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Multimodal transportation for a joyful and equitable future in New Mexico

September 29, 2023



The mobility world is going through rapid changes



Autonomous



Air



Electric



Shared

But we have seen rapid change in the past...

**5TH AVE,
NEW YORK, 1900**



We can be better prepared this time around

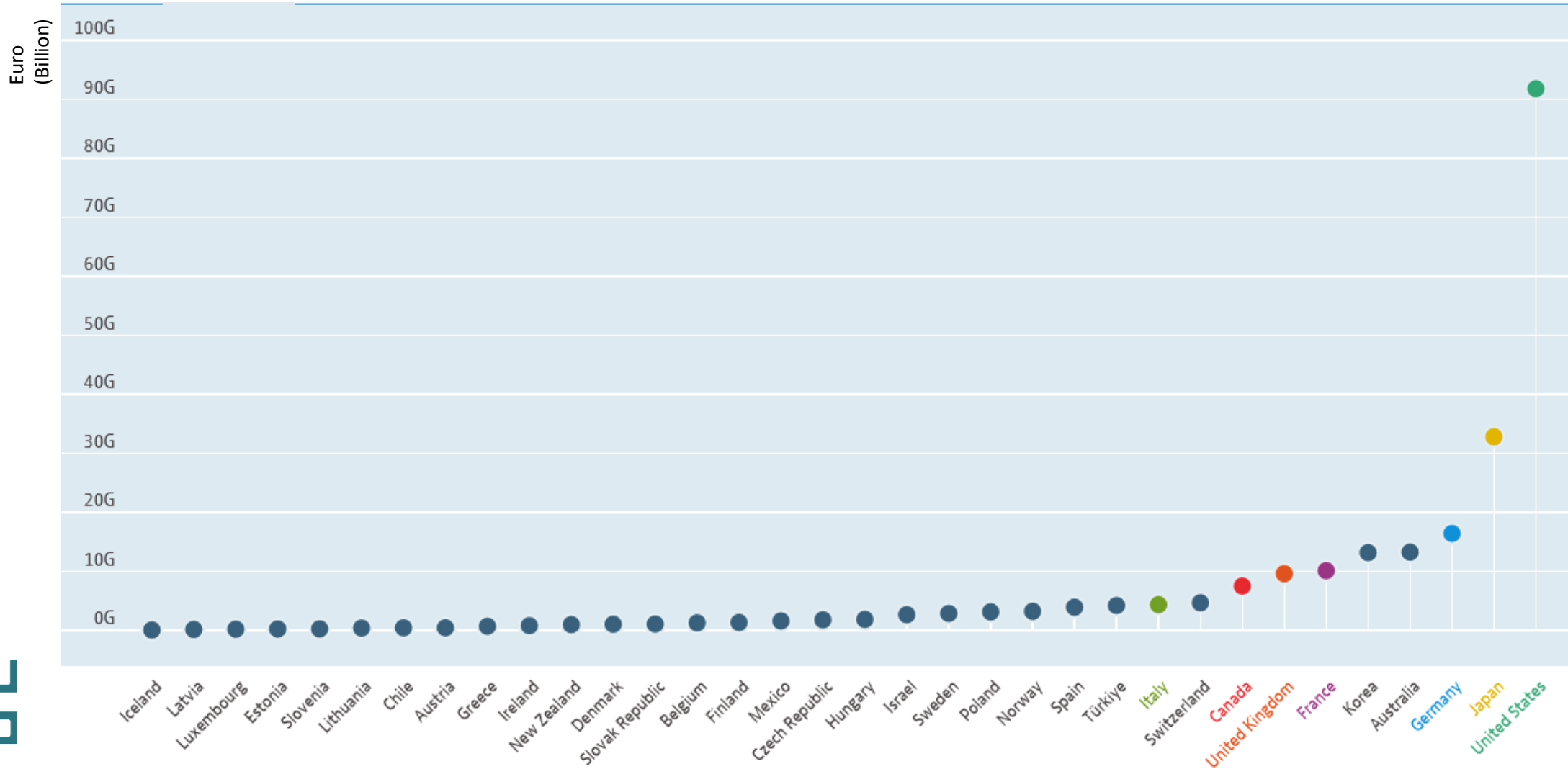
**5TH AVE,
NEW YORK, 1913**



Fueled by public investments, we have made driving the easy choice for people



The US spends more public money on highways and roads than all other developed countries



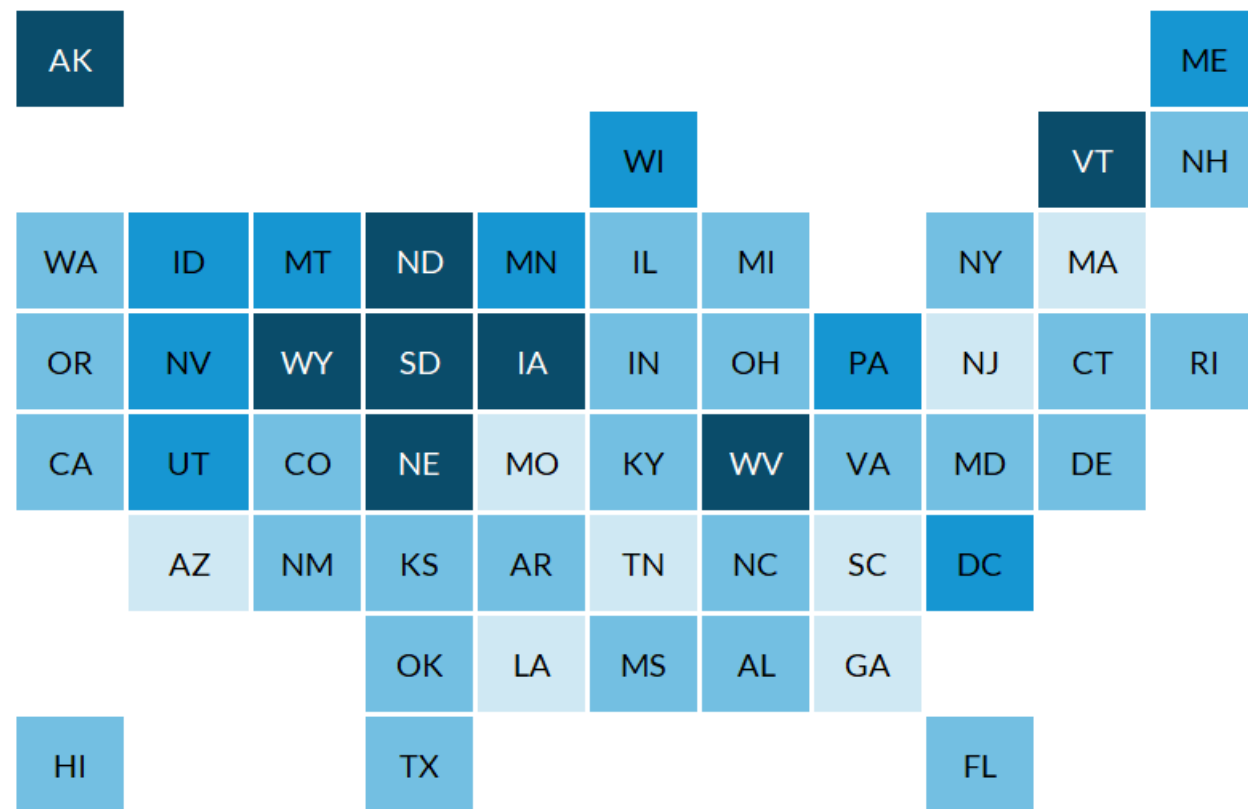
Per capita, road expenditures amount to the 5th largest rubric in direct government spending

State and Local Highway and Road Expenditures

Per capita direct general expenditures, fiscal year 2020

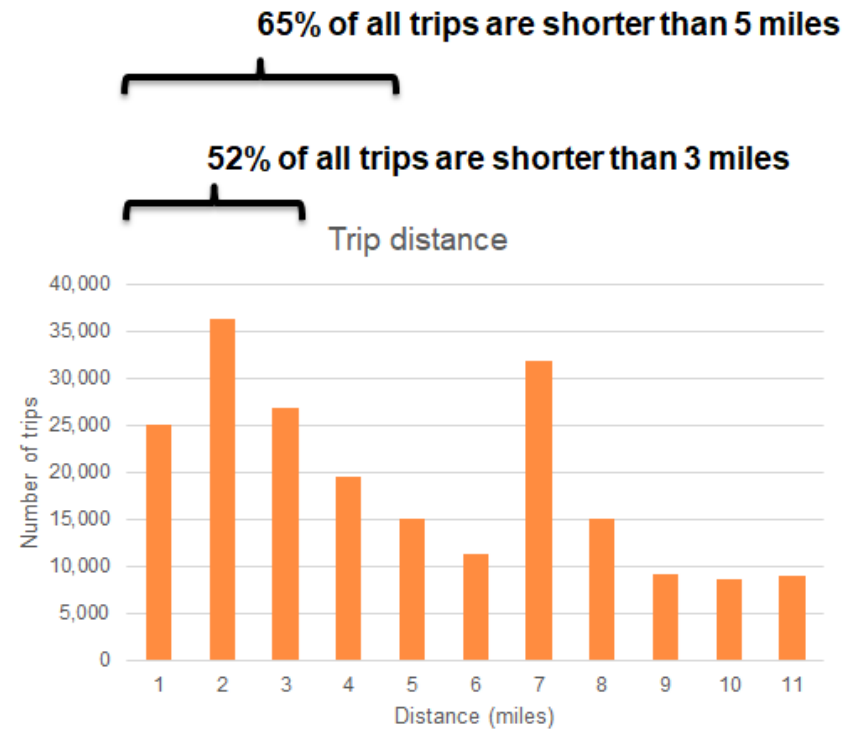
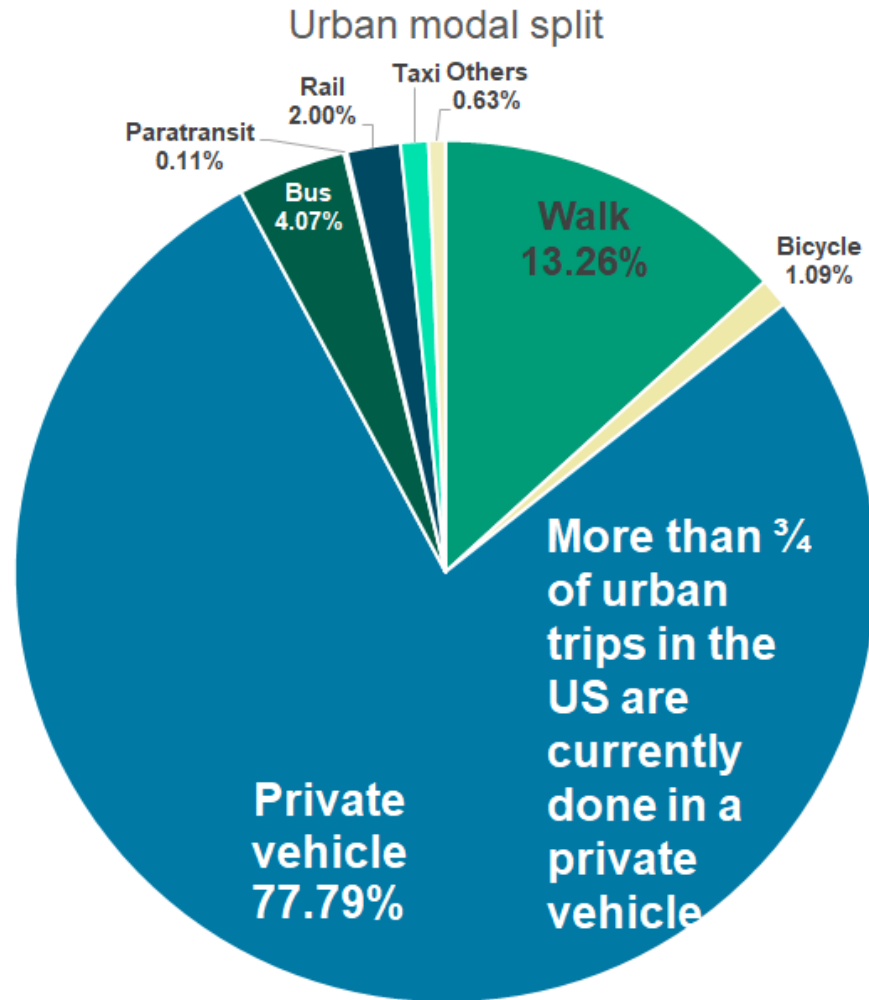


U.S. Total: \$616

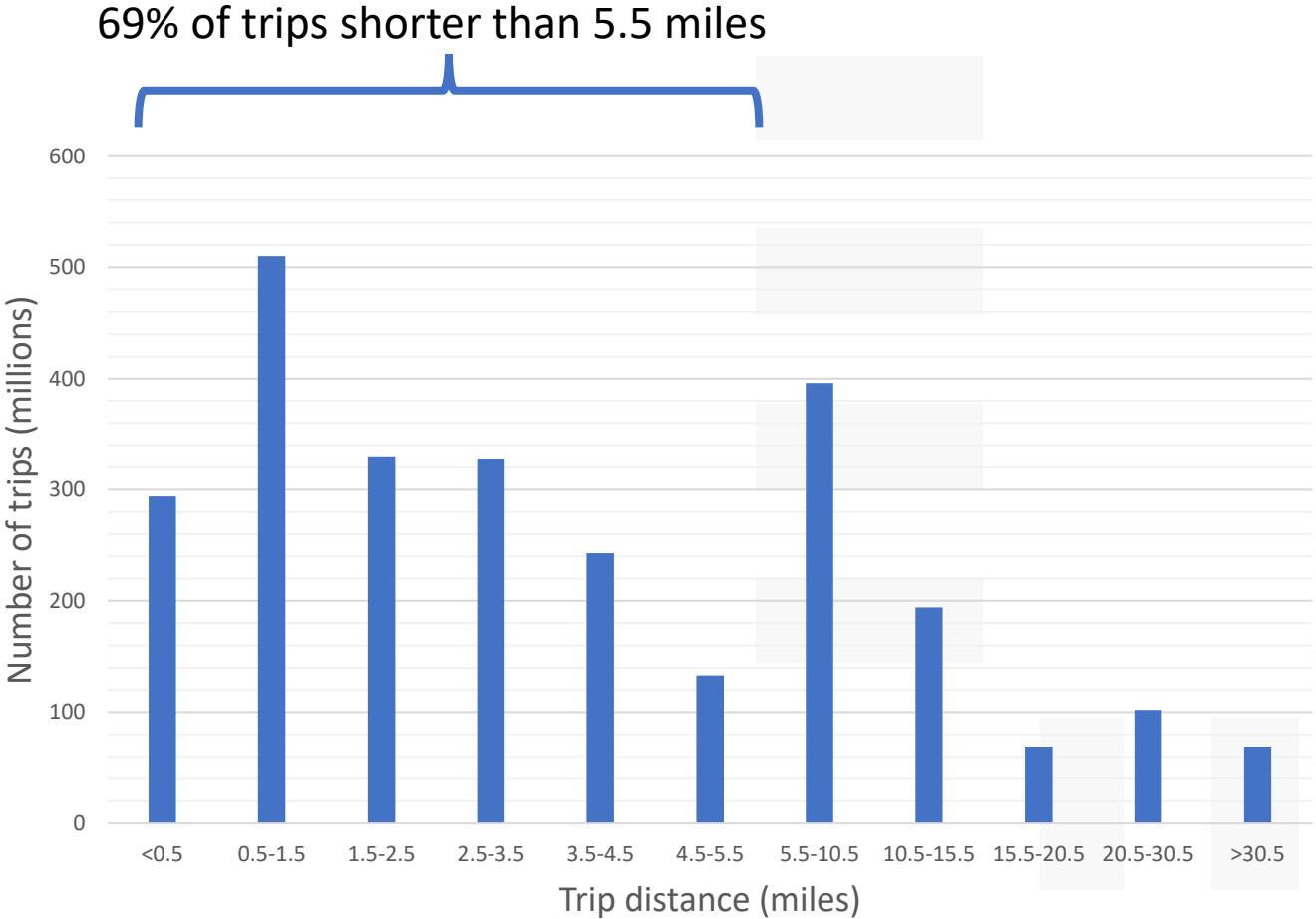


Source: US Census Bureau Annual Survey of State and Local Government Finances, 1977-2020 (compiled by the Urban Institute via State and Local Finance Data: Exploring the Census of Governments; accessed 06-Dec-2022 03:55), <https://state-local-finance-data.taxpolicycenter.org>.

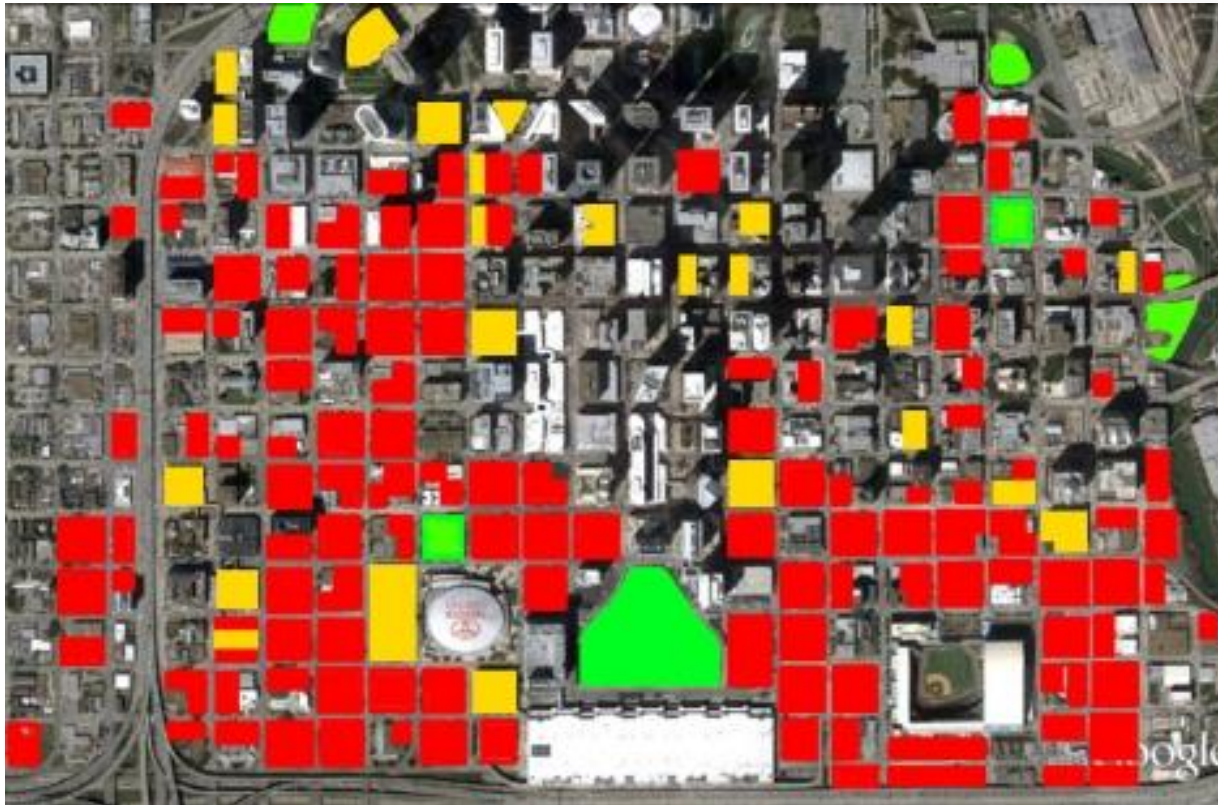
Our road expenditures have led to a self-fulfilling prophecy



For New Mexico, 69% of all trips are shorter than 5.5 miles



And to us dedicating a lot of our valuable urban land to cars

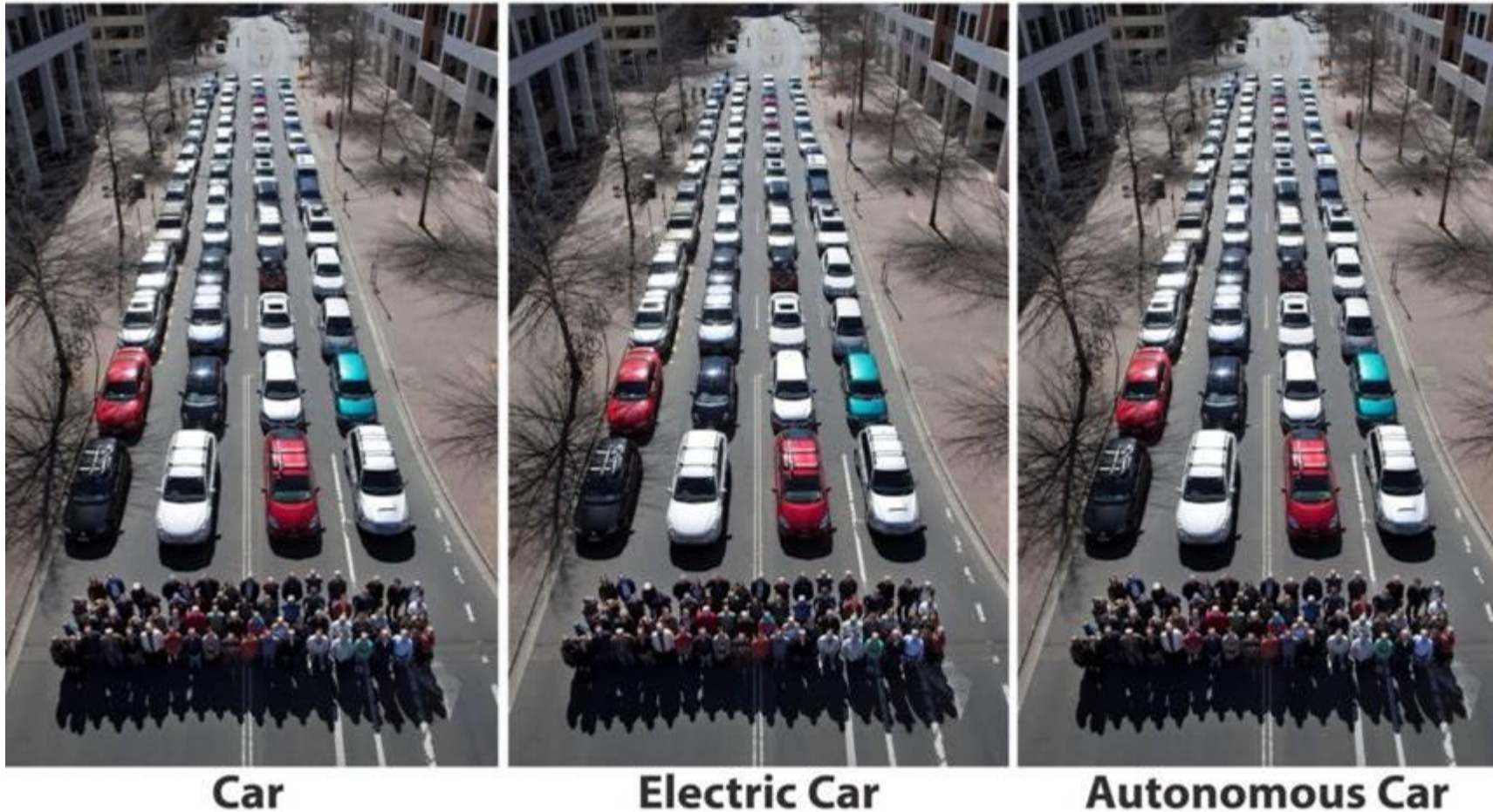


Houston, TX
Total area for
rights-of-way
plus off-street
parking: 64.7%

Park space: 2.6%

And the same problems that this growth has created in the past will not improve with technology.

Space Required to Transport 48 People



Even under the most ambitious projections, EV uptake will not lead to decarbonization in time. We need modal shift.

FIGURE 30 | Historical progress toward 2030 target for share of kilometers traveled by passenger cars



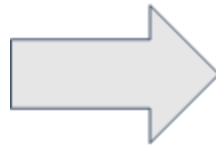
Notes: Due to data limitations, an acceleration factor is calculated for this indicator using methods from Boehm et al. (2021).

Sources: Historical data from ITF (2021); 2030 target derived from authors' analysis; calculations for projections based on BNEF (2021b), accessed with permission from Bloomberg New Energy Finance.

We need to shift the rationale that drives our transportation investments

What drives decisions today:

- Speed
- Congestion



What should drive decisions:
Access for people



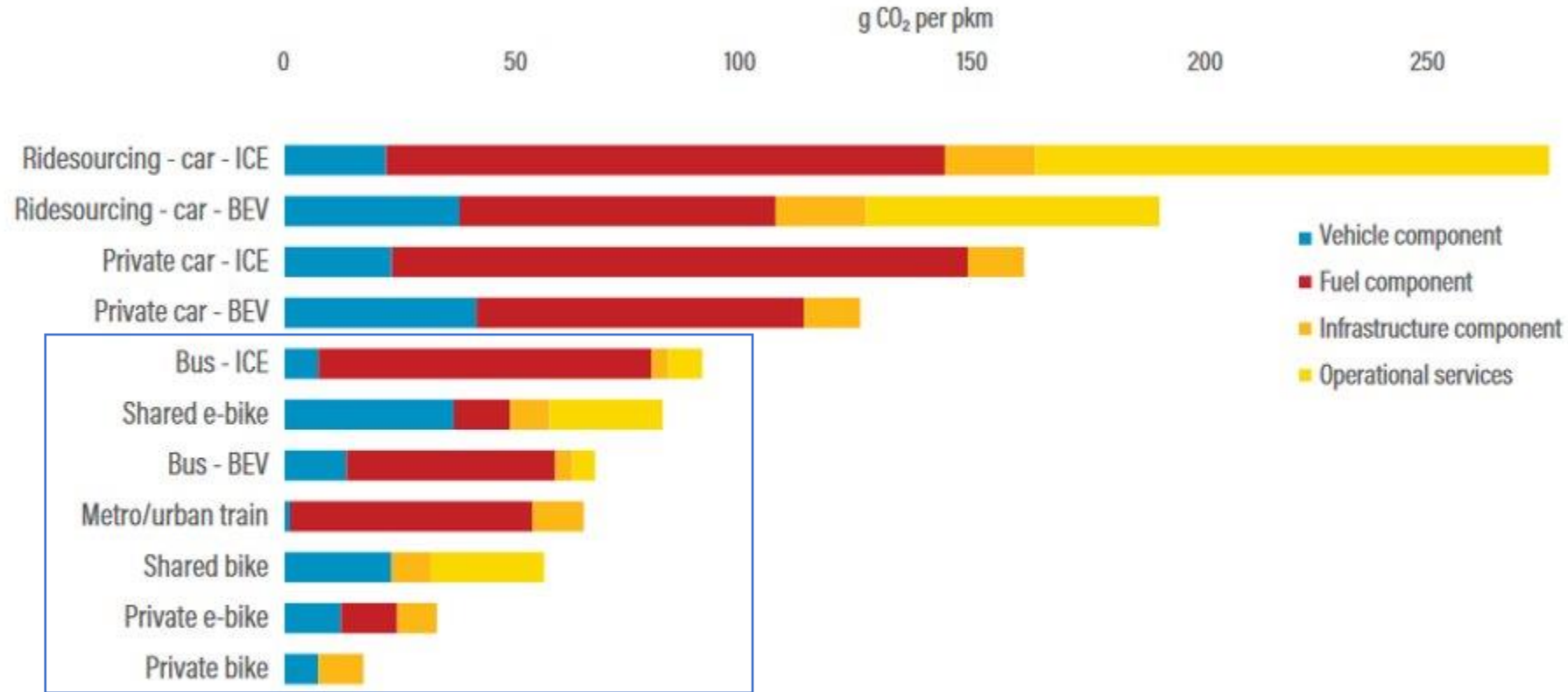
But we cannot do this if we continue to make more sustainable choices hard and expensive



“schedule flexibility, cost, safety and a short wait in traffic are prime factors associated with potential shifting [from SOVs]” (Tischer and Dobson, 1979).

Why we need a bundle of other transportation services (multimodal transportation)

Cars are very inefficient



Note: GHG = greenhouse gas; g CO₂ = grams of carbon dioxide; e-bike = electric bike; ICE = internal combustion engine; BEV = battery electric vehicle.

Source: ITF (2020b).

And they create additional costs which are borne by society (externalities)

95%

of the time, cars are parked

Source: RAC foundation, 2012

#1

globally, traffic crashes are the **number one killer** of people between 5-29 years

Source: World Health Organization, 2017

32%

Of household income for the lowest income quintile is spent on transportation in the US

Source: Bureau of Labor Statistics, 2022

New Mexico hasn't been immune to these issues

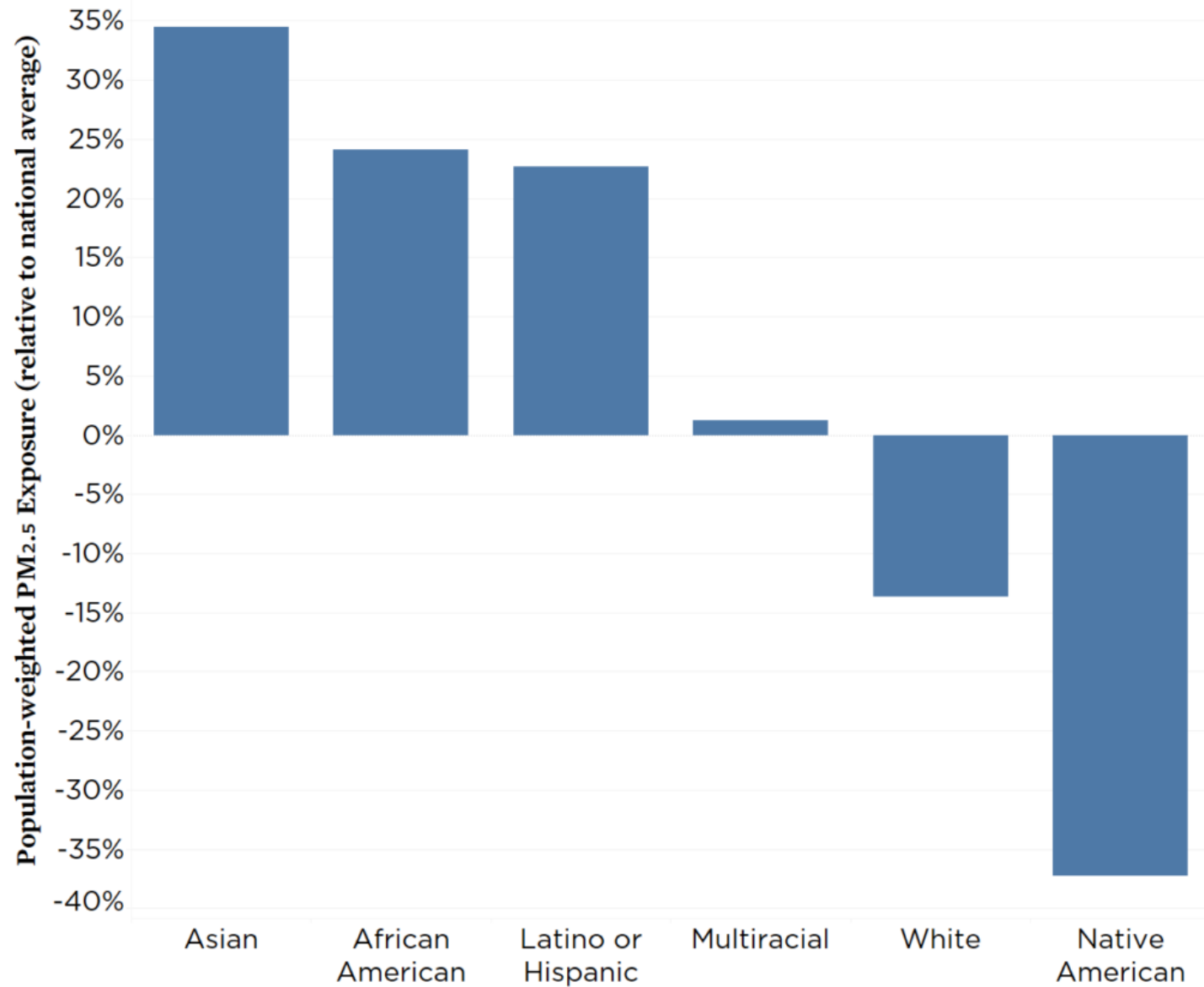
3.75

Pedestrian deaths per
100,000 population
(#1 in the country)

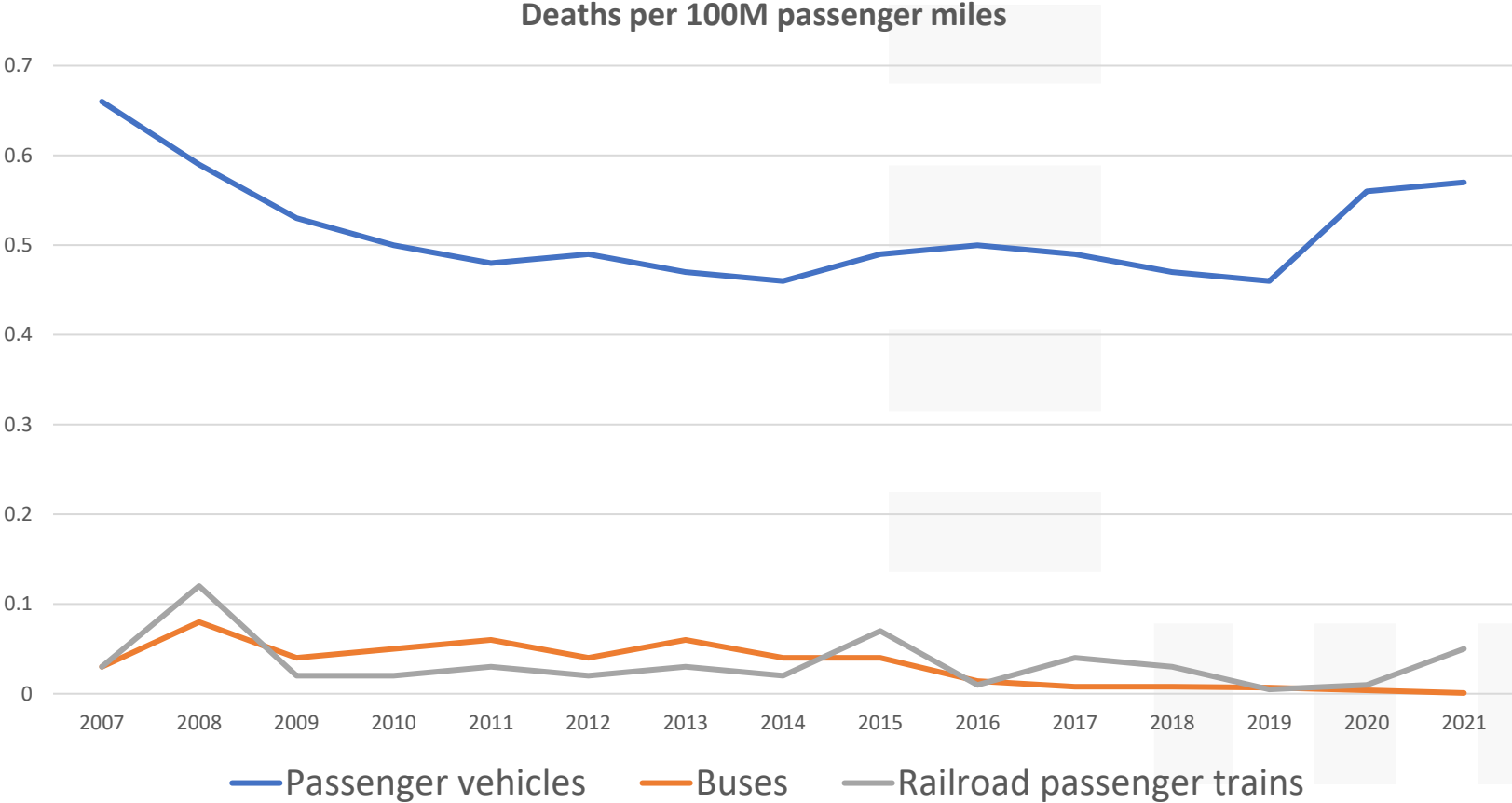
1.68

Fatalities per 100M miles
traveled
(#7 in the country)

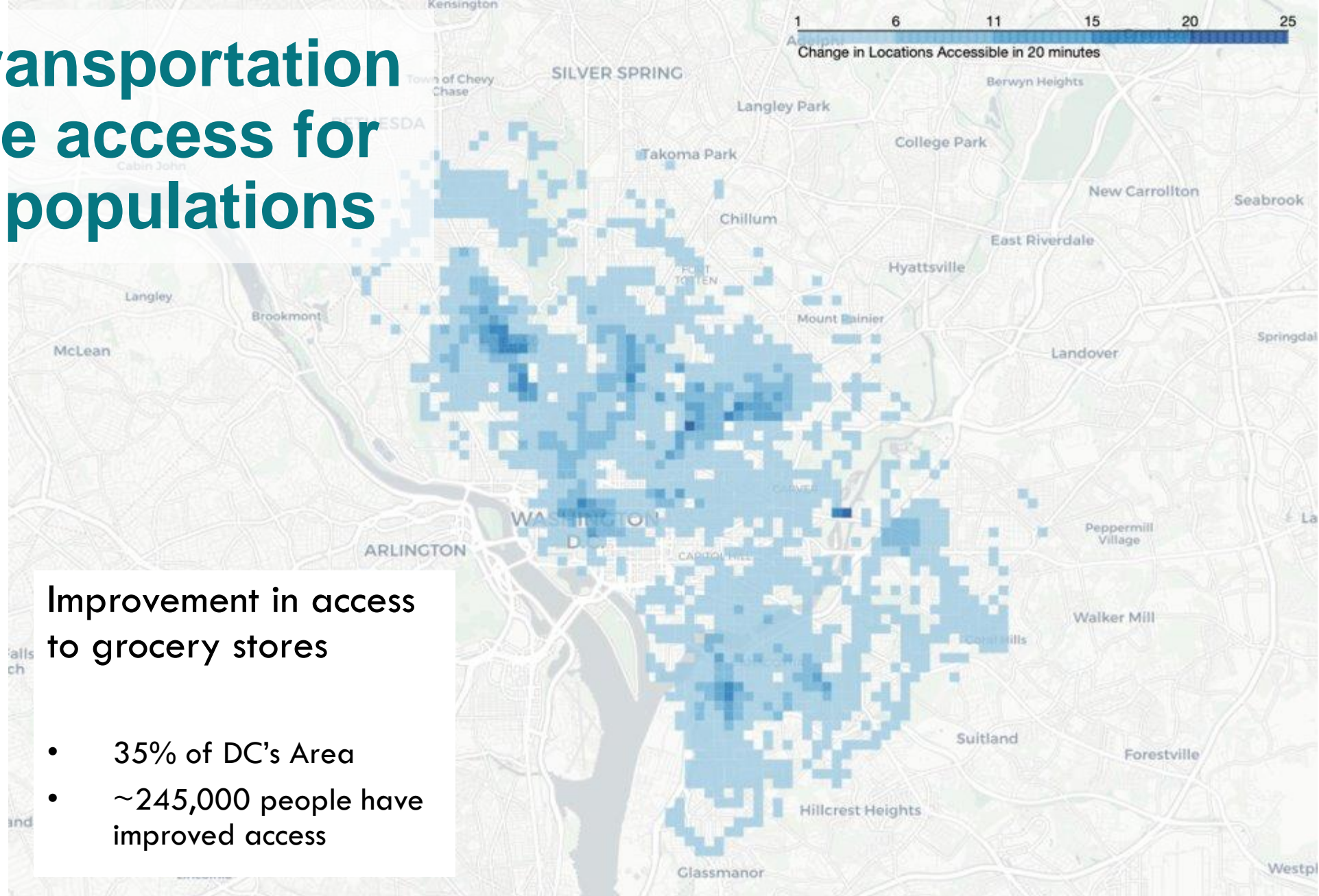
Ambient air pollution kills 3.4 million people every year, but the burden is not shared equally



In the U.S. public transportation has one-tenth the traffic casualty rate as automobile travel



Multimodal transportation helps improve access for underserved populations



Thinking about people first, not cars first

How can we make other transportation options as easy and convenient as cars?

1. Make life possible without owning a car

Mixed-used, higher density developments, that make it easy for people to reach their destinations without a car (especially around transit)

2. Make car alternatives easier and convenient



Almost 100 cities, including Kansas City have made all public transportation free

Safe bike lanes and sidewalks can help people make better travel choices





And we can make our transportation safer by design

Humans make mistakes, we should not shift the responsibility of no-harm to drivers.

Design is more effective than enforcement.

3. Fair and equitable fees for all modes (recognize externalities)

London's congestion charge generated almost \$303 million in gross revenue in 2019, which is being reinvested back into the city's public transport system.



Reclaim some of the space we have given away to cars




**Lower speed
limits!**

20



is Plenty

VISION ZERO



**If road spending is a must, fix what we have.
Don't build new urban highways.**

During the 2008 Great Recession,
U.S. investments in road repair
created 16% more jobs than
new road construction

Infrastructure is destiny!

NU
MO

Sebastian Castellanos
scastellanos@wri.org



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State Policy Opportunities in Multimodal Transportation

September 29, 2023

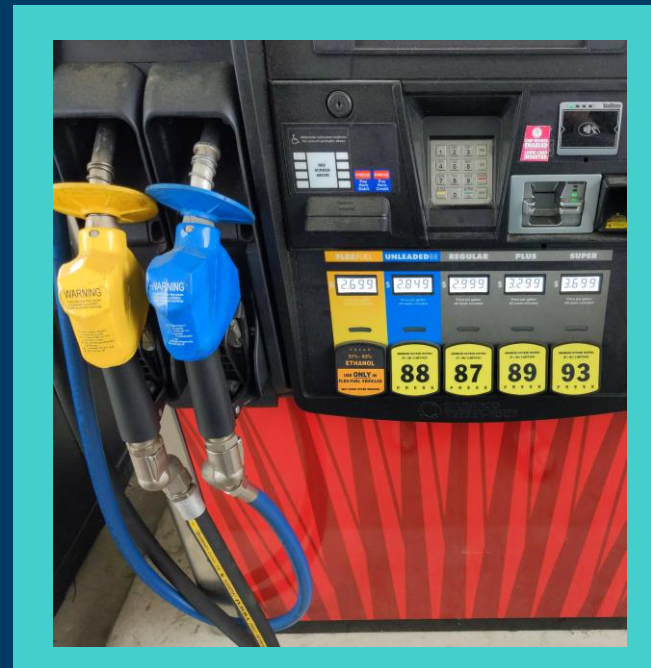
Miguel Moravec, Senior Associate

Multi-modal transportation policies can address many New Mexico constituent priorities:



Safety

New Mexico is #1 State for Pedestrian Fatalities
– NHTSA



Cost Savings

Car ownership at all time high \$12,000 annual
– NYTimes



Climate

2/3 New Mexico voters support polices to reduce climate pollution – EDF

There are many, many tools state decision makers can use to unlock the benefits of multimodal transportation

Smart growth	Urban infill development	Missing middle housing	Eliminating barriers to development	Minimum lot sizes	Floor to Area ratios
Compatibility standards	Eliminate minimum parking requirements	Transit-oriented development / transit-supportive communities	Commercial rebalancing	Bringing critical resources like food, healthcare, recreation closer to residential areas	Congestion pricing
Mileage-based user fees	Dynamic parking pricing that reflects demand	Highway infrastructure	Eliminating unnecessary highway expansions	Highway removal (highway capping, conversion to urban boulevards, land redevelopment)	Street redesign / complete streets
Reallocating street space for non-car users	Accommodating space for EV charging infrastructure	Pedestrianization	Protected lanes for bikes and micro-mobility services	Tree canopy and shading	Transportation Demand Management
City- and employer-driven mobility alternatives	Transit Redesign	Redesigning transit systems to serve the transit-dependent and non-commute trips instead of peak commuter trips	New Mobility	Advancing shared, electric, autonomous mobility	Incorporating universal payment and trip planning systems to bring together publicly and privately owned modes

Multimodal Transportation State Policy Strategy



Shift investments to expand transportation options



Plan for smart growth in housing & land use



Incentivize more and better mobility options

Multimodal Transportation State Policy Strategy



Shift investments to expand transportation options

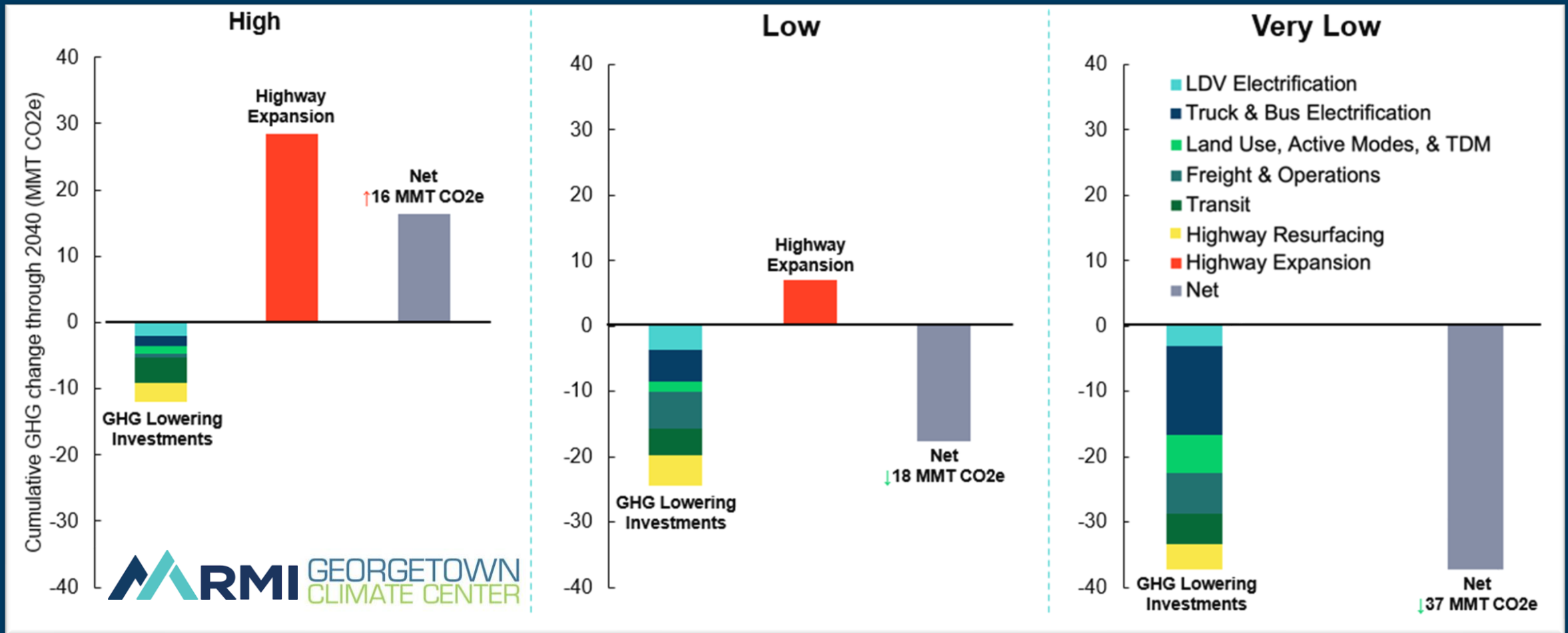


Plan for smart growth in housing & land use

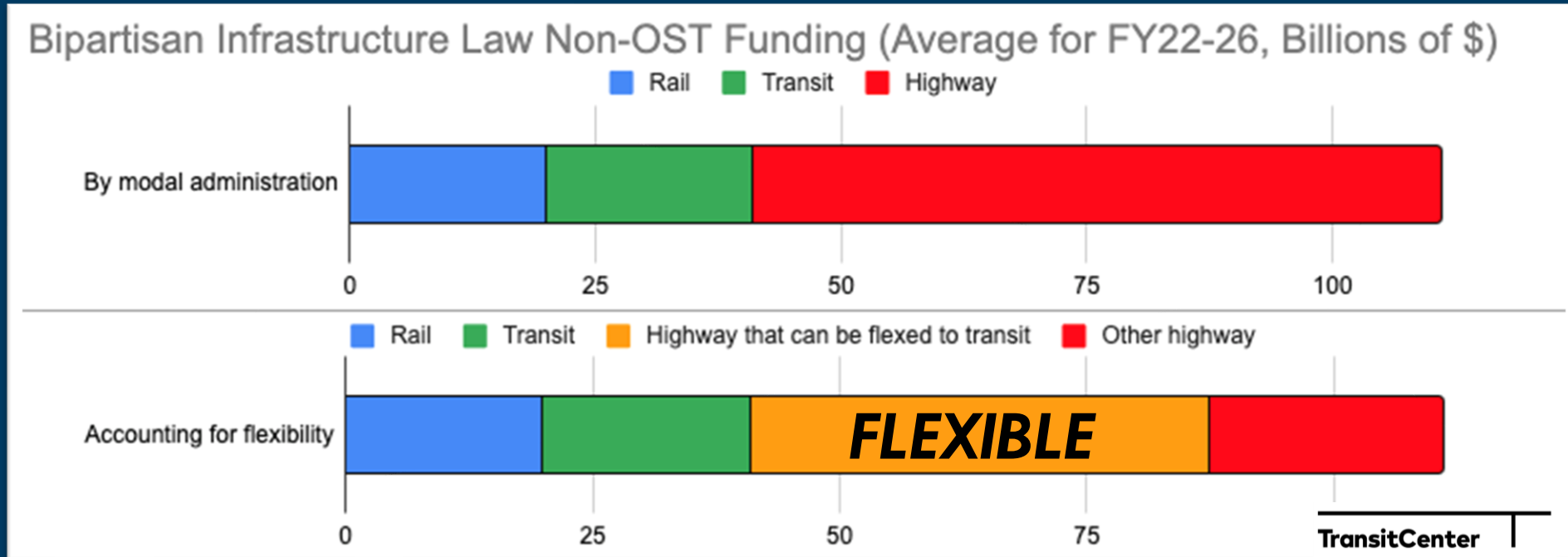


Incentivize more and better mobility options

EV's alone won't hit climate targets – IIJA dollars must be spent on suite of strategies, including multi-modal transport, to limit pollution



Did you know: most IIJA dollars can be 'flexed' to multimodal projects



Funding can be flexed from large FHWA programs including NHPP, ATBG, CMAQ, and CPR to transit projects

States who flex: Illinois, New York, Maryland



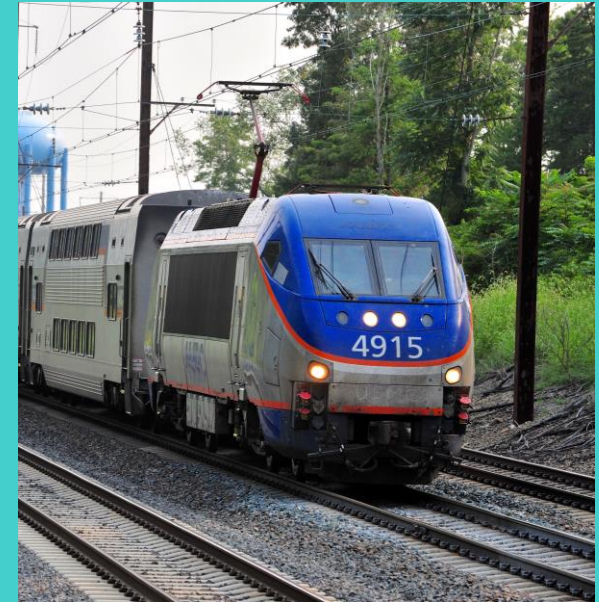
IL flexed \$300 million

so that the Chicago Transit Agency could improve two **downtown rail stations** and make a third station accessible to people with disabilities



NY flexed \$14 million

to pay for transit projects like **bus rapid transit** near Albany, new buses near Niagara Falls, and expanded transit service in Syracuse



MD may flex \$400 million

to meet a legislative mandate to expand MARC commuter rail + maintain and repair transit systems

Colorado SB 21-260: Passed law requiring CDOT to shift investments to meet new climate targets



COLORADO
Official State Web Portal

Colorado approves nation-leading rule to cut greenhouse gas emissions by shifting how it plans the state's transportation system

Bipartisan!



Colorado SB 21-260: CDOT shifted \$1.5 billion into 5 new BRT corridors + multimodal networks

Compliance Category	GHG Mitigation Strategies	Estimated 2030 GHG reduction (metric tons)	Share of GHG target
Updated 2050 transportation plan, modified projects, and revised model assumptions – 80% of 2030 Target	<ul style="list-style-type: none"> - Less highway widening (I-25 Central, C-470, etc), - Complete 5 Bus Rapid Transit (BRT) corridors, - Add \$900 million in multimodal (transit, bike, ped), - Updated telework model assumption to 25%, - Updated land use model assumption (more infill development than anticipated in 2019) 	680,000	79.4%
Additional Programmatic Investment ("off-model" strategies) – 9% of 2030 Target	Additional signal timing	50,000	5.8%
	Increased Bustang service within DRCOG area	3,000	0.4%
	Pedestrian Facilities, Complete Streets retrofits	20,000	2.3%
Mitigation Action Plan (voluntary land use and parking management strategies) – 11% of 2030 Target	Increase residential density	13,548	1.6%
	Increase job density	2,309	0.3%
	Mixed-use TOD (high intensity)	8,588	1.0%
	Mixed-use TOD (moderate intensity)	18,397	2.1%
	Reduce or eliminate parking requirements and set low maximum levels (residential)	37,750	4.4%
	Reduce or eliminate parking requirements and set moderate maximum levels (residential)	18,332	2.1%
	Reduce or eliminate parking requirements and set maximum levels (commercial)	4,373	0.5%
	Adopt local Complete Streets standards	369	0%
Total		856,666	100%

Achieved by repurposing funds from two large Denver highway expansion projects

Colorado SB 21-260: New target framework will generate \$40 B of net benefit for Coloradans

The Benefits of CDOT's GHG Planning Standard: \$40 Billion by 2050

Vehicle Operating Costs



\$11 Billion Savings

Consumer savings from lower fuel & maintenance costs.

Safety (Crashes)



\$19 Billion Savings

Lower costs associated with traffic fatalities or injuries such as medical costs, insurance, vehicle property damage, lost workplace productivity.

Traffic Delay



\$9 Billion Savings

Decreased travel time for commuting, errands, personal travel & freight movement.

Air Pollution



\$270 Million Savings

Lower healthcare costs from less local air pollution.

Social Cost of Carbon



\$1.2 Billion Savings

Avoided financial losses and costs to pay for damages caused by climate change.

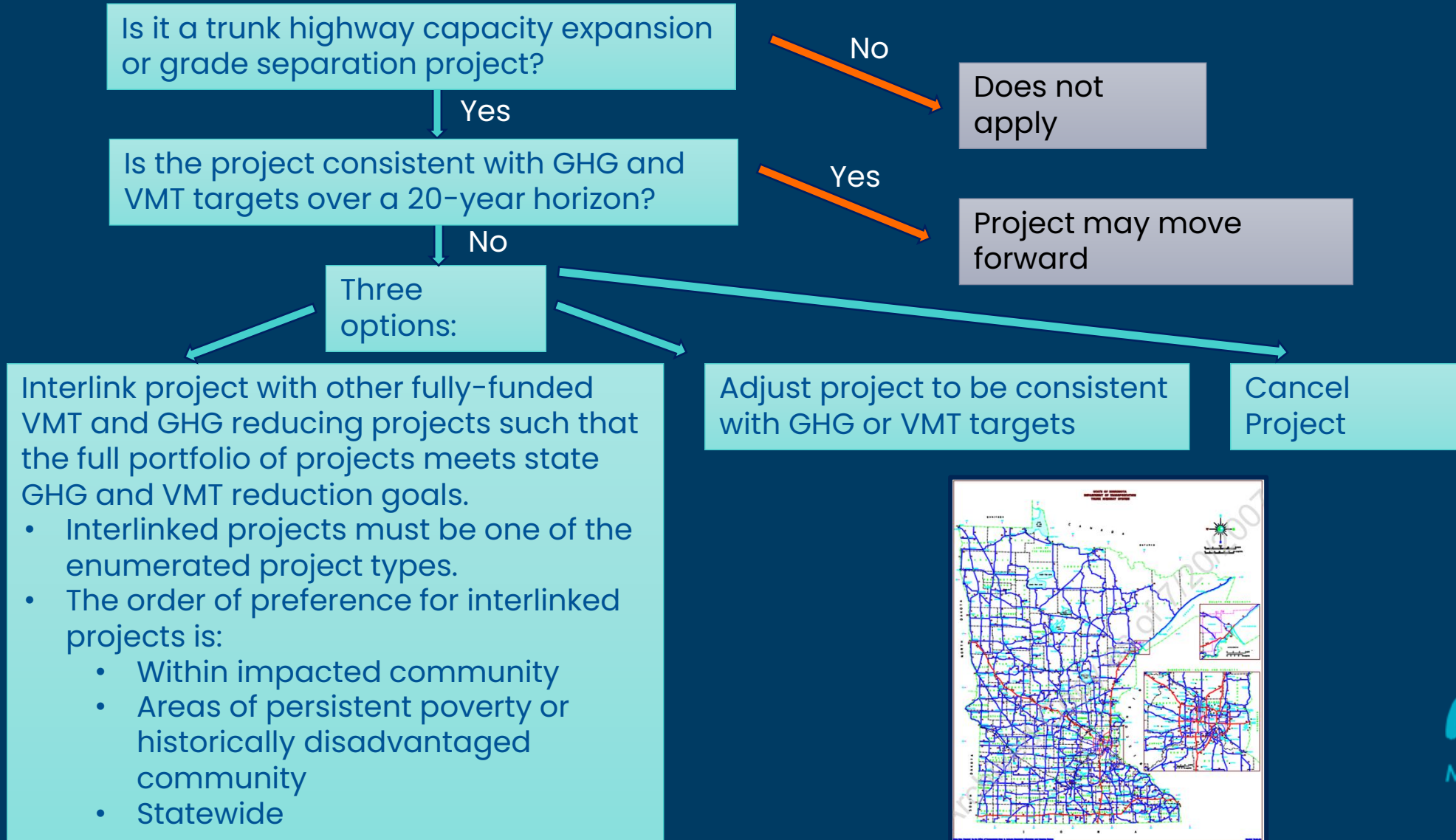
Physical Inactivity



\$618 Million Savings

Improved health from more physical activity such as walking and biking.

Minnesota HF 2887: Highway project funding to be shifted unless aligned w/ VMT & climate targets

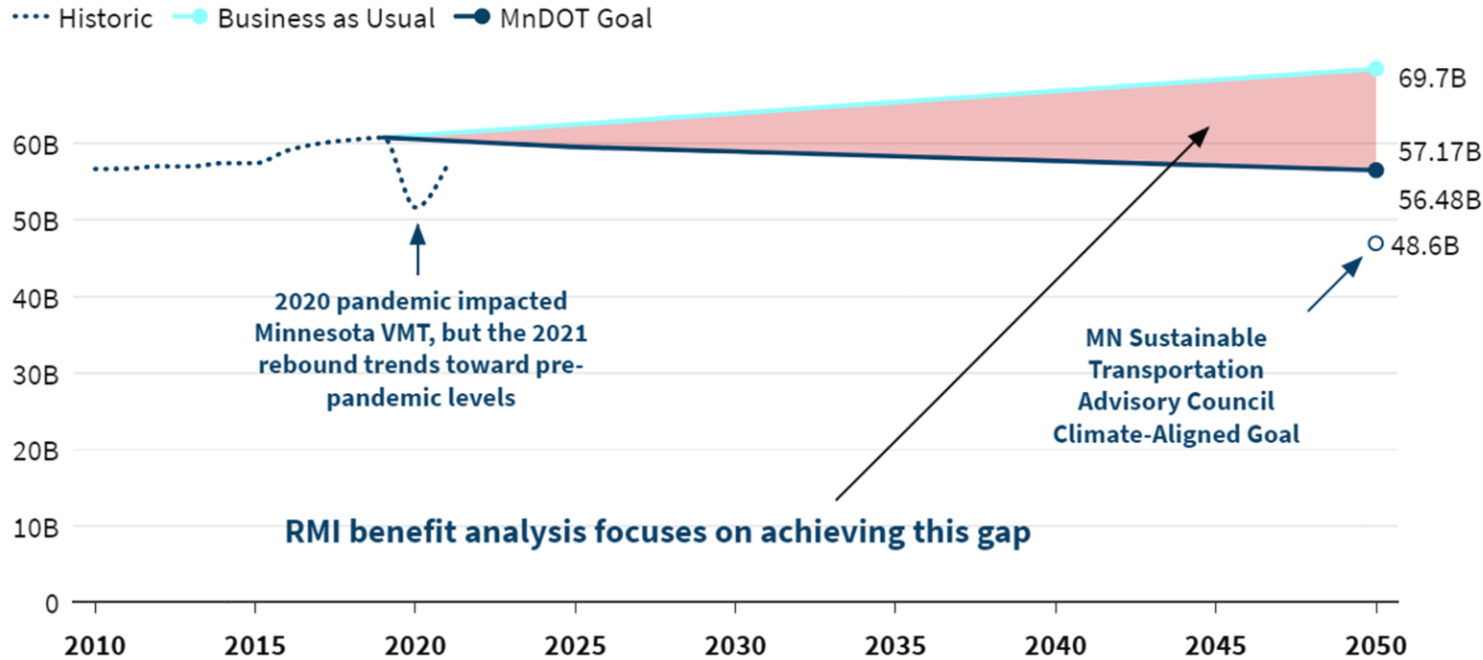


Minnesota HF 2887: VMT target expected to fund multimodal transport + generate \$91 B in benefit

Exhibit 2: MnDOT transportation goals versus business-as-usual projections

Vehicle Miles Travelled, Minnesota

MnDOT has a voluntary goal to reduce Vehicle Miles Travelled (VMT) by 20% per capita by 2050.

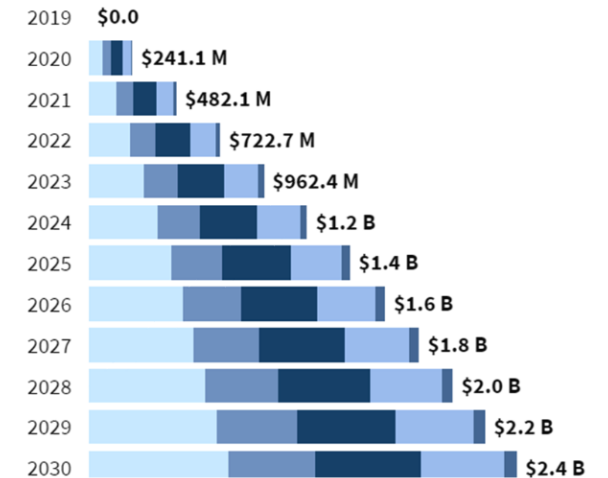


Analysis: Minnesotans would save up to \$91 billion from climate-smart transportation

Cost Savings from Climate-Smart Transportation

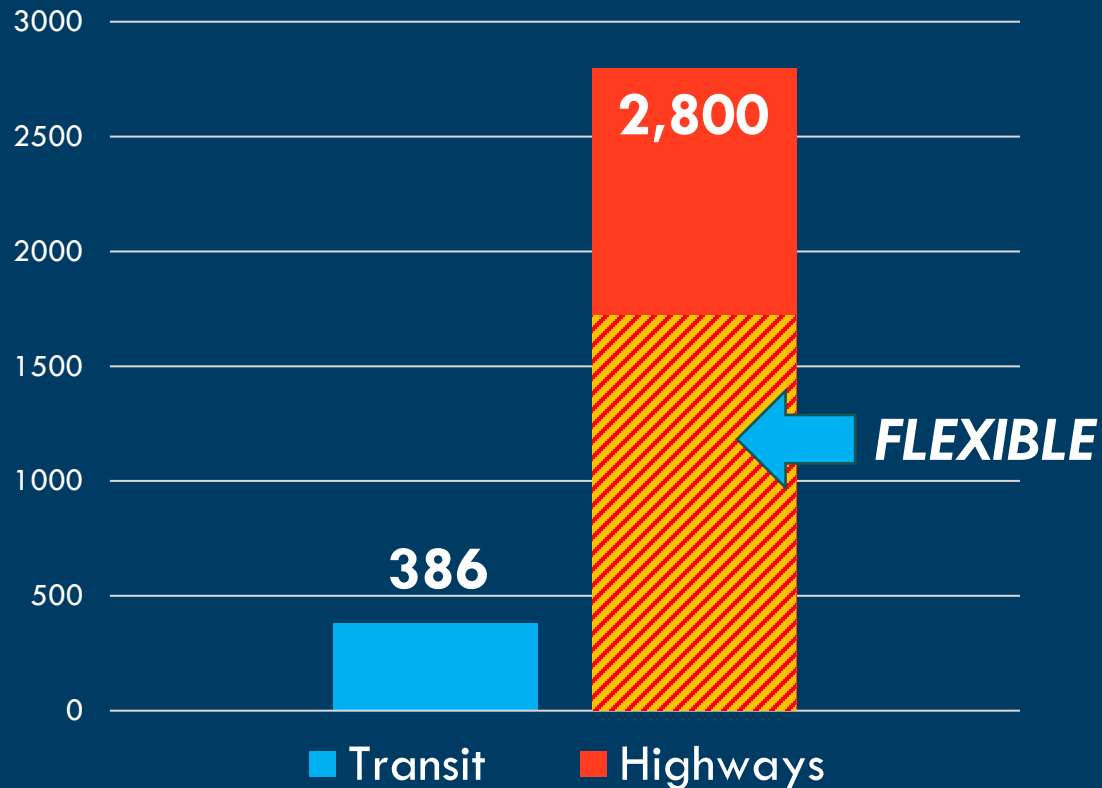
If MnDOT met its statewide VMT goal and expanded transportation options, the following savings:

■ Avoided Crash Fatality Costs
 ■ Avoided Crash Injury Costs
 ■ Avoided Maintenance Costs
 ■ Avoided Air Quality Fatality Costs



Take-away: New Mexico should consider policies to flex + shift dollars into multimodal transportation

New Mexico IIJA Formula Funding 2021-2026, \$ Billions



Model Policies:
Colorado SB 21-260
Minnesota HF 2887
Maryland HB 114
Louisiana SB 467
Maine LD 1559

Multimodal Transportation State Policy Strategy



Shift investments to expand transportation options



Plan for smart growth in housing & land use



Incentivize more and better mobility options

Smart Growth: You can pass policies that change land use and bring people closer to destinations.



Upzoning

Building residential density upon parcels that have been formerly zoned for less dense building types



Infill & Redevelopment

Developing vacant or redeveloping underutilized parcels into building types that offer a diversity of uses



Transit-Oriented Development

Redeveloping parcels near public transit stops, offering residents greater access and connectivity



What % is parking? Downtown Albuquerque

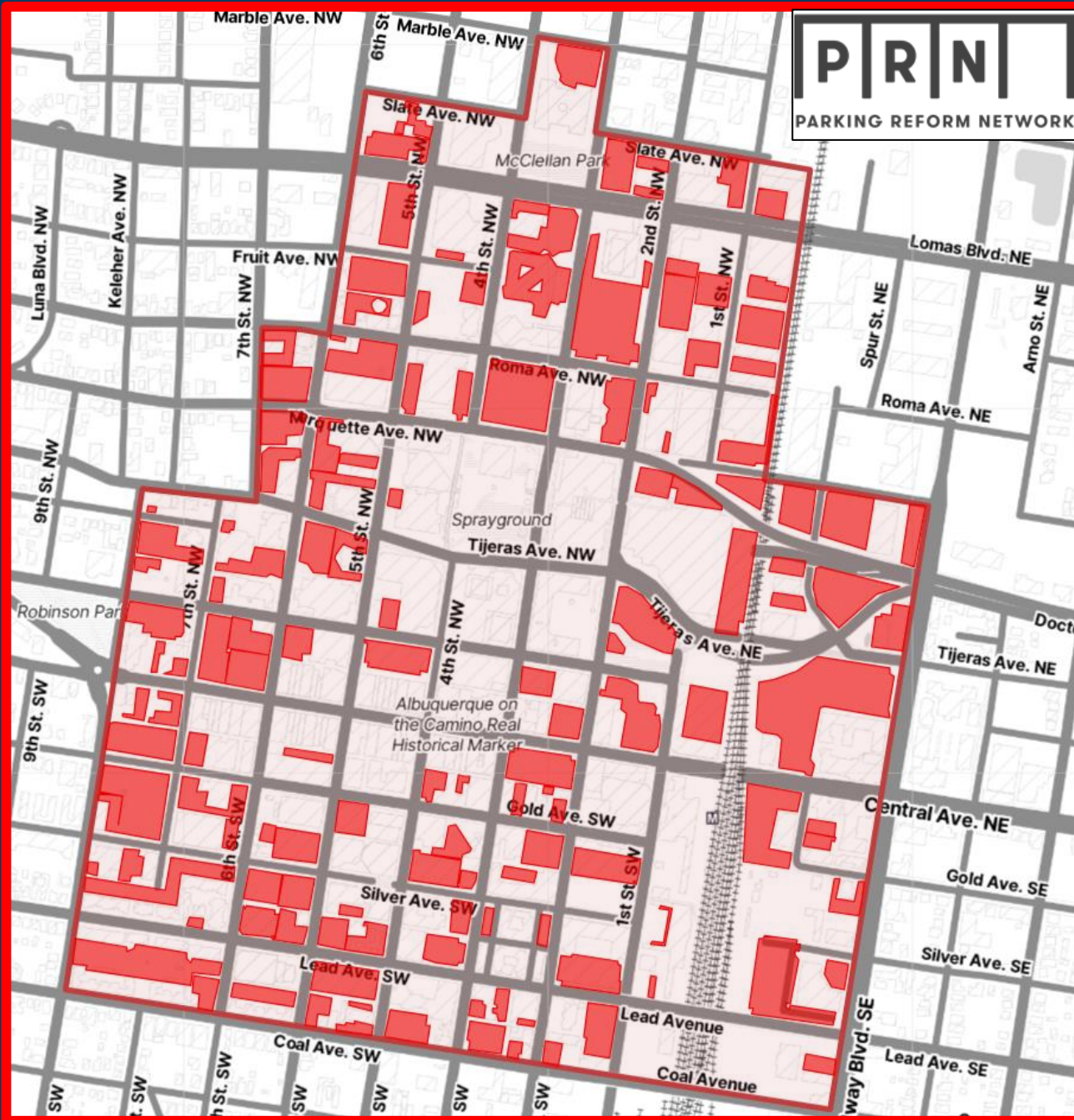
Denver, CO 11%

Austin, TX 17%

Phoenix, AZ 21%

Chicago, IL 4%

Albuquerque ?



Too much! Redevelop lots in New Mexico for more productive uses

Denver, CO 11%

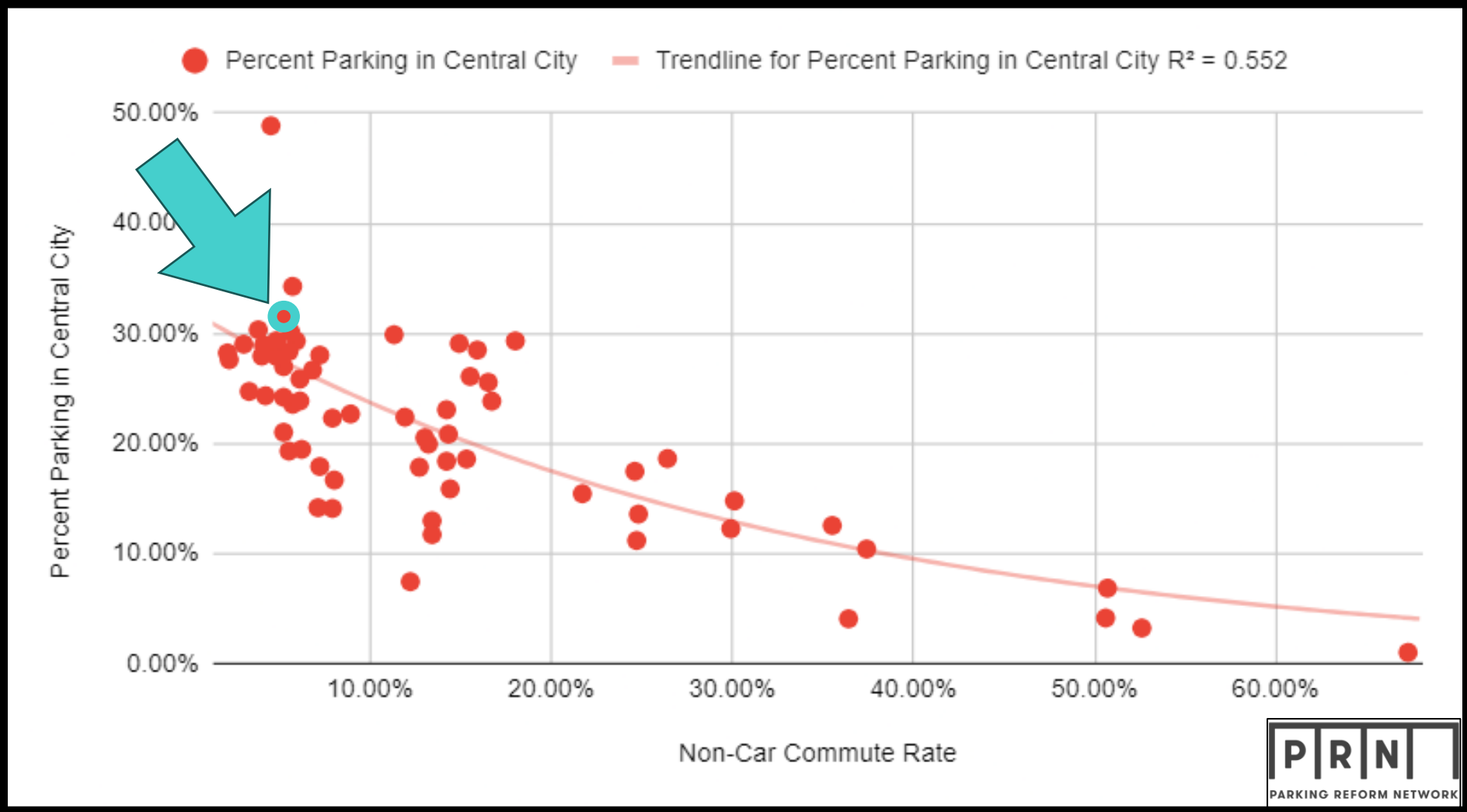
Austin, TX 17%

Phoenix, AZ 21%

Chicago, IL 4%

Albuquerque 33%

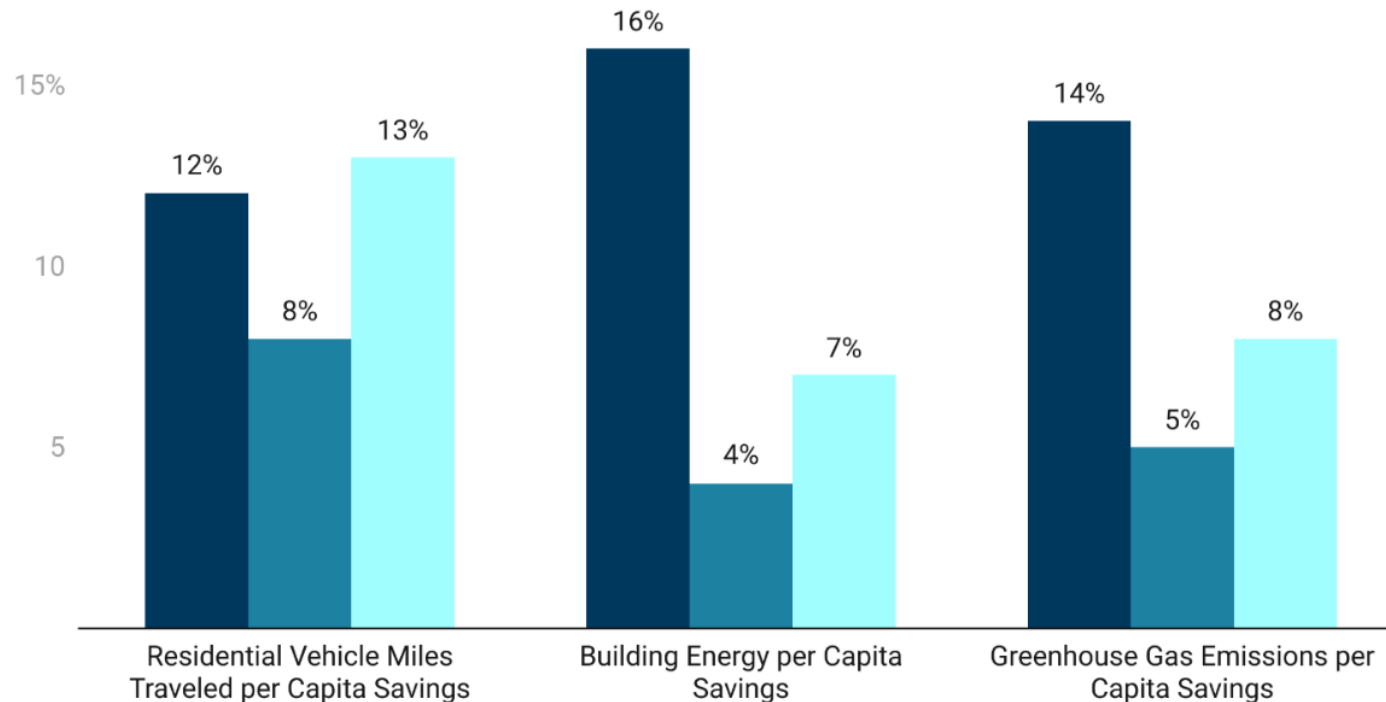
Excess parking must be addressed to unlock benefits of multimodal transportation investments



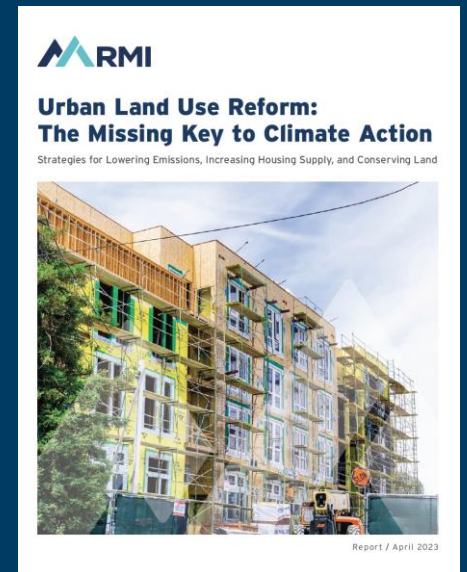
Housing upzoning needed around transit and essential destinations to increase multimodal transport usage + create more affordable units

Total Metro Region Annual Savings from Strategic Land Use Policy Reform in 2040

■ Austin, TX ■ Charlotte, NC ■ Denver, CO



- Reduced VMT ~10%
- Additional savings in:
 - Water
 - Energy
 - Climate
 - Housing
 - Land Conservation



Utah HB-462: Mountain state gives cities menu of reforms to promote smart growth, including:



- Lower parking minimums
- Convert unused retail to mixed-use near transit corridors (TOD)
- Allowing ADU's
- City-owned affordable housing

Note: Cities that don't meet housing targets run risk of losing highway funds

Bipartisan!

Connecticut HB 6107: Cuts red tape and allows accessory dwelling unit (ADU's) to be built...



- by right without special permit or public hearing
- both “attached” and “detached”
- up to 1,000 SF or 30% of the main dwelling
- with relaxed parking & utility connection requirements

Washington HB 1110: Duplexes & 4-plexes must be allowed near major transit stations for...



- all cities between 25,000 – 75,000 people
- all residentially-zoned lots within $\frac{1}{4}$ mile walking distance
- cities with $>75,000$ must allow 6-plexes in same radius

Bipartisan!

Minnesota HF 2887: Metro-area land use plans must align with VMT and climate targets

Metropolitan Council (MPO) must develop a climate mitigation and adaptation guide that includes goals and strategies for meeting or exceeding climate and VMT goals. The climate guide will reside in the Met Council's long-term development guide.



The climate mitigation and adaptation provisions must flow into local comprehensive plans (180+ jurisdictions)



Local land use plans must also include inventories and projections of GHG emissions, including from VMT, and must include analysis of the impact of compact development patterns on VMT and GHG emissions.

Take-away: Policies that promote smart growth and housing will maximize benefits of multimodal transportation investments



Model Policies:

Utah HB 462

Connecticut HB 6107

Washington HB 1110

Massachusetts H 5250

Minnesota HF 2887

Multimodal Transportation State Policy Strategy



Shift investments to expand transportation options

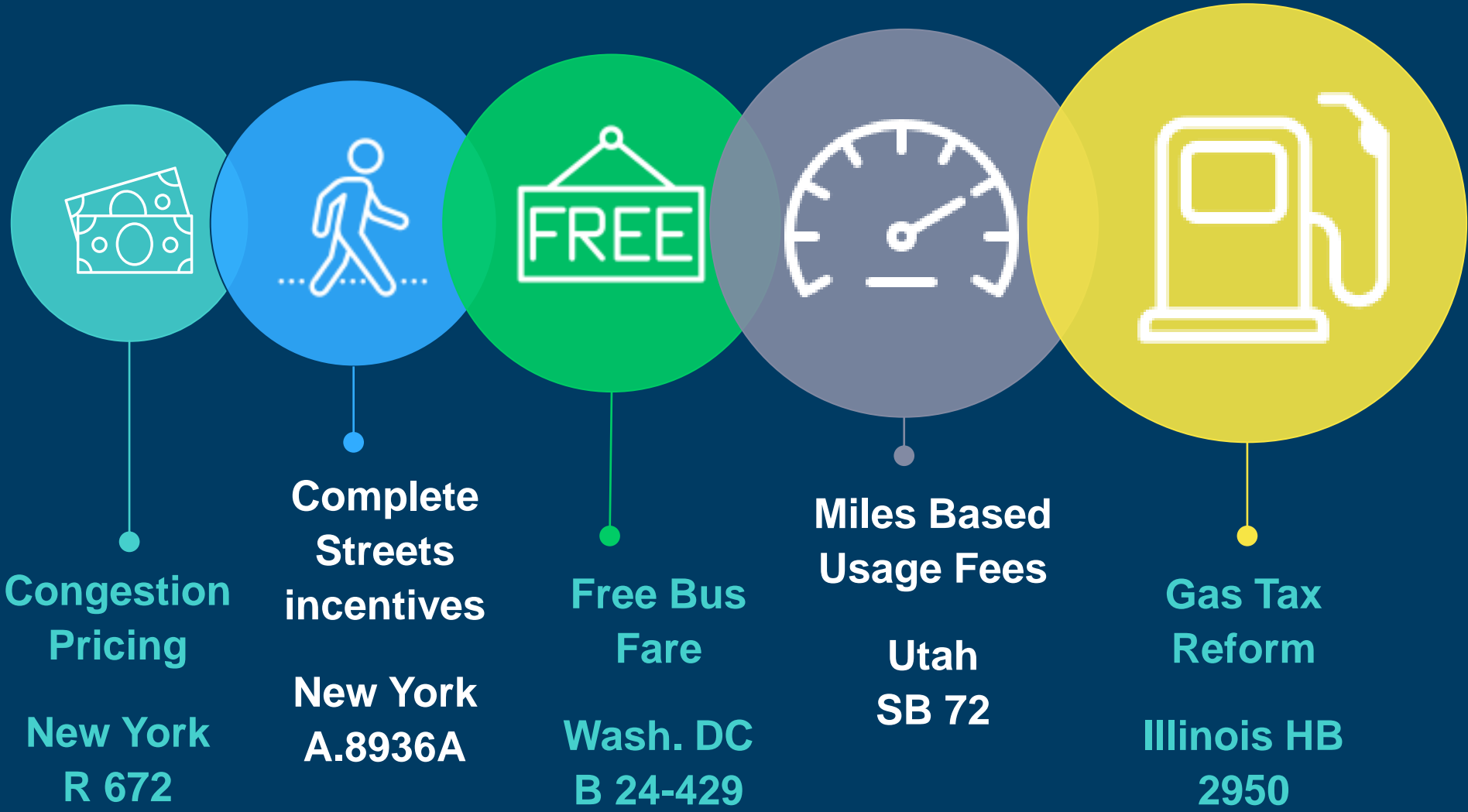


Plan for smart growth in housing & land use



Incentivize more and better mobility options

You can price transportation options differently & nudge commuters towards more efficient modes



E-bike demand and usage has skyrocketed – New Mexico has an opportunity to replace short car trips with new micro mobility options like e-bikes



of car trips in NM
are less than
5.5 miles

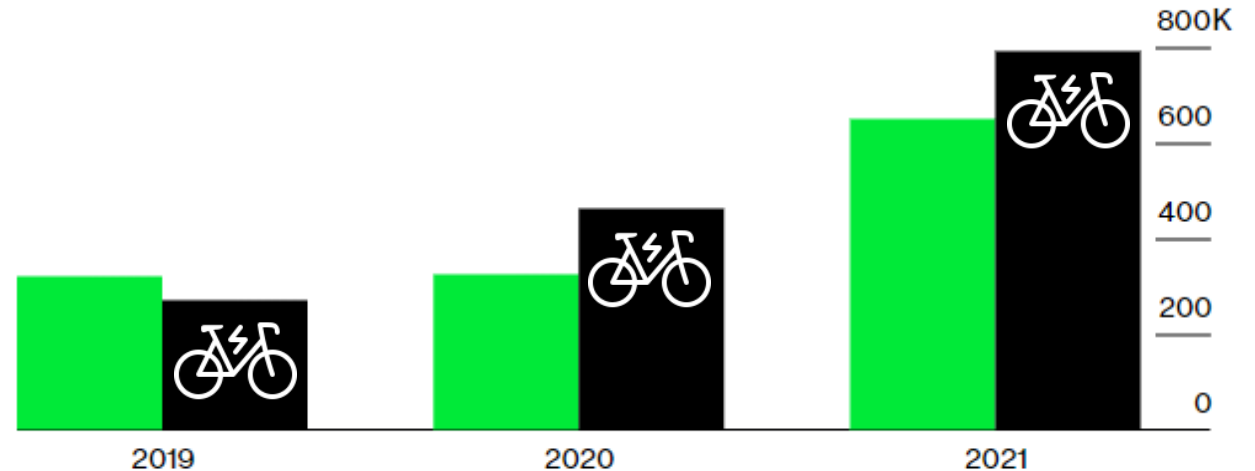
electrek

New Deloitte study puts e-bikes ahead of e-cars as most popular and 'most attractive' electric transportation

E-bikes vs. EVs

Import data shows e-bikes surpassing electric cars in the U.S. market.

■ EVs* ■ E-bikes



Sources: BloombergNEF, Light Electric Vehicle Association

*Includes plug-in hybrids



Widespread e-bike adoption faces challenges...



Lack of safe biking infrastructure



Lack of e-bike rebates and tax incentives



Upfront cost of better-quality e-bikes



Societal attitudes towards e-bikes and preference for automobiles

...but when implemented correctly, e-bike programs unlock many benefits. Denver's program successfully reduced car usage, saved commuters money, and cut climate pollution



RMI analysis found:

- 2,040 MT reduction in CO₂e emissions
- \$1 million in fuel and maintenance savings for the first year
- Per mile, e-bikes cost nearly 75% less than ICEVs
- 3.4 car trips replaced per week by participants
- Participants biked an average of 26 miles/week

Colorado SB 22-193: Statewide e-bike subsidy expanded on Denver success w/ equity emphasis

- \$1,000 for e-bike & \$1,500 for cargo e-bike if less than 80% AMI
- Up to \$500-\$900 for all other residents
- Capped at \$12 million, to be expanded in future iterations



E-bike calculator – RMI tool can help design your transportation rebate programs.

- Calculator analyzes impact of switching car trips under five miles to e-bikes in urban environments
- Designed to help city officials and planners understand the benefits of e-bikes, rebate programs, and bike infrastructure from a climate and economic perspective
- Current version includes scenarios & data for Albuquerque + Sante Fe

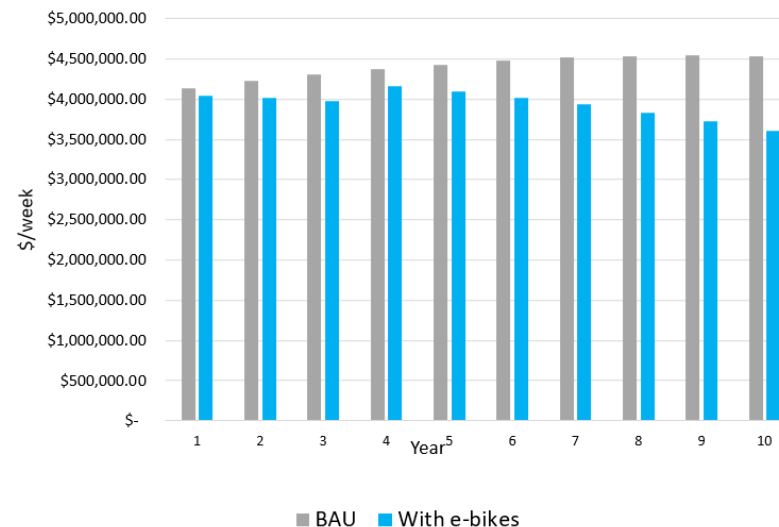
Impacts of a city-wide vehicle trip replacement goal for Albuquerque, NM

Assumptions and Notes

1. The analysis assumes that the e-bike is used for two trips per day, or used 14 times total in a week.
2. The scenario assumes 18,640 e-bikes added per year and that each bike is used for 31 miles per week, or 2.2 miles per trip (Denver's e-bike rebate program saw an average of 26 miles biked per week per person).
3. BAU on this tab refers to "Business-as-Usual." BAU assumes that vehicles are used to continue driving short vehicle trips, rather than being replaced with another mode.

Economic Impacts

Weekly Cost of 5 Mile Trips



In ten years, the selected e-bike trip conversion will result in 21% lower costs for fuel and maintenance over continuing to use vehicles for trips originating within the city limits of Albuquerque, NM.

Per person who gets an e-bike in this analysis, each person could save at least \$239.93 on average per year. These savings would come from a reduction in vehicle fuel costs and vehicle maintenance costs. Some individuals might be able to get rid of a second or third vehicle if e-biking is a safe and viable alternative.

Minnesota HF 2887: New taxes & incentives create sustainable revenue + nudge commuters towards most efficient modes



**Gas Tax
Indexed to
Inflation**

**Retail
Delivery Fee
on purchases
>\$100**

**Metro Sales Tax
to sustainably
fund transit**

**Free Fare
pilot for
seniors using
transit**

**E-Bike &
EV
Subsidies**

Minnesota HF 2887: New taxes & incentives create sustainable revenue + nudge commuters towards most efficient modes



STREETSBLOG USA



STATE POLICY

Did Minnesota Just Release the Best Statewide Transportation Bill Yet?

Take-away: New Mexico should incentivize more & better mobility options w/ new programs and pricing



Model Policies:

New York R 672

New York A.8936A

Wash. DC B 24-429

Utah SB 72

Illinois HB 2950

Colorado SB 22-193

Minnesota HF 2887

Multimodal Transportation State Policy Strategy



Shift investments to expand transportation options



Plan for smart growth in housing & land use



Incentivize more and better mobility options

There are tremendous health, safety & economic benefits to **expanding multimodal transportation options.**

New Mexico can unlock these benefits now by adopting **innovative state policies** today

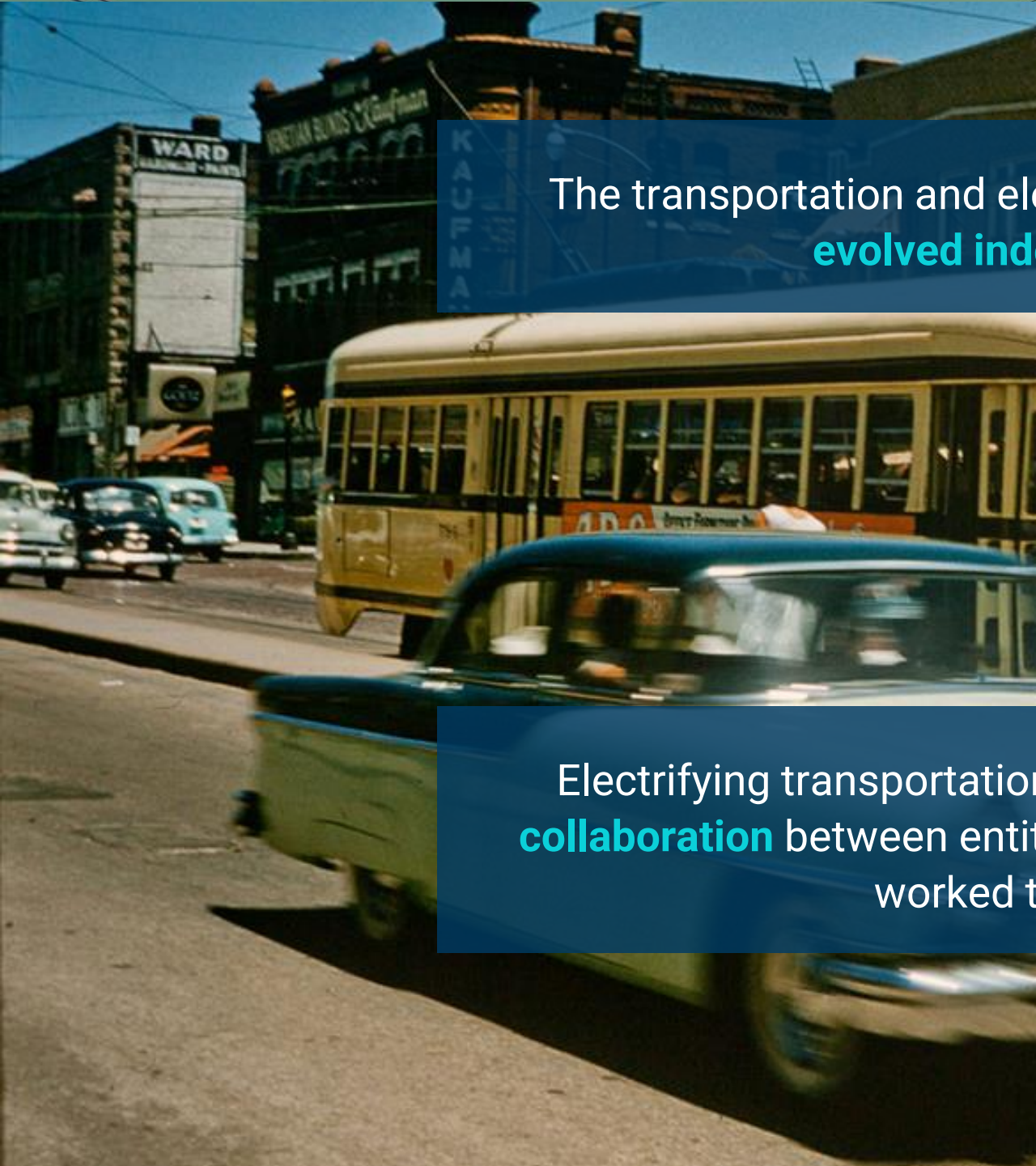
Questions:

Miguel Moravec
mmoravec@rmi.org

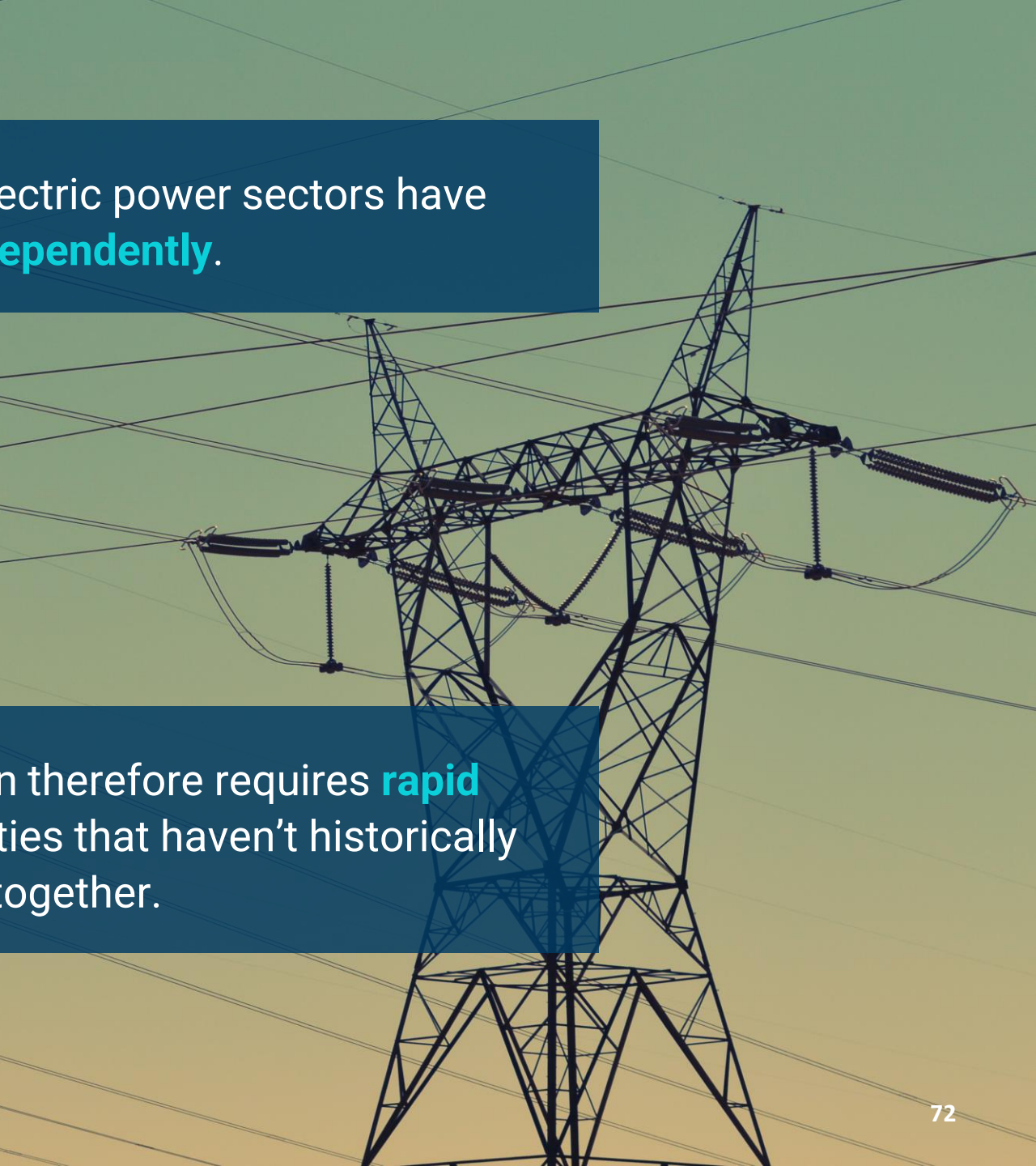


Challenges and Opportunities in Transportation Electrification

September 29, 2023

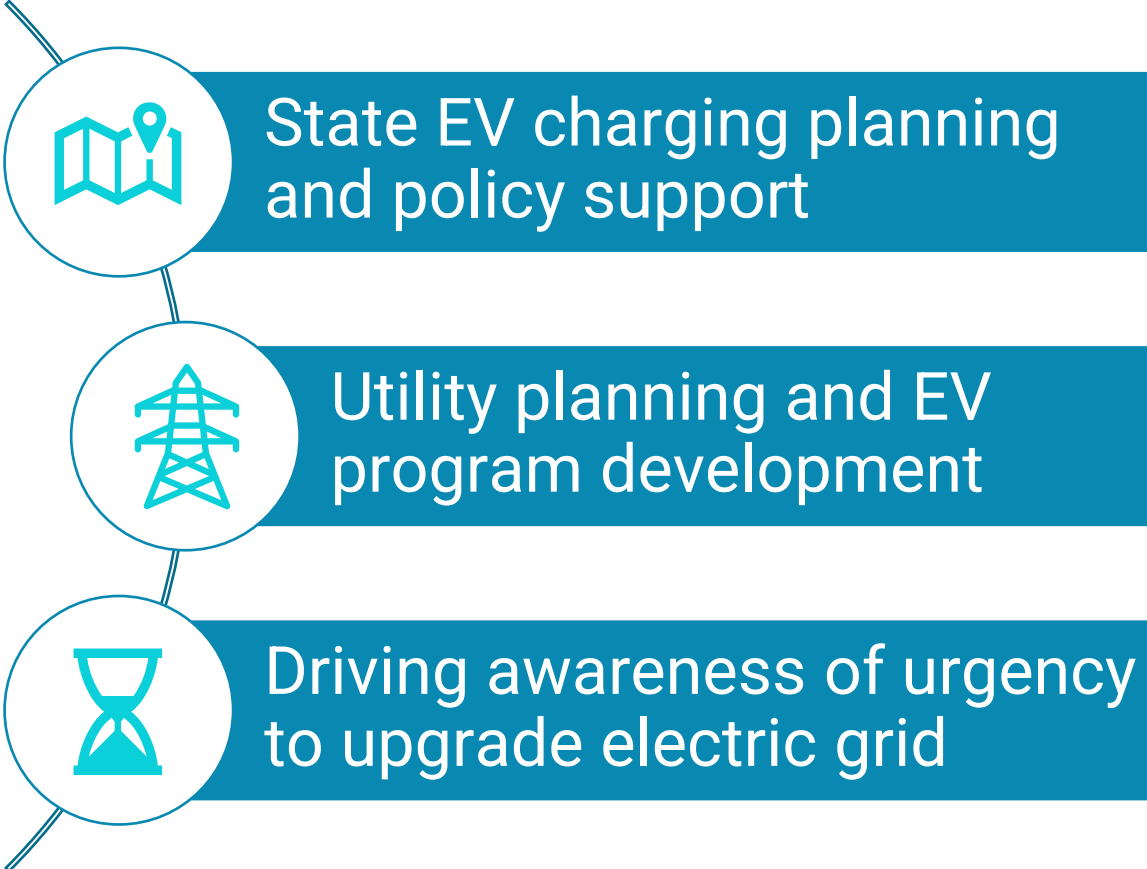


The transportation and electric power sectors have **evolved independently.**



Electrifying transportation therefore requires **rapid collaboration** between entities that haven't historically worked together.

RMI has a long history working with key stakeholders across both sectors, aiming to prepare for accelerated EV uptake



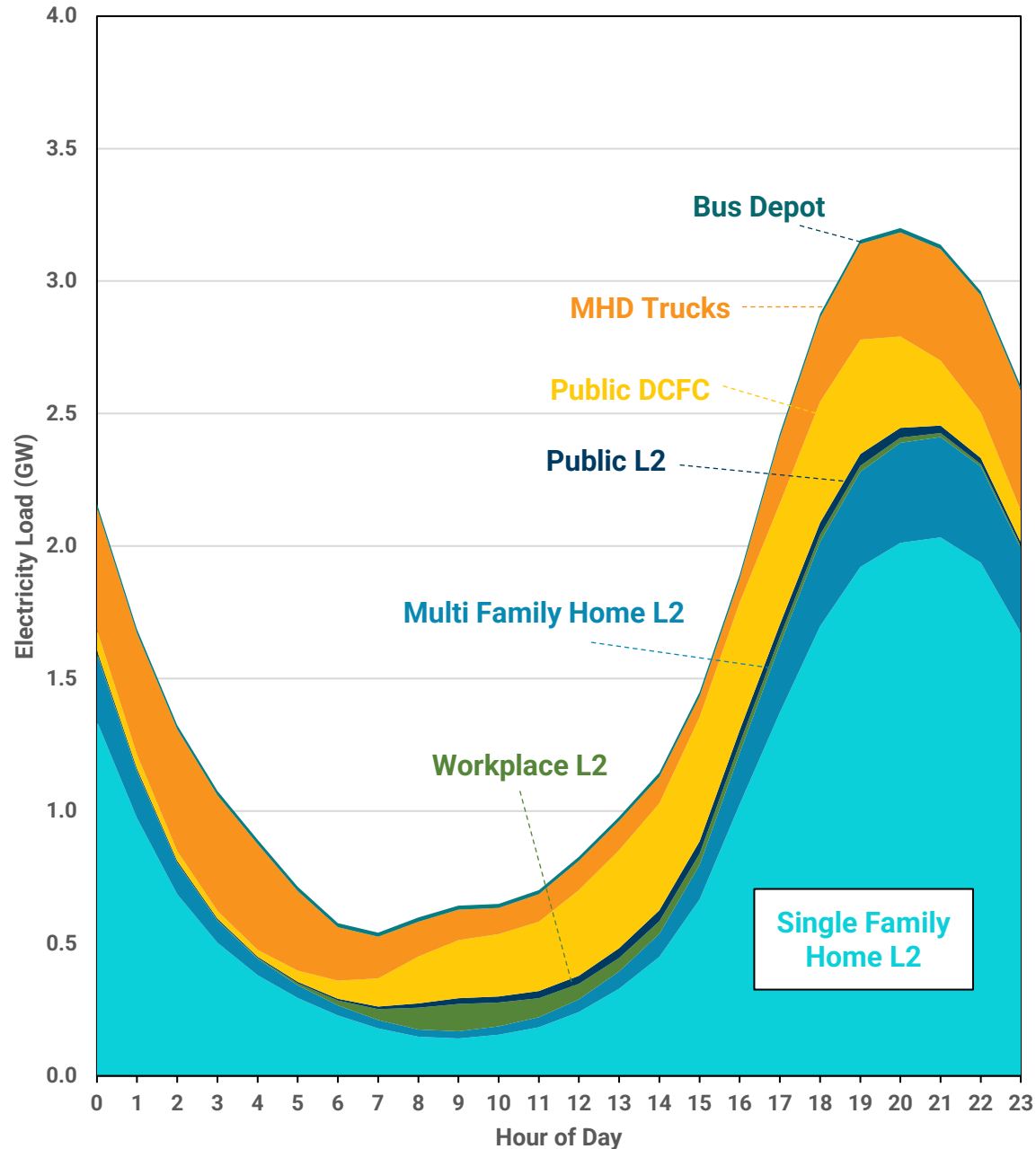
Washington State Transportation Electrification Strategy

RMI is supporting Washington to develop a strategy that can achieve state transportation electrification and equity goals



Multiple, parallel workstreams serve to inform a data-driven strategy inclusive of public input and support.

Estimated 2035 EV Charging Load
Washington State (average weekday, unmanaged)



EVs will add significantly to electricity needs

- **By 2035, EVs in Washington state are estimated to require 14-15 TWh annually**
 - ~16-17% of current electricity usage
- **Critical to manage this load and avoid driving up peak (3+ GW)**
 - Managed charging programs
 - On-site generation and storage

Electric Highways Study with National Grid

Innovative RMI analysis using vehicle telematics data

- Both pace and magnitude of vehicle electrification remains a blind spot
- Individual charging sites will require massive amounts of power, often from the transmission system
- Timelines for developing supportive grid infrastructure are out of sync with anticipated needs

Electrical Capacity Required to Meet Annual Peak Demand at Each Site Compared to Other Large Energy Users

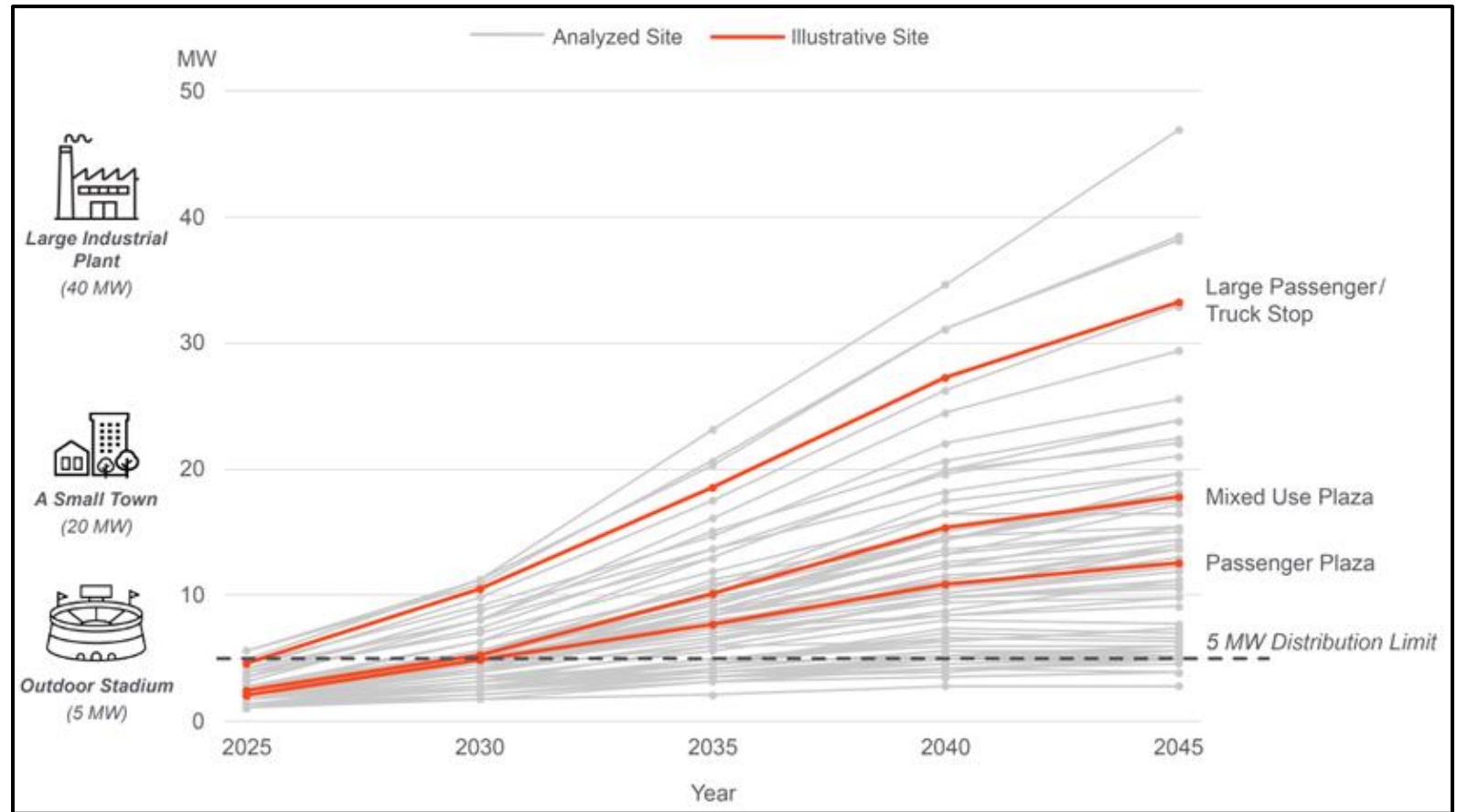
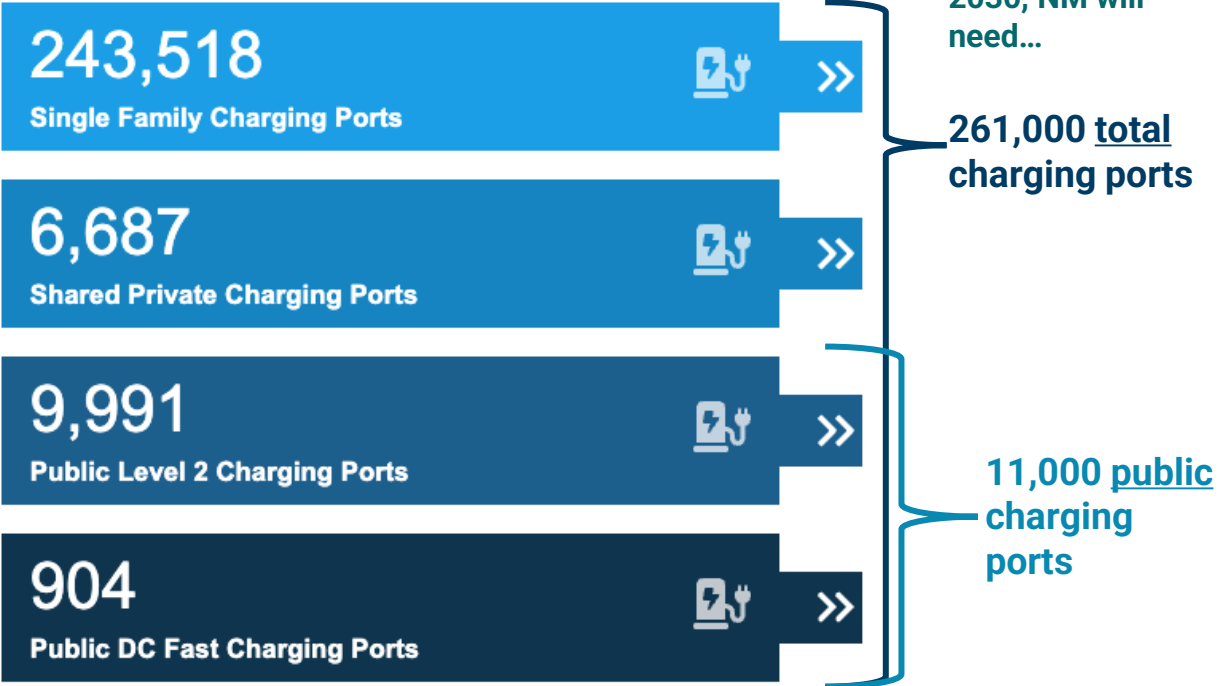


Chart shows electricity peak demand for individual charging sites.

Exponential growth in EV charging will be required in New Mexico

What kinds of charging ports are needed?

Click on the categories to see how they break down by location



- New Mexico will require ~261,000 charging ports to support light-duty EVs in 2030
- Currently NM has ~600 public charging ports
 - 400 Level 2, 200 DCFC
 - **25x and 4.5x growth required!**

How can New Mexico fund its roadways?

Context: Fuel taxes fund 16.6% of New Mexico's highway budget

Nationally, fuel tax revenue has fallen as vehicles have become more efficient. An average new 2020 vehicle, compared to one from 2005, is almost 30% more efficient

New Mexico had 7,080 EV registrations, or 0.4% of all vehicles (as of 12/22). Today, EVs minimally impact revenue shortfall.

Fairness & Policy Considerations

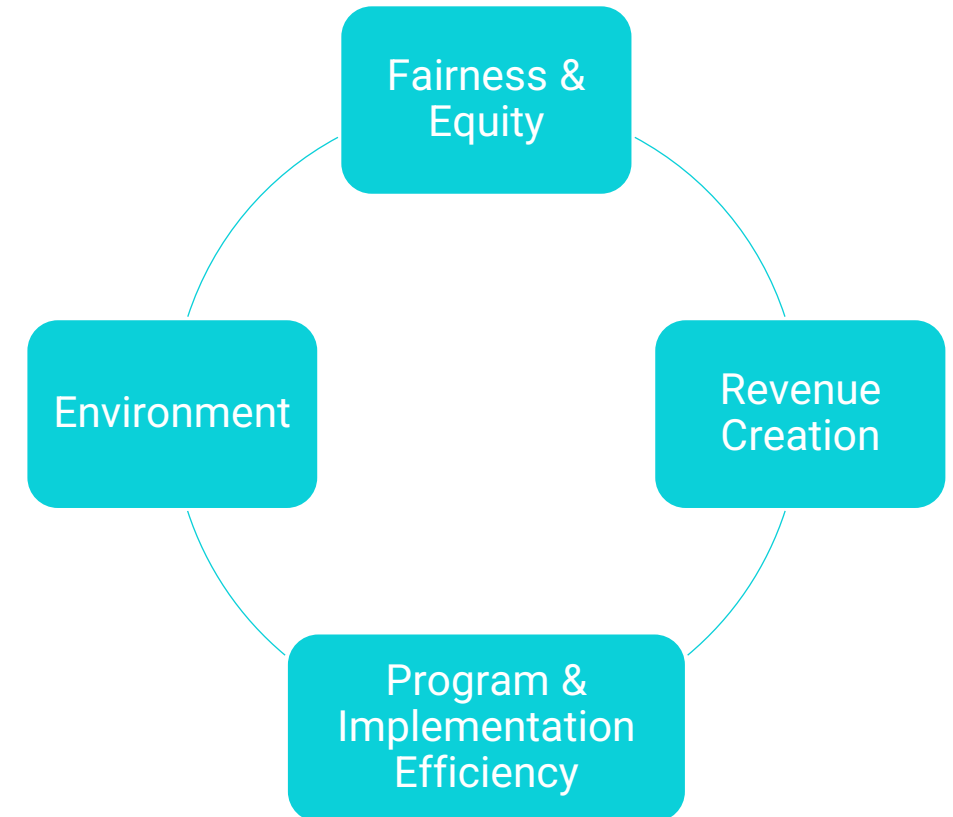
EVs should contribute to road building and maintenance. Electricity unlike gasoline, is already taxed via NM's GRT.

Environment & Equity

Increased registration fees may depress EV uptake ([link](#)) & harm low mileage and low-income drivers.

Recommendation: Study effectiveness of other states' new policies, such as Virginia's holistic new system.

Program Considerations



Closing Thoughts

Key Takeaways



EV load is coming quickly, and will be large



Medium-/heavy-duty load will be significant, and concentrated

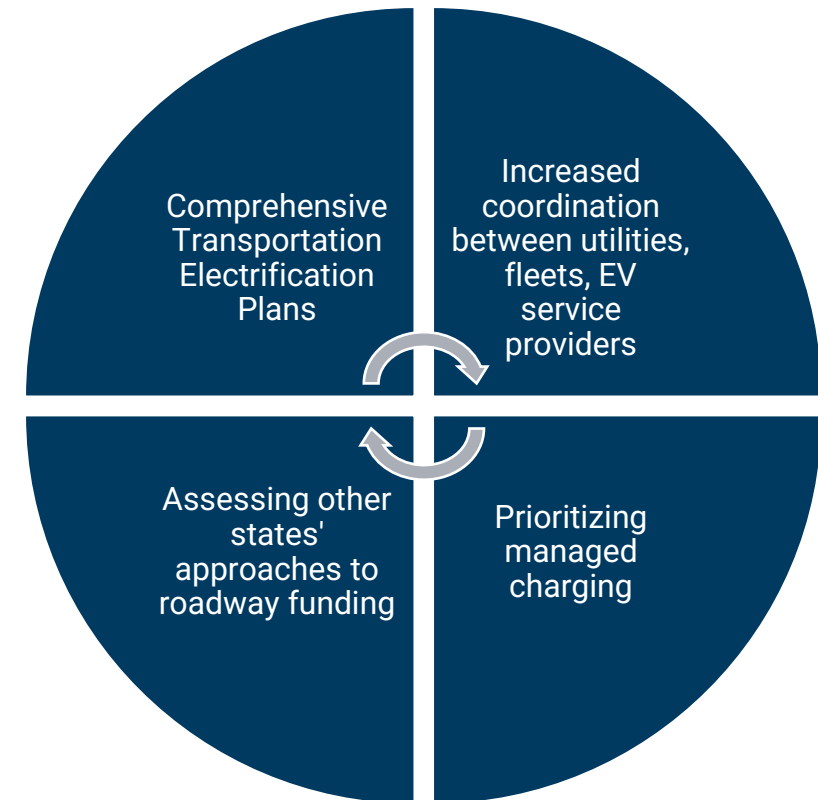
- Depot locations
- Highway charging



Planning ahead will reduce costs and unlock benefits

- Grid infrastructure / future-proofing
- Add'l Registration fees for EVs is neither a quick nor long-term solution

Strategies to Consider



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