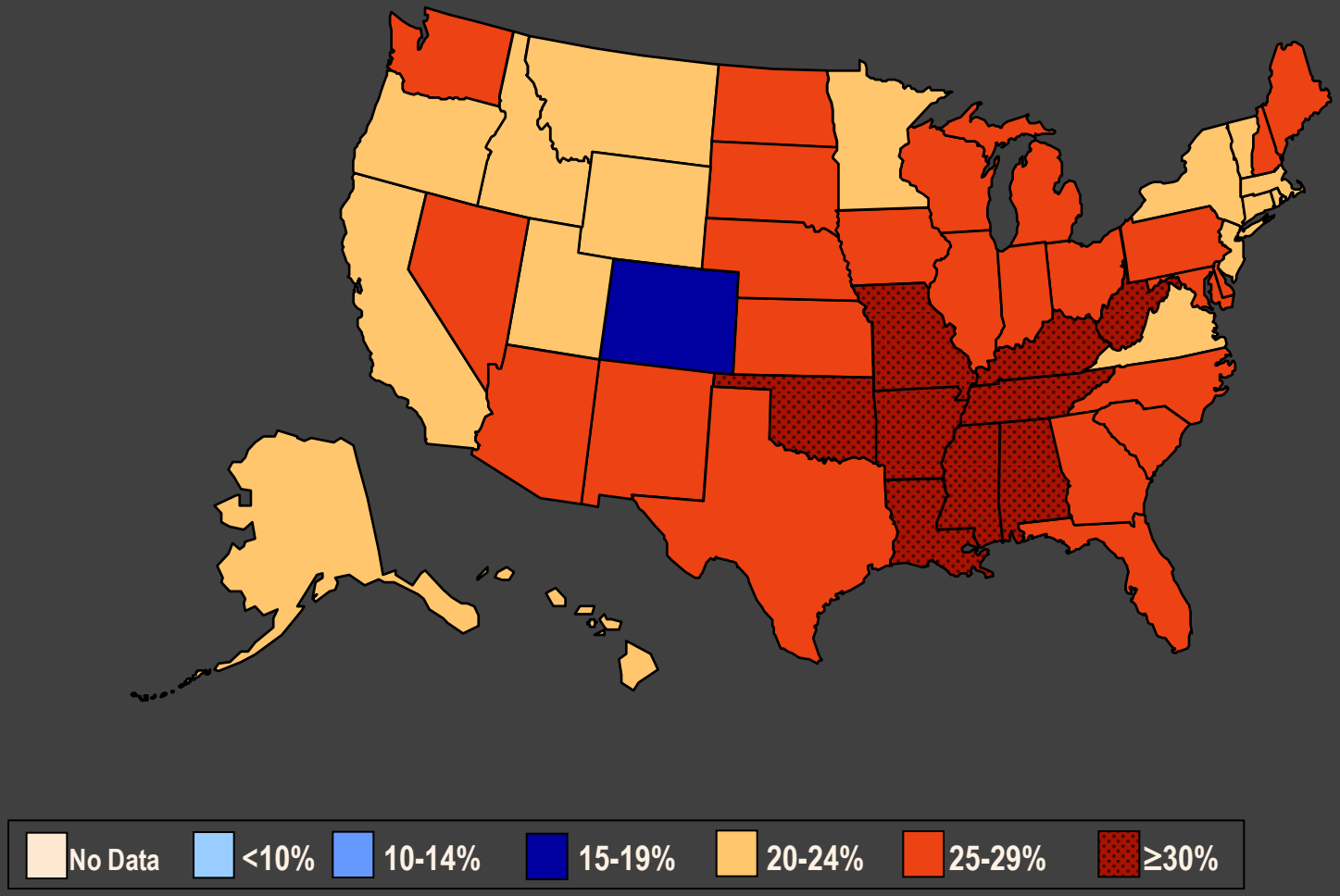


Typical city polices….

- Create mixed-used neighborhoods
- Add appropriate density near transit
- Reduce vehicle travel
- Promote bicycling and walking
- Build complete streets
- Honor motherhood
- Enjoy apple pie

Image source: Diabetes Daily

Image source: Dan Burden

Mixed message?

Image source: Diabetes Daily

Image source: Carbolic Smokeball

Transportation = Community Health

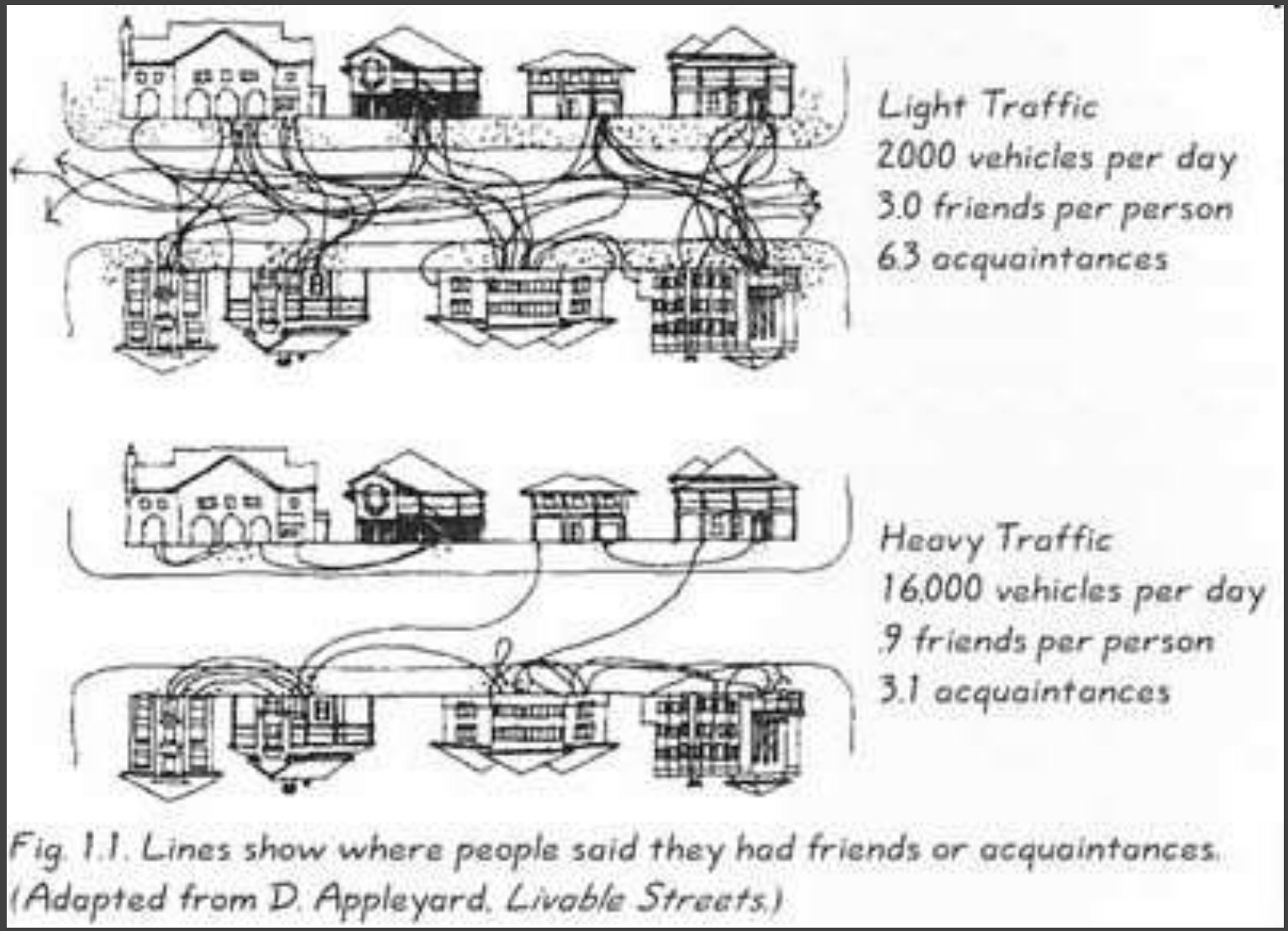


Fig. 1.1. Lines show where people said they had friends or acquaintances. (Adapted from D. Appleyard, *Livable Streets.*)

Image source: UC Press

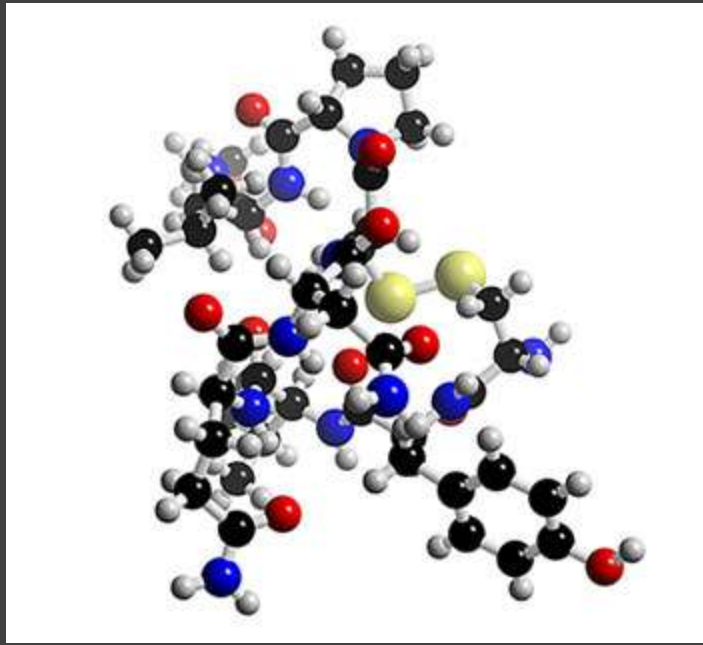
Green Exercise = Mental Health

- Short periods of outdoor exercise =
  - More self esteem
  - Better mood
  - Particular self esteem improvement in young and mentally ill.

Barton J and Pretty J. 2010. What is the Best Dose of Nature and Green Exercise for Improving Mental Health? A Multi-Study Analysis. *Environmental Science and Technology* DOI: 10.1021/es903183r

Oxytocin

- The "cuddle chemical"
- Lowers blood pressure and other stress-related responses
- Increases positive social behaviour such as friendliness
- Creates trust, generosity and empathy.



Nature **435, 673-676 (2 June 2005) | doi:10.1038/nature03701; Received 20 April 2005; Accepted 5 May 2005**
Oxytocin increases trust in humans. Michael Kosfeld, Markus Heinrichs, Paul J. Zak, Urs Fischbacher & Ernst Fehr

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Oxytocin release

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Oxytocin release

Source: http://teachingmedialiteracy.pbworks.com/AnalyzingPrintAds

Oxytocin release

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Anger, Will Robinson!

- Driving makes us:
  - –Fat
  - –Sick
  - –Die early
  - –Poor
  - –Dumb
  - –Angry
  - –Mistrustful

Image: A Tale of a Few Cities: How Sprawl Affects Your Waistline, By Chris Woolston, Consumer Health Interactive

- Walking makes us:
  - Fitter
  - Smarter
  - Able to handle complex reasoning
  - Sexier
  - More loving
  - More trustful

EPA1836

What can you do?
(*Do* try this at home)

1. Measure what matters

We use transportation performance measures for:

- Improving efficiency of system operations
- Managing a given road or corridor
- Prioritizing funding
- Reporting on achievement of various goals

What is transportation for?

- Transportation is not an end in itself
- It is merely a means by which we support individual and collective goals and objectives

How Transportation Meets Goals

- **Mobility:**
  - Can I travel freely and easily to where I want to go?
  - Reduce roadway congestion
  - Increase transit frequency, reliability and speed
  - Create bicycle lanes and complete sidewalks
- **Accessibility**
  - Can I get the things and services I want?
  - Bring people, goods and services closer together
  - Mix uses
  - Technology, delivery

Level of Service A

Level of Service F

What's important depends upon perspective

Traffic engineer:	**F**	**A**
Economist:	**A**	**F**

Measure what matters

Why not Consider…

- Economic Development
  - Job creation
  - Real estate value increase
  - Retail sales
- Quality of Life
  - Access to jobs
  - Access to shopping
  - Residential property value impact
- Social Justice
  - Do benefits accrue equitably?
  - Are investments spread equitably?
- Ecological Sustainability
  - VMT per capita (=CO_2, NO_x, runoff, etc.)
  - Land use/transportation connection

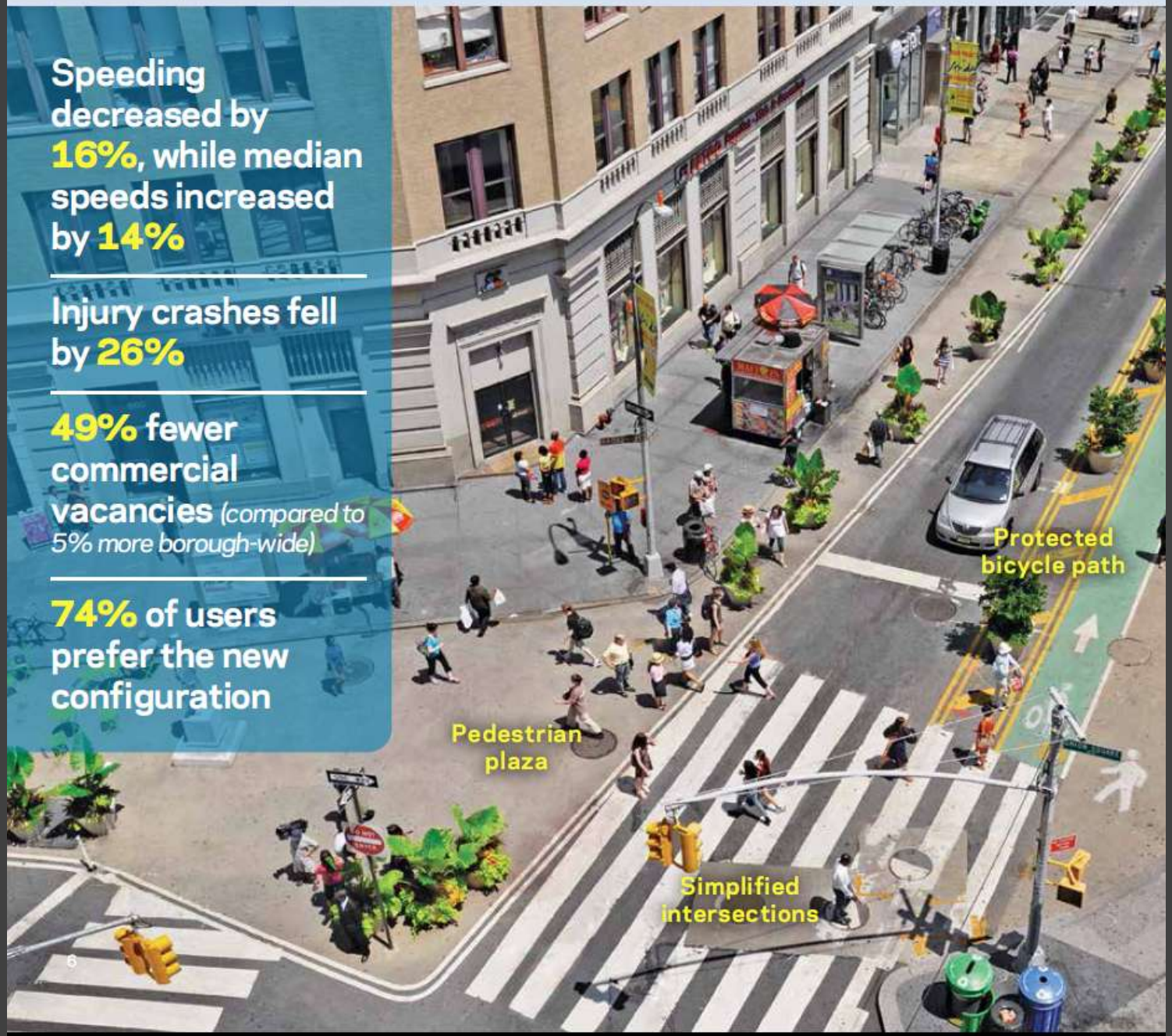
Some performance measures

- **Eliminate *vehicle* delay and substitute *person* delay**
- **Eliminate *Level* of Service and substitute *Quality* of Service ...*for all modes of travel***

2. Make Walking a Pleasure

Plant Trees

Expanding an iconic space:
Union Square North (Manhattan)



Transforming an underused parking area:
Pearl Street (Brooklyn)

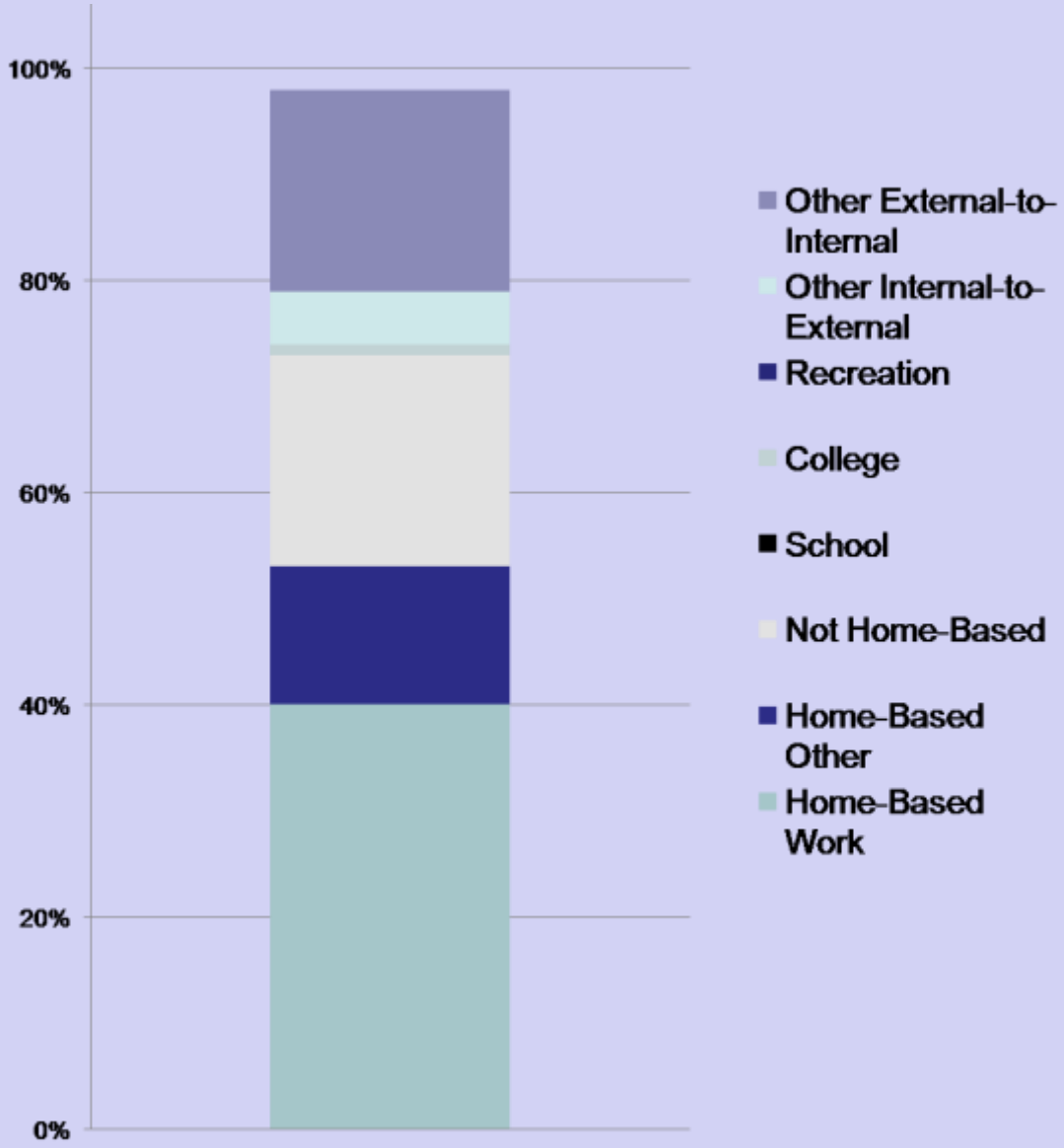
Creating a seating area out of curb lane:
Pearl Street (Manhattan)

3. Put the needs of daily life in walking distance

Image source: Wikipedia Commons, Balazs Barnucz

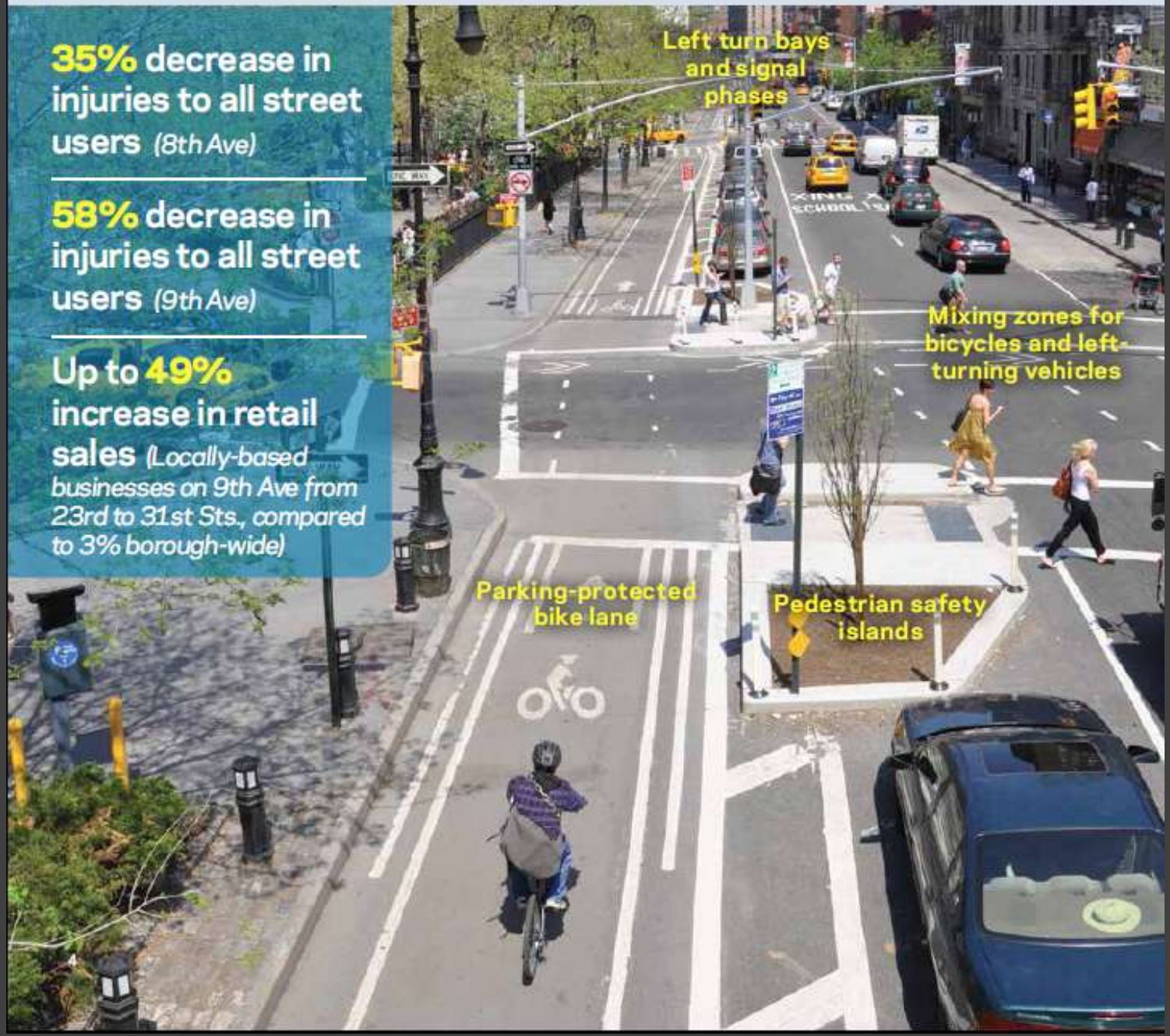
Most traffic isn't commute

- About 80% of trips are non-commute
- In PM Peak, only 40% are commute
- About same share are errands, visiting, etc.



4. Make cycling comfortable for all ages

First protected bicycle lane in the US:
8th and 9th Avenues (Manhattan)

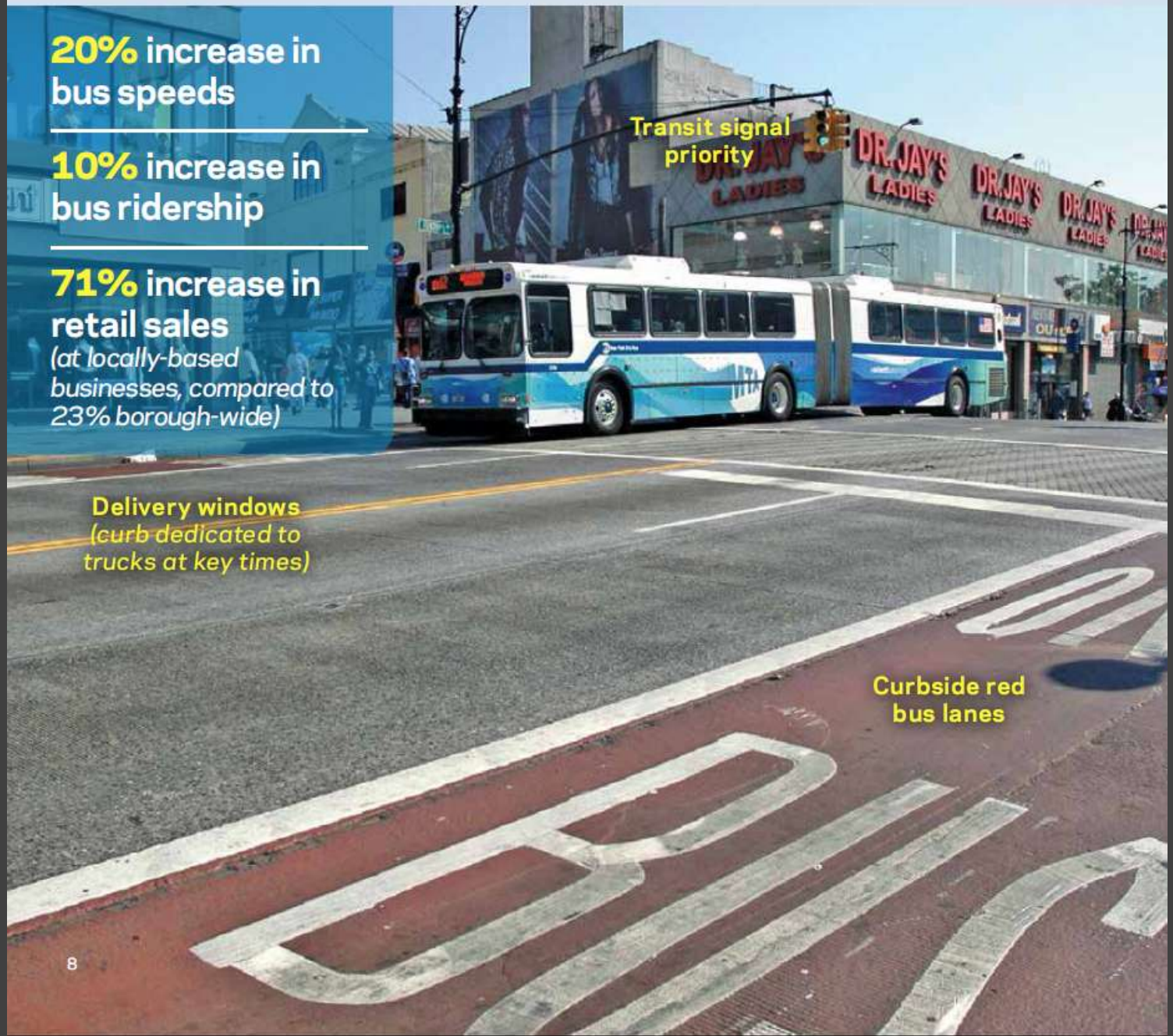


5. Make Transit Fast, Frequent, Reliable, and Dignified

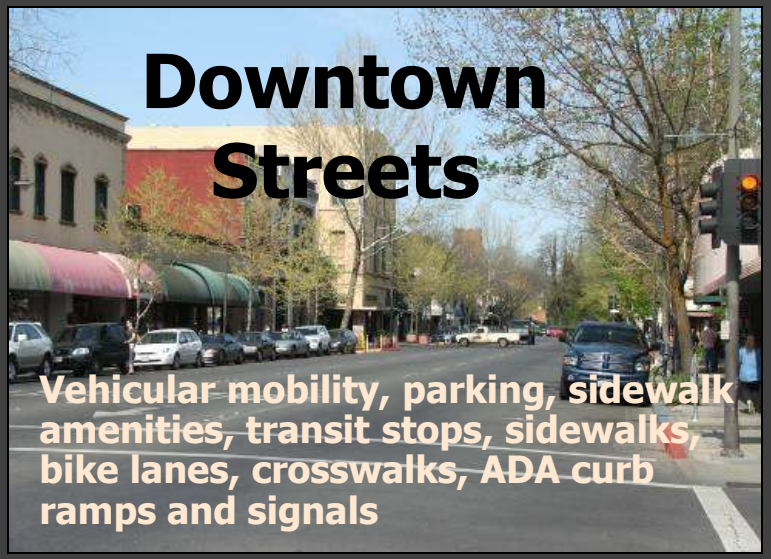
Rules for Transit Success

- **Follow the density**
- **Make routes simple and memorable**
- **Prioritize corridors where transit competes with car**
- **Run every 10 minutes or better all day long**
- **Make vehicles and stops urbane and dignified**
- **Use low floor vehicles**
- **Make it easy to pay, but don't make driver check fares**
- **Optimize stop spacing**
- **Focus on *person* delay for managing intersections**

Making bus routes work better:
Fordham Road (Bronx)

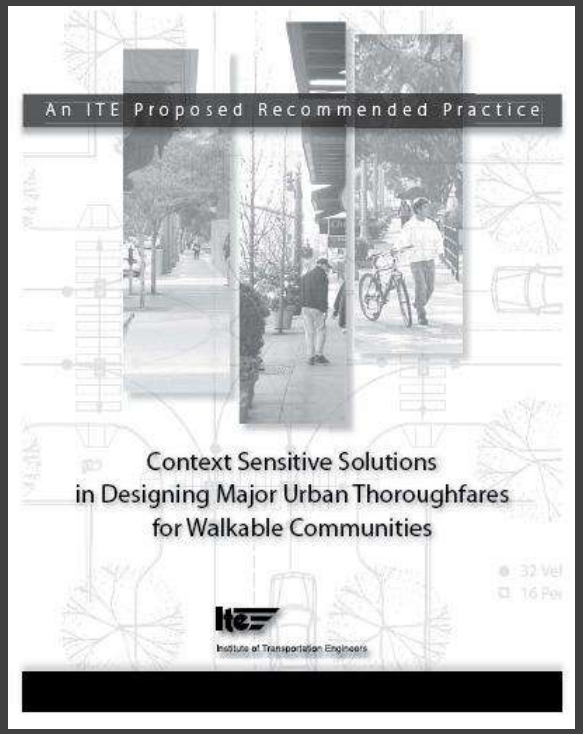


5. Adopt the right street design manual



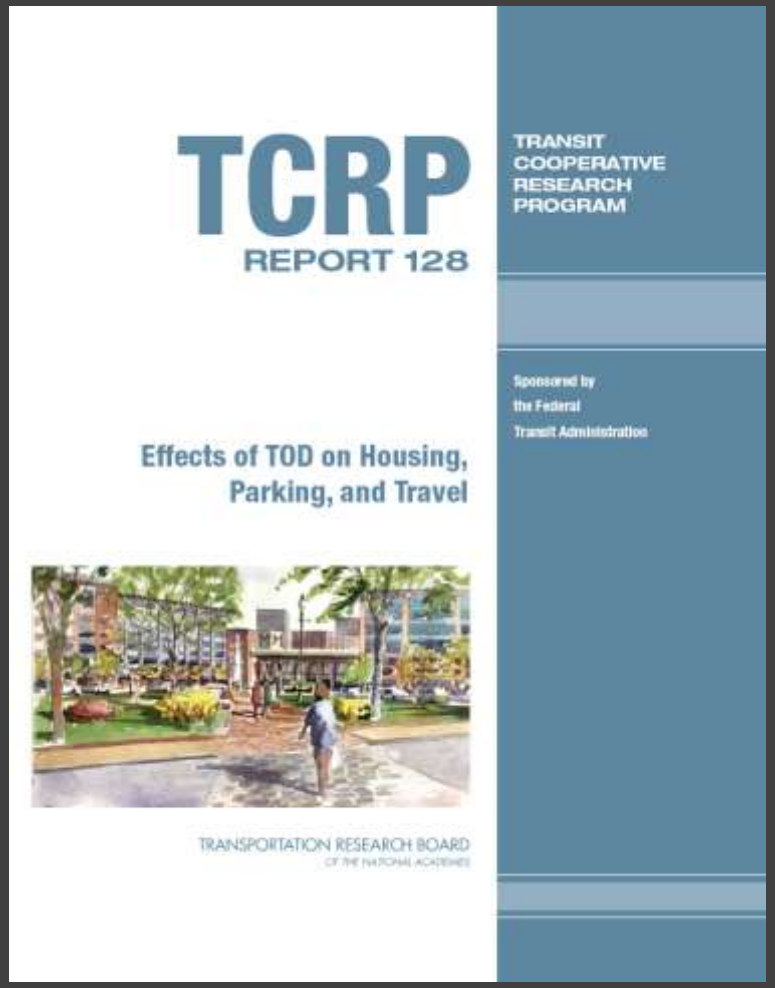
Adopt *urban* street guidelines

- **ITE *Context Sensitive Solutions***
  - Free at ite.com/css
  - Best for arterials
- **ITE *Residential Streets***
  - Best for residential streets
- **NACTO**
  - Free at nacto.org
  - Bikeways available now. Urban Street Design Manual out soon.
- **Steal from other cities**
  - SF, Boston, Indianapolis, NYC



7. Make traffic analysis smart

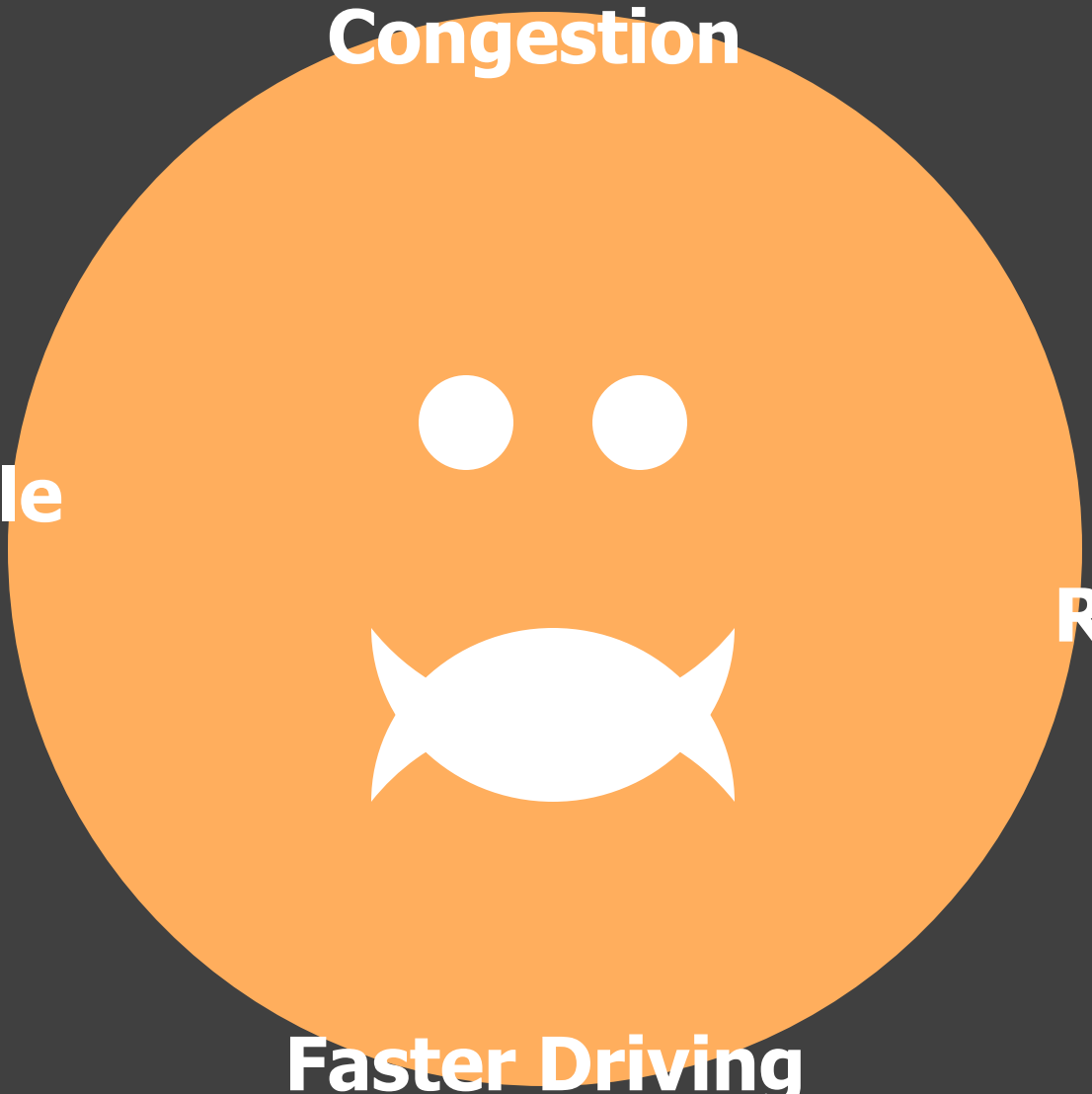
- To be "conservative," transportation analyses typically use ITE trip generation rates, data from isolated, single-use projects with no access except by car.
- TODs typically generate ~50% fewer vehicle trips than predicted by ITE. ("Effects of TOD on Parking, Housing and Travel," TCRP 128, 2008)
- Guidelines focus on localized traffic impacts and ignores regional impacts.



Typical transportation analysis

- To mitigate a negative transportation impact:
  - Reduce density
  - Widen roadways
  - Transportation Demand Management
  - Add parking
  - Move the project to a more isolated location with less existing traffic congestion
- Traffic analysis makes it a lot easier to do sprawl and a lot harder to do infill and TOD.

Induced and Latent Demand



8. Price it right

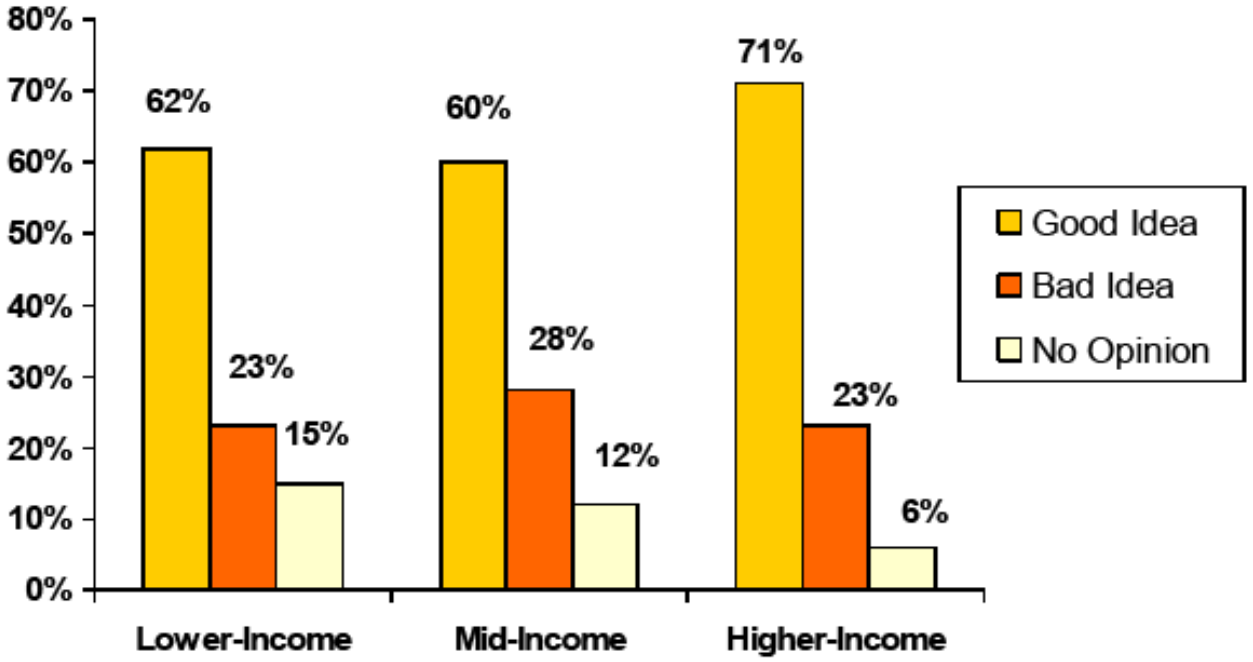
- Peak period pricing is common in many US industries

Pricing

…But not in the transportation sector

HOT lanes are popular

Minneapolis: What do you think of allowing single drivers to use the carpool lanes by paying a toll?

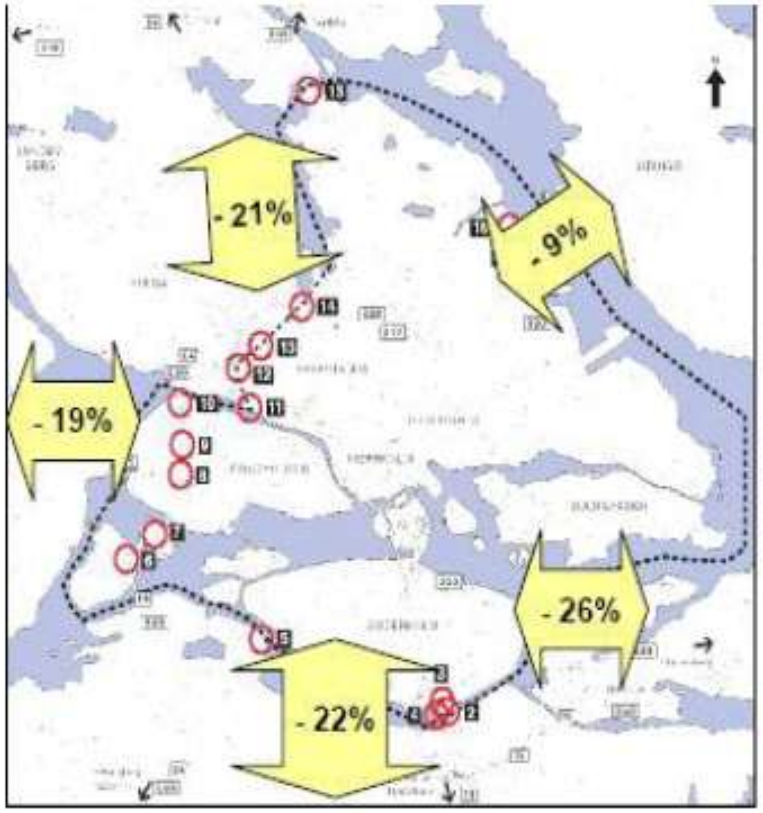


After 6 months of operation

Source: NuStats Presentation

But full congestion pricing is more effective

- Toll per trip as low as $1.50
- 9% to 26% reduction in traffic at cordon locations
- 10% to 14% reduction in inner city emissions
- 40,000 increase in transit trips per day



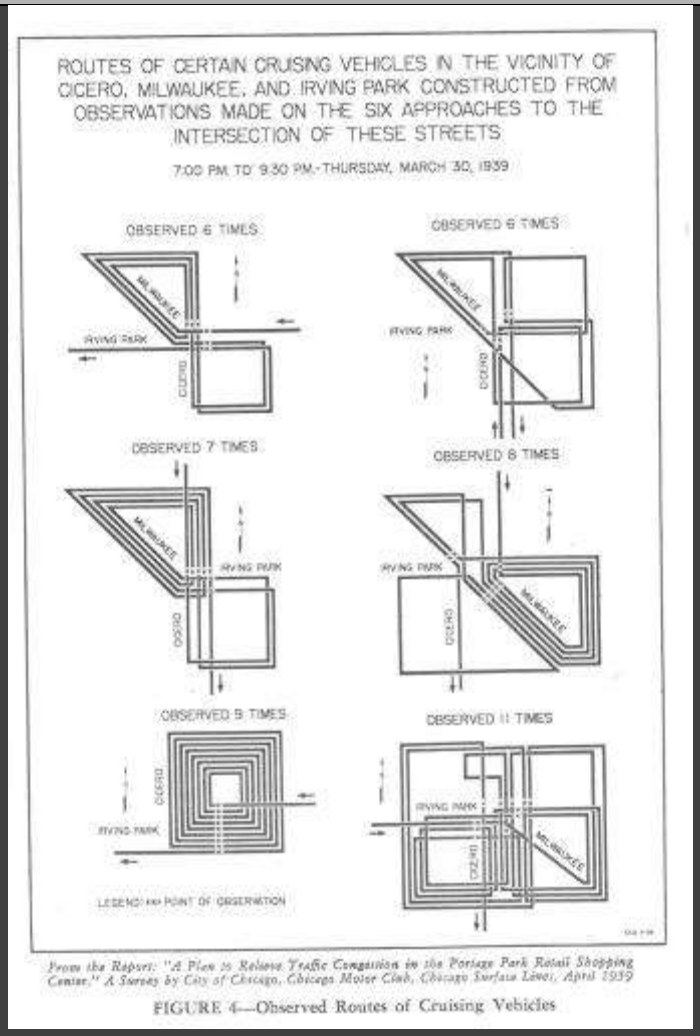
Source: IBM

9. Manage Parking

1. Eliminate minimum parking requirements
2. Create a "Park Once," shared parking environment
3. Charge the right price for curb parking
4. Manage parking in order to achieve development and congestion management goals context and goals

Parking Produces Traffic Congestion

- Every parking space is a magnet for cars. Why provide more parking than you have traffic capacity to access that parking?
- Poorly managed parking results in motorists circling for a parking space, from 8 to 74% of traffic in many downtowns.
- Eliminating just 10% of vehicles from any congested location makes traffic free flowing.



From the Report: "A Plan to Relieve Traffic Congestion in the Portage Park Retail Shopping Center," A Survey by City of Chicago, Chicago Motor Club, Chicago Surface Lines, April 1939

FIGURE 4—Observed Routes of Cruising Vehicles

Sources: "Cruising for Parking," Don Shoup, 2006.

Smart Technology

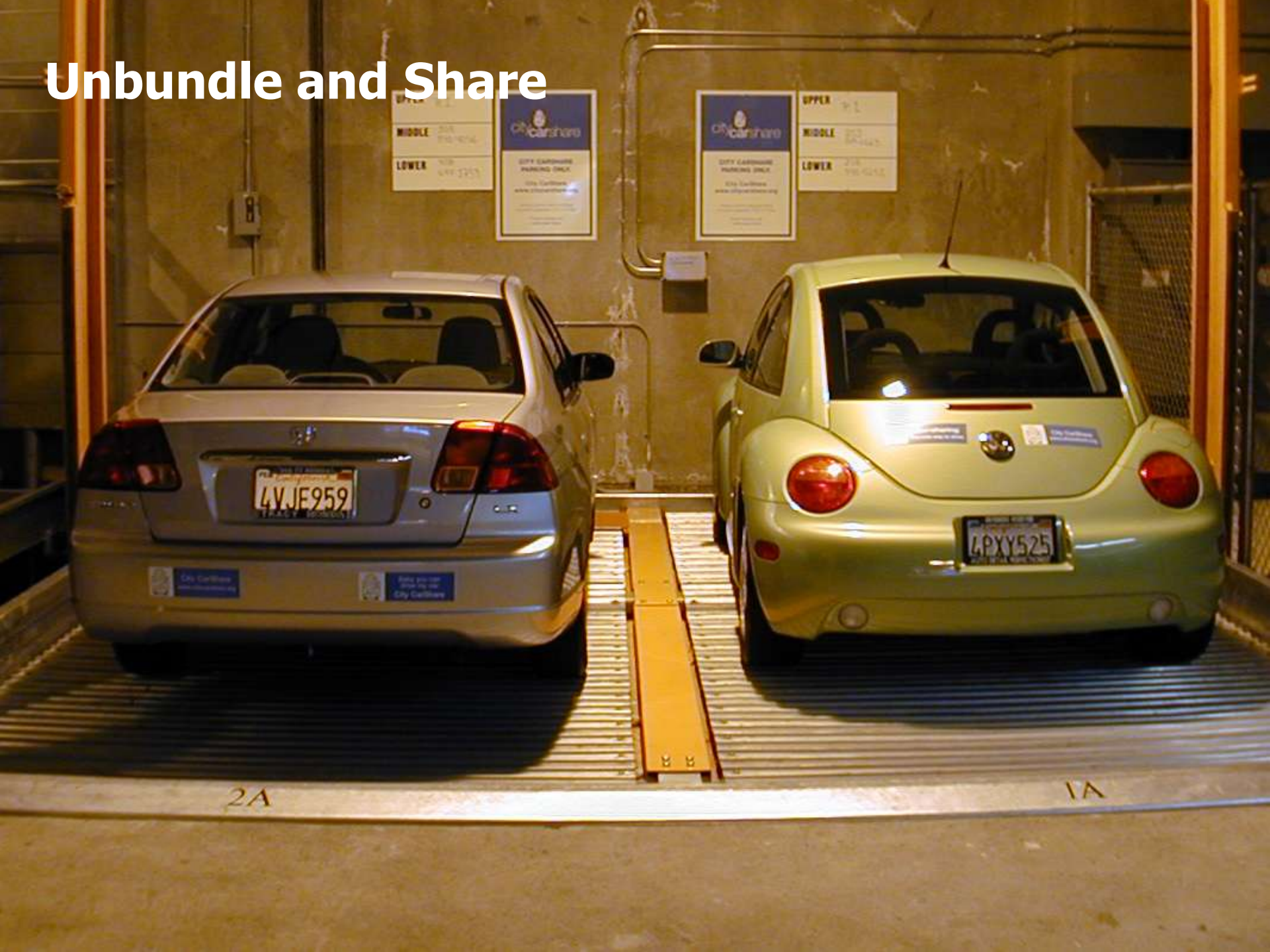
Downtown
Parking Map
Right Price
County Garage
San Mateo County Government Center
ALDEN
BREWSTER
FULLER
WARREN
BRADFORD
WINSLOW
HAMILTON
MIDDLEFIELD
JEFFERSON
BRADFORD
MAIN
WALNUT
MARSHALL
ARGUELLO
EL CAMINO
Caltrain Parking Lot
Perry Lot
PERRY
BROADWAY
Court-House Square
Marshall Garage
SPRING
BROADWAY
Caltrain Station
Fox Theatre
Century Theatres
Jefferson Garage (Underground)
Winslow Lot
Main Street Lot
HILTON
MAPLE
Middlefield Lot
Sequoia Station Shopping Center
City Hall
City Hall Lot
STAMBAUGH
MIDDLEFIELD
Library Lot B
Library
Library Lot A
LEGEND
Free every evening and all day Saturday and Sunday
(See signs at these facilities for details)
First 1.5 hours Free or
First 4 hours Free with a validation from Century Theatres
(See signs at these facilities for details)
25¢ per hour, Monday - Friday, 10am to 6pm
(FREE after 6:00pm and all day Saturday and Sunday)
25¢ per hour, Monday - Saturday, 10am to 6pm
(FREE after 6:00pm and all day Sunday)
50¢ per hour, Monday - Saturday, 10am to 6pm
(FREE after 6:00pm and all day Sunday)
(ALL RATES AND HOURS SUBJECT TO CHANGE)
Updated on 6/19/08

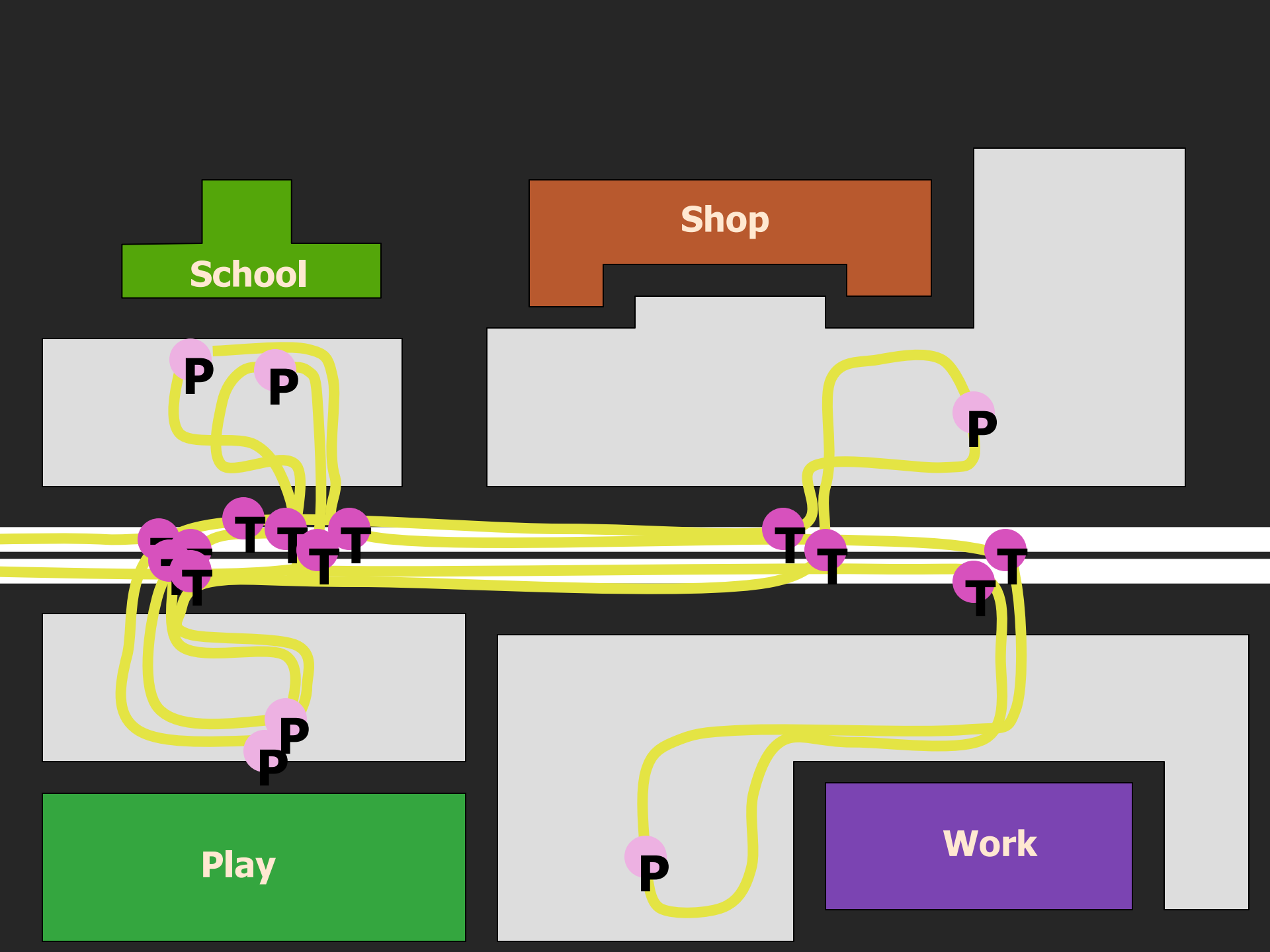
Right Time

Hours of Operation
Sunday - Thursday
11 AM to 8 PM
Friday - Saturday
11 AM to 12 midnight
Except Holidays

Invest Revenue

Unbundle and Share




School
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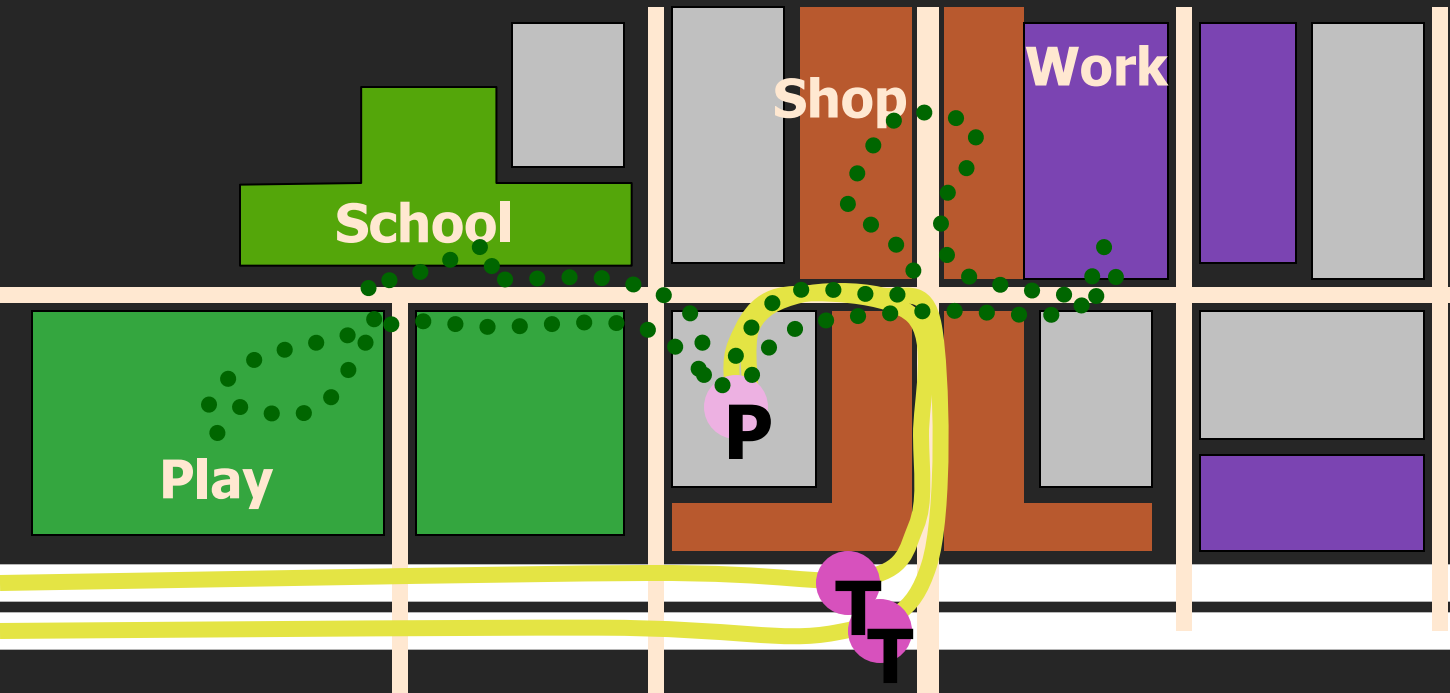
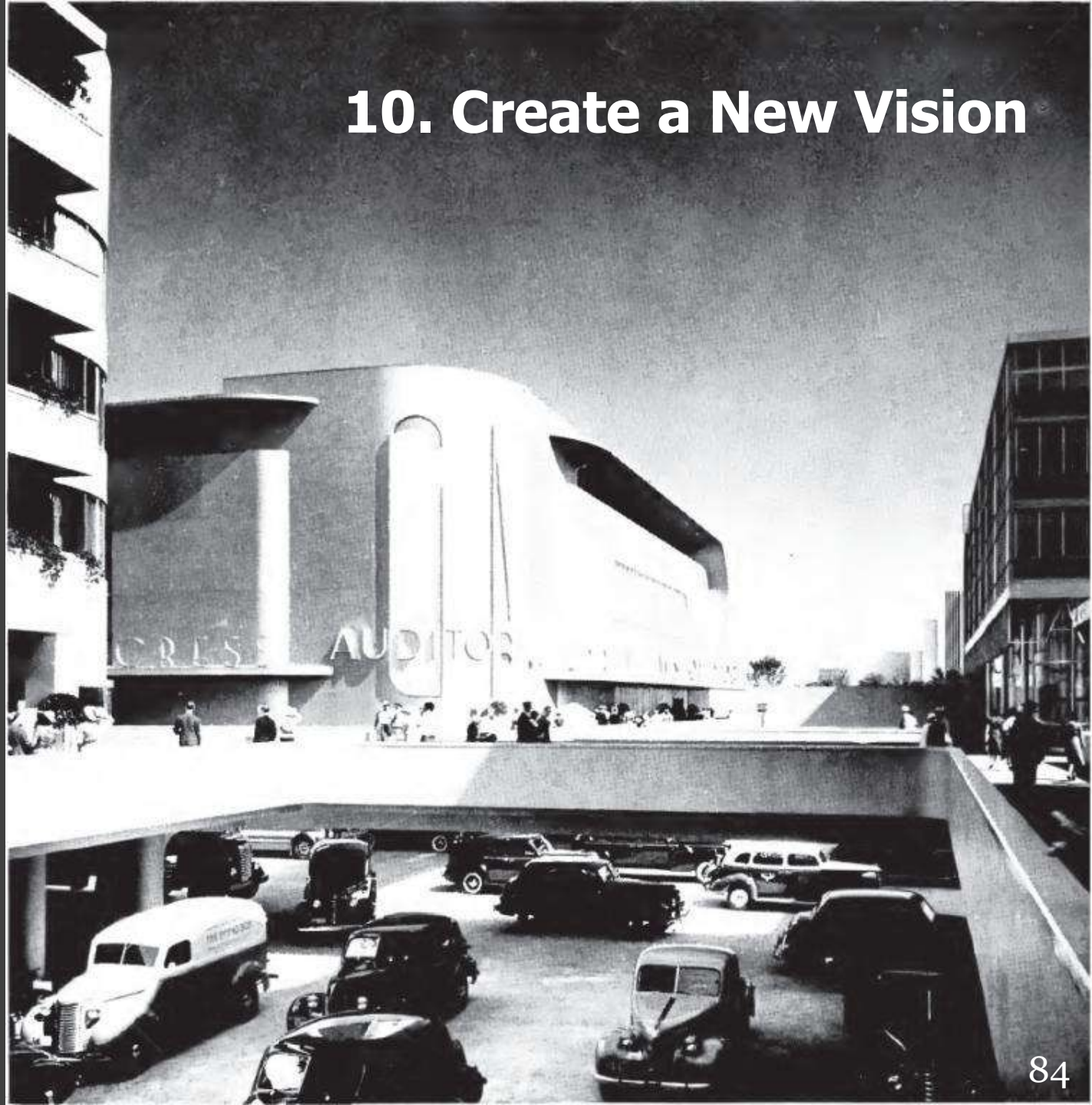
Mixed Use, Park Once District



Results:

- <½ the parking
- <½ the land area
- ¼ the arterial trips
- 1/6th the arterial turning movements
- <¼ the vehicle miles traveled

10. Create a New Vision



Somewhere West of Laramie

SOMEWHERE west of Laramie there's a bronco-busting, steer-roping girl who knows what I'm talking about.

She can tell what a sassy pony, that's a cross between greased lightning and the place where it hits, can do with eleven hundred pounds of steel and action when he's going high, wide and handsome.

The truth is—the Playboy was built for her.

Built for the lass whose face is brown with the sun when the day is done of revel and romp and race.

She loves the cross of the wild and the tame.

There's a savor of links about that car—of laughter and lilt and light—a hint of old loves—and saddle and quirt. It's a brawny thing—yet a graceful thing for the sweep o' the Avenue.

Step into the Playboy when the hour grows dull with things gone dead and stale.

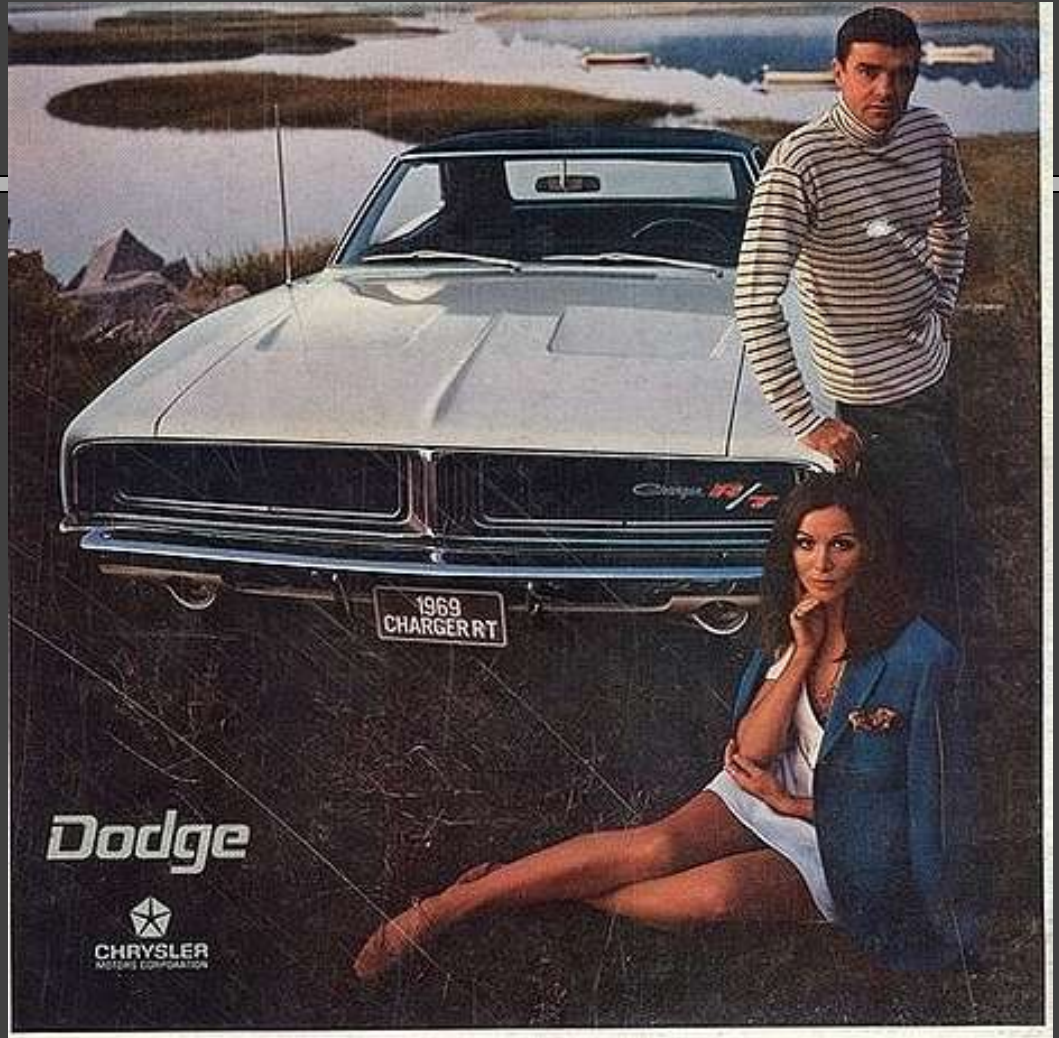
Then start for the land of real living with the spirit of the lass who rides, lean and rangy, into the red horizon of a Wyoming twilight.

JORDAN

JORDAN

JORDAN MOTOR CAR COMPANY, Inc., Cleveland, Ohio

1923, Saturday Evening Post



The Eternal Triangle.

You'd think Ralph's new love would have been curtains for me. I mean, it was all he talked about. Well, I learned to live with it. As it turned out, I think his new Charger R/T really brought us closer together. He's taught me how to shift the 4-speed synchromesh. He lets me pick out the stereo tapes. And clean the vinyl buckets. It's not all bad. He even mentioned marriage once.

DODGE fever
The Catch of The Year

rsepower. 100 mpg. Pure Sensuality.
PURE DRIVING PASSION
FISKER
FiskerAutomotive.com

Fisker

Mother Nature doesn't go out of her way to pamper a car. And neither do most car owners.

That's why Subaru builds and tests its cars to meet the demands of everyday driving situations.

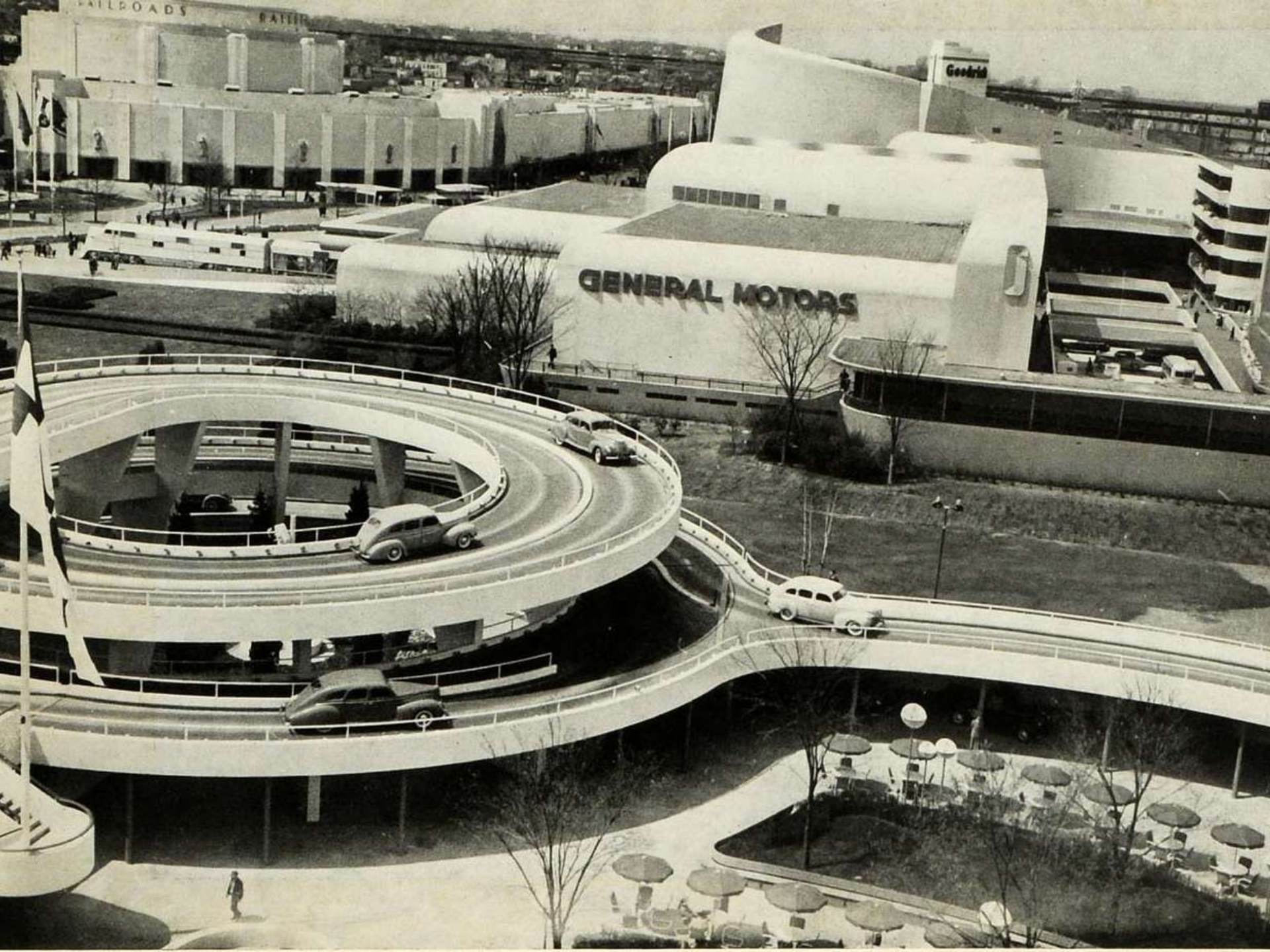
In fact, Subaru undergoes extensive road testing here, in America. On roads you drive on. And in weather conditions you drive in.

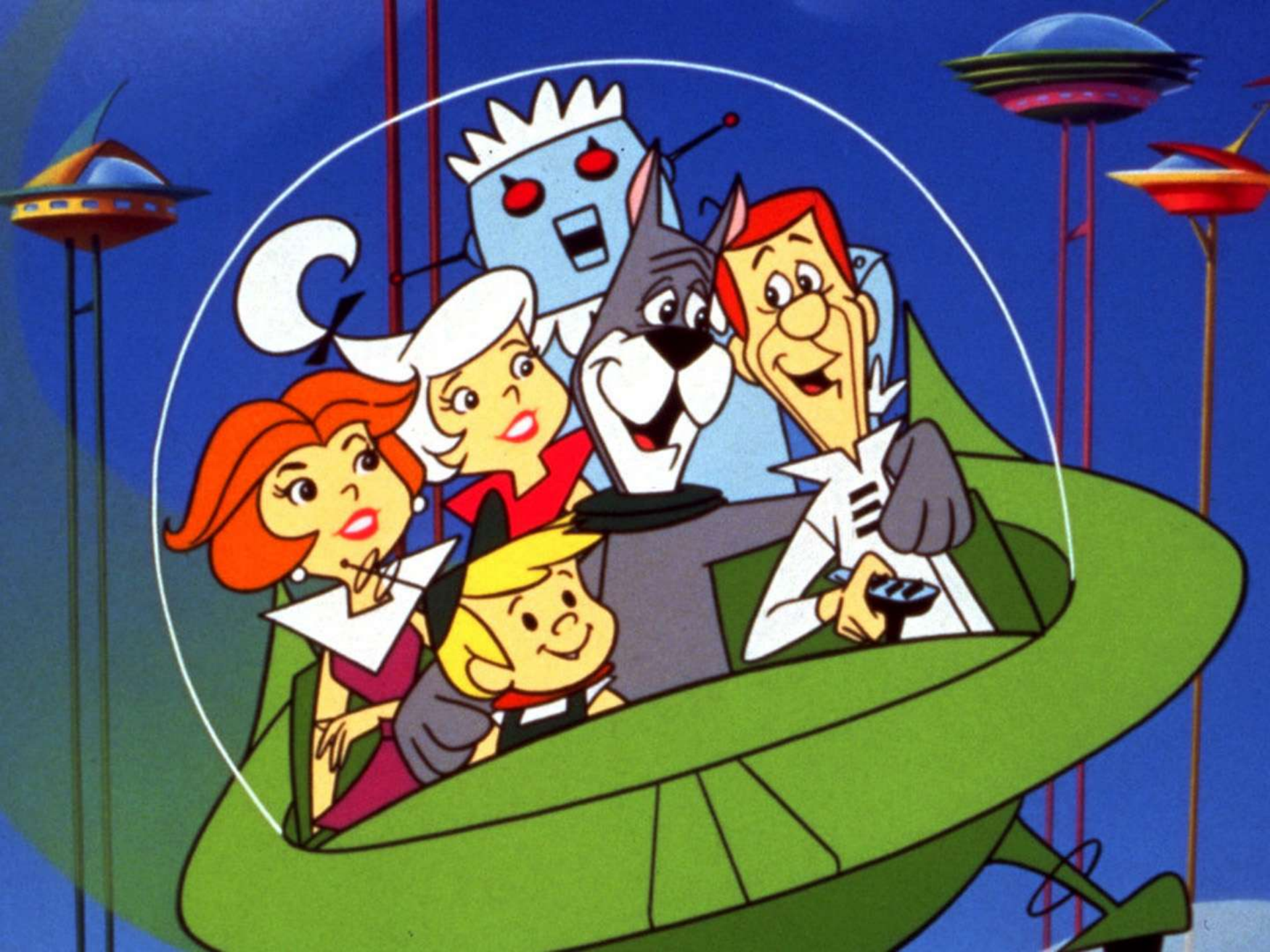
Maybe that's why, out of every Subaru registered since 1974, over 90% are still on the road.* And, why Subaru was voted #2 in customer satisfaction. Second only to Mercedes Benz.

So, almost any conditions you have to put your Subaru through, it's nice to know it's probably been there before.

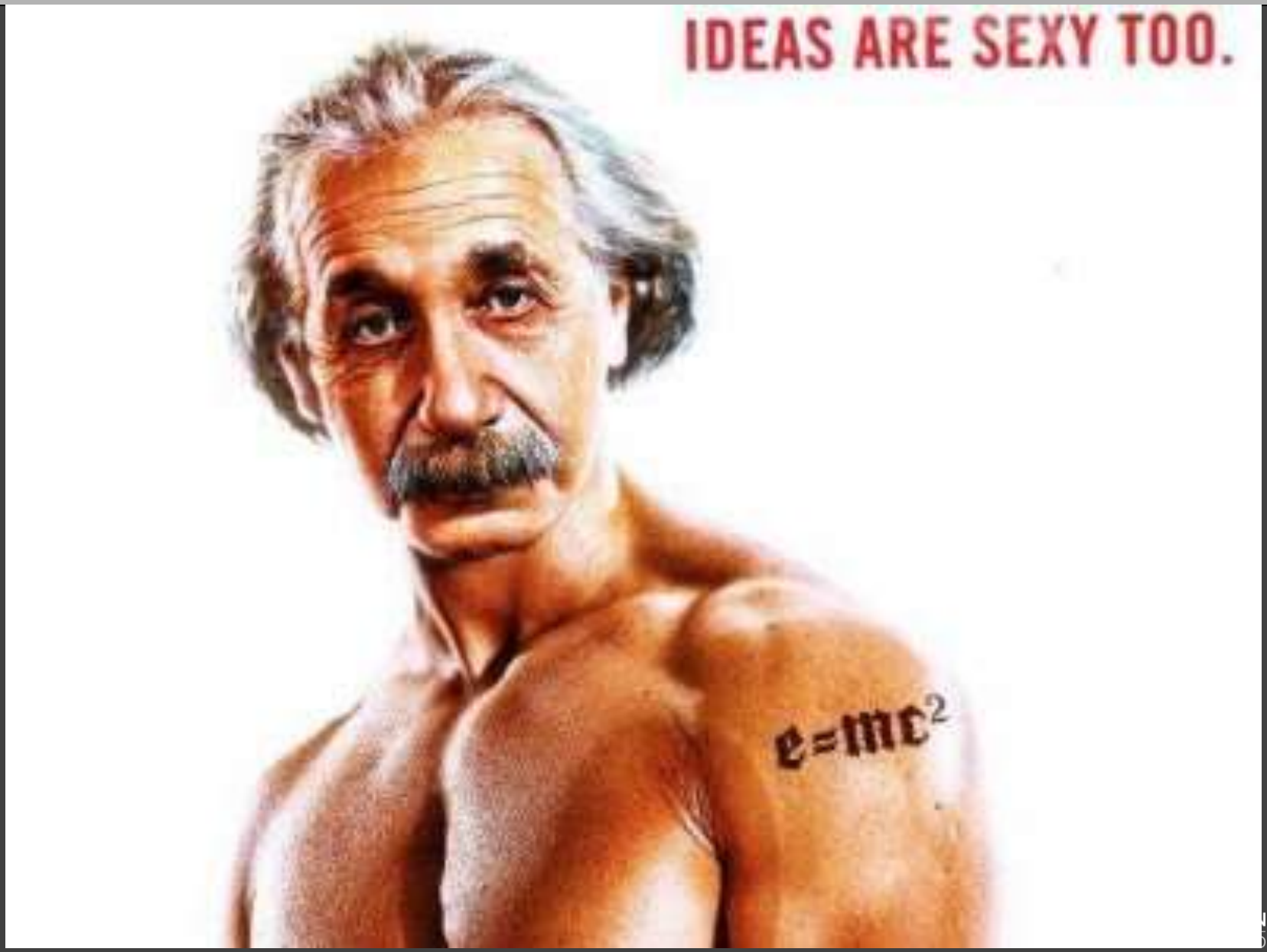
A CAR BUILT TO WITHSTAND MOTHER NATURE. AND HUMAN NATURE.

SUBARU.
Inexpensive. And built to stay that way.


GENERAL MOTORS
Goodrich



Toward a Better Vision?



For More Information

Jeffrey Tumlin

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Mobility Accessibility Sustainability

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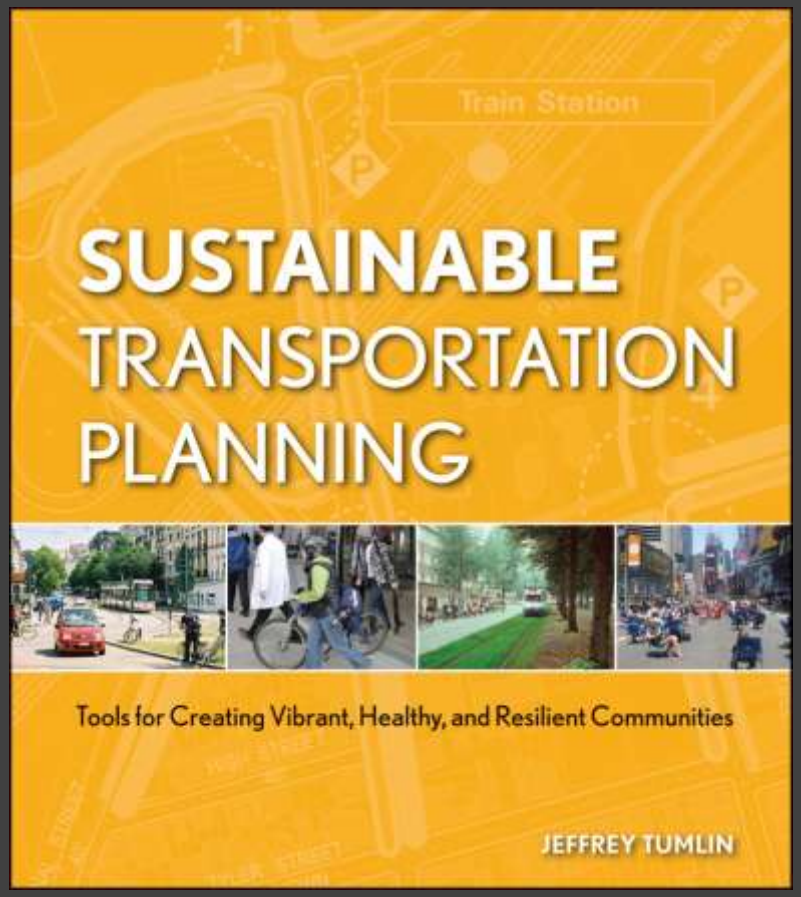
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