

# The Motor Fuel Tax: A System at Risk

## Framing the Problem for America

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*September 14, 2018*



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Presented at:  
**NCSL Southern States Fiscal Leaders Meeting**  
New Orleans, LA

# The Motor Fuel Tax

- The motor fuel tax has been the primary source of funding for transportation for close to 100 years
  - It's simple and efficient, but...
  - It's probably doomed to fail in the future!
- What's the problem?
  - With continuing increases in fuel efficiency, and a coming shift to all electric vehicles, tax revenue will be decreasing while travel is increasing
- The **Ultimate Policy Contradiction**: Transportation Funding is based almost entirely on the taxation of a commodity that our nation is aggressively trying to reduce the use of:
  - **GASOLINE**
- It's a serious problem for transportation funding if we stick primarily or exclusively with the gas tax going forward
  - States will need new sources of transportation revenue in the future

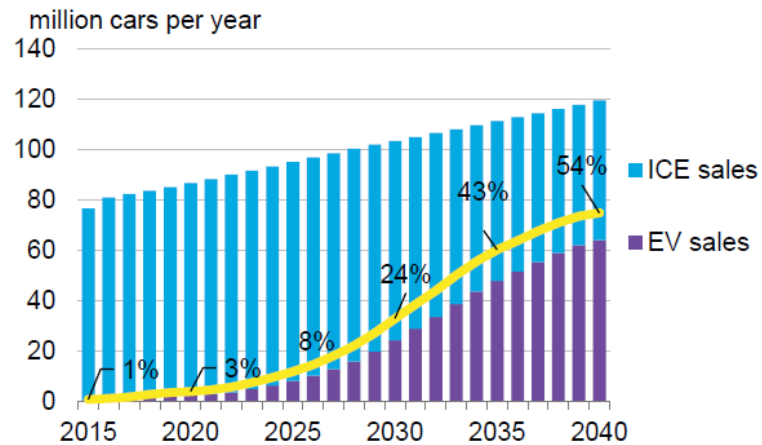
# U.S. Energy Information Administration (EIA) Forecasting

- EIA Produces annual forecasts of future energy consumption, including all forms of motor fuel
  - Latest forecast: Annual Energy Outlook 2018
  - Projections extend from 2018-2050
- EIA national forecasts used as benchmark in this analysis
  - Forecast of vehicle miles of travel (VMT)
  - Baseline “reference case” forecast of average fuel efficiency by vehicle category
  - Forecasts of motor fuel consumption
- Electric Vehicle Assumptions
  - EIA estimate assumes EVs reach about 15% of new car sales by 2050
  - Bloomberg Energy estimates EVs will reach 50% of new cars by 2038

# A Big Shift to Electric Vehicles

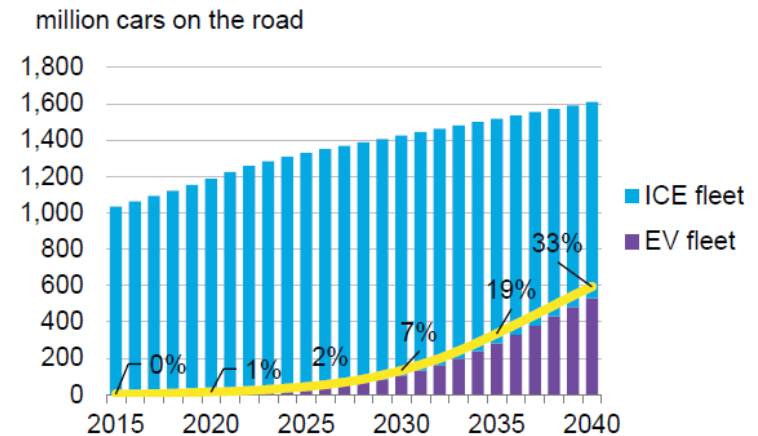
- Will greatly impact transportation funding if we continue to rely on the gas tax for revenue
- *Bloomberg Energy* now estimates new sales of fully electric vehicles will exceed cars with internal combustion engines by 2038

Figure 1: Annual global light duty vehicle sales



Source: Bloomberg New Energy Finance

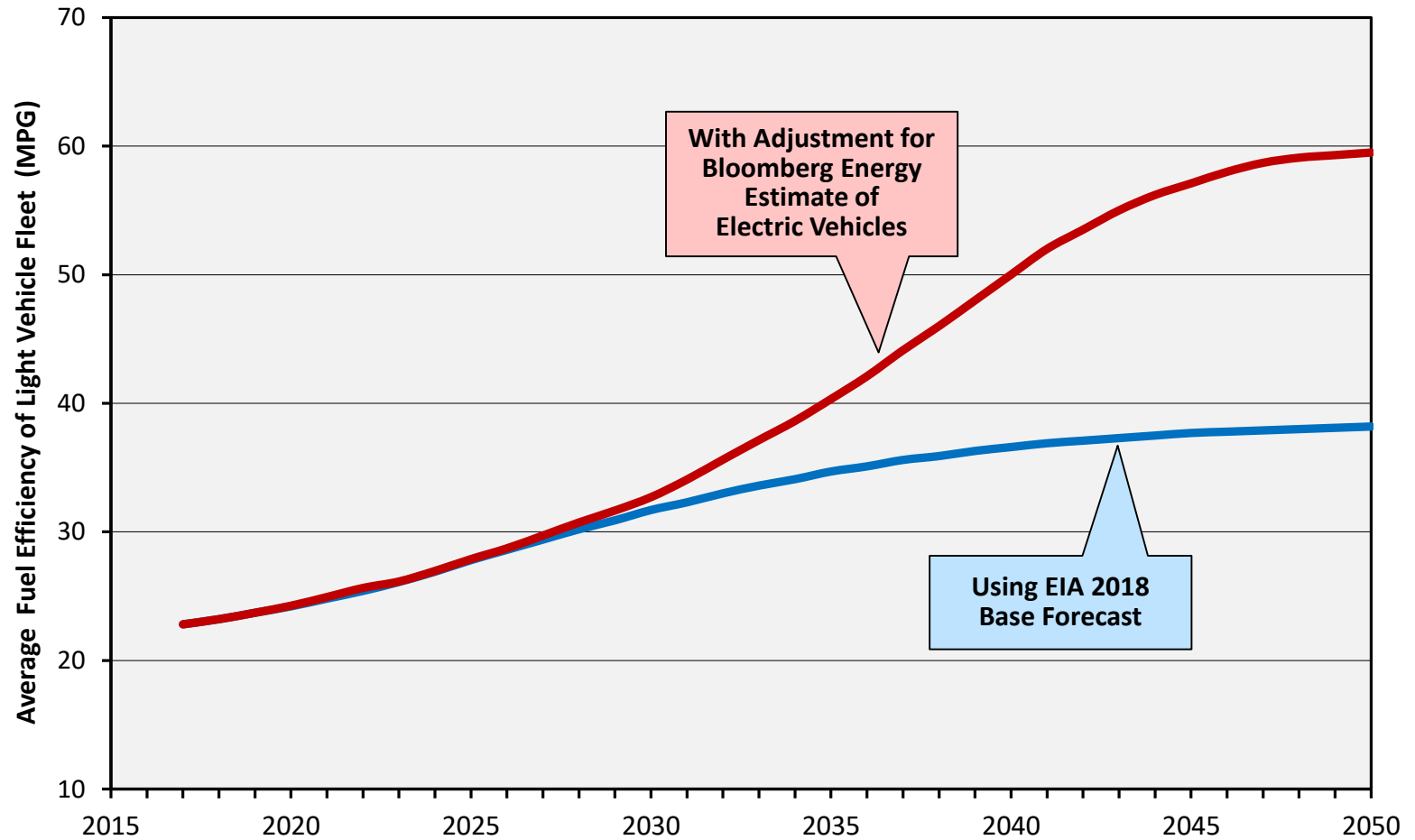
Figure 2: Global light duty vehicle fleet



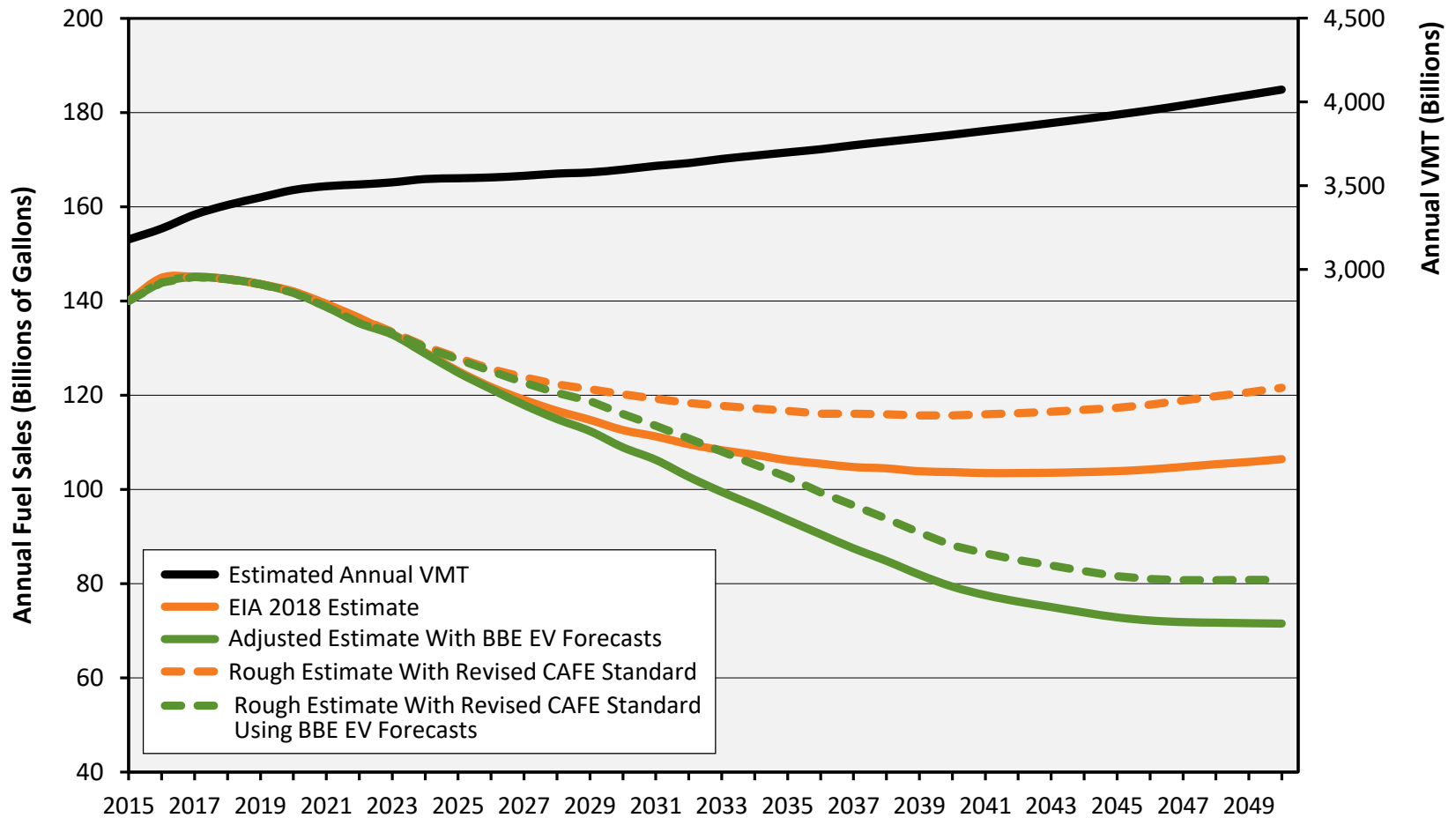
Source: Bloomberg New Energy Finance

# Estimated Change in Effective MPG

## Light Duty Vehicles



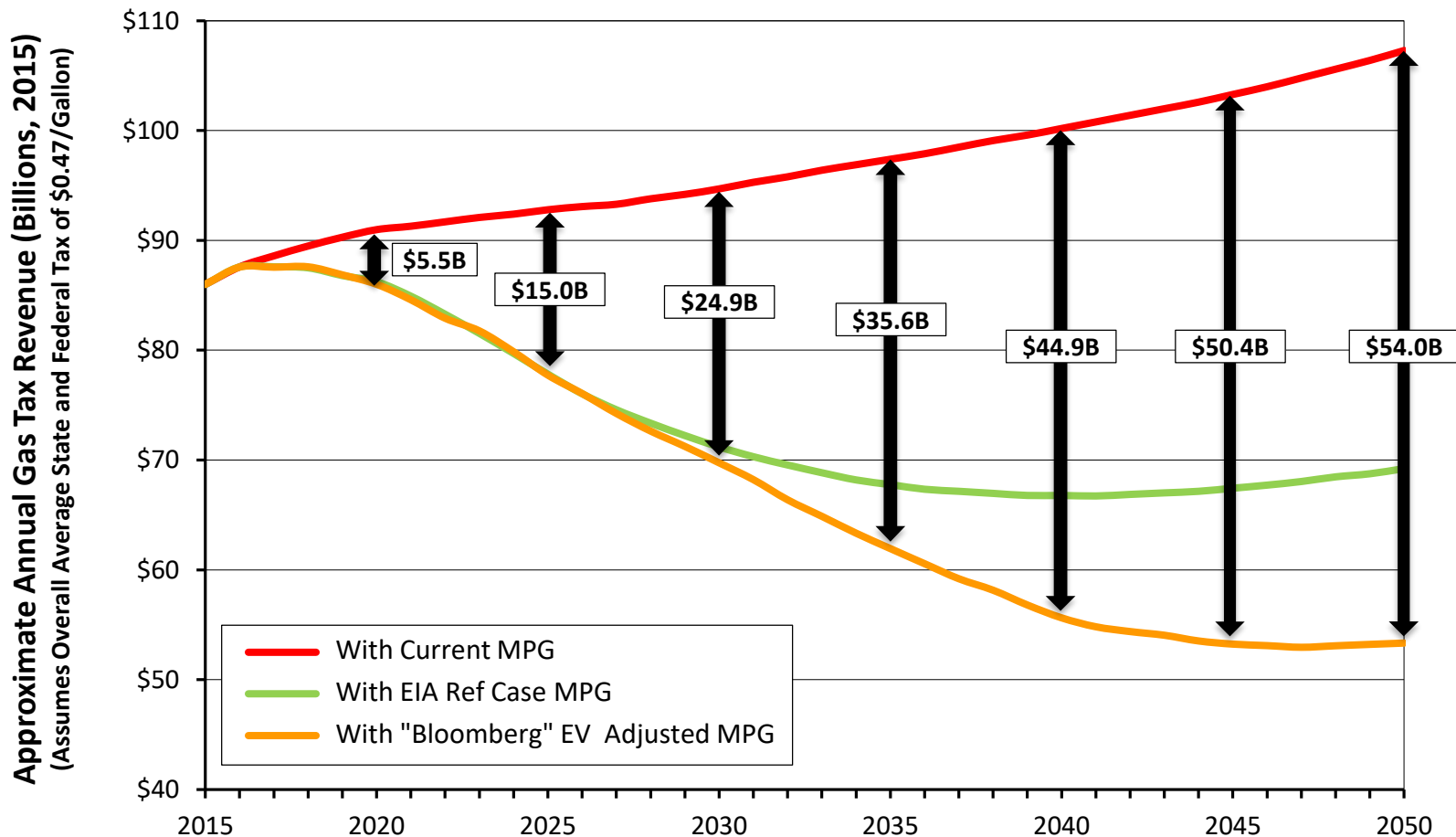
# Projected VMT and Gasoline Sales



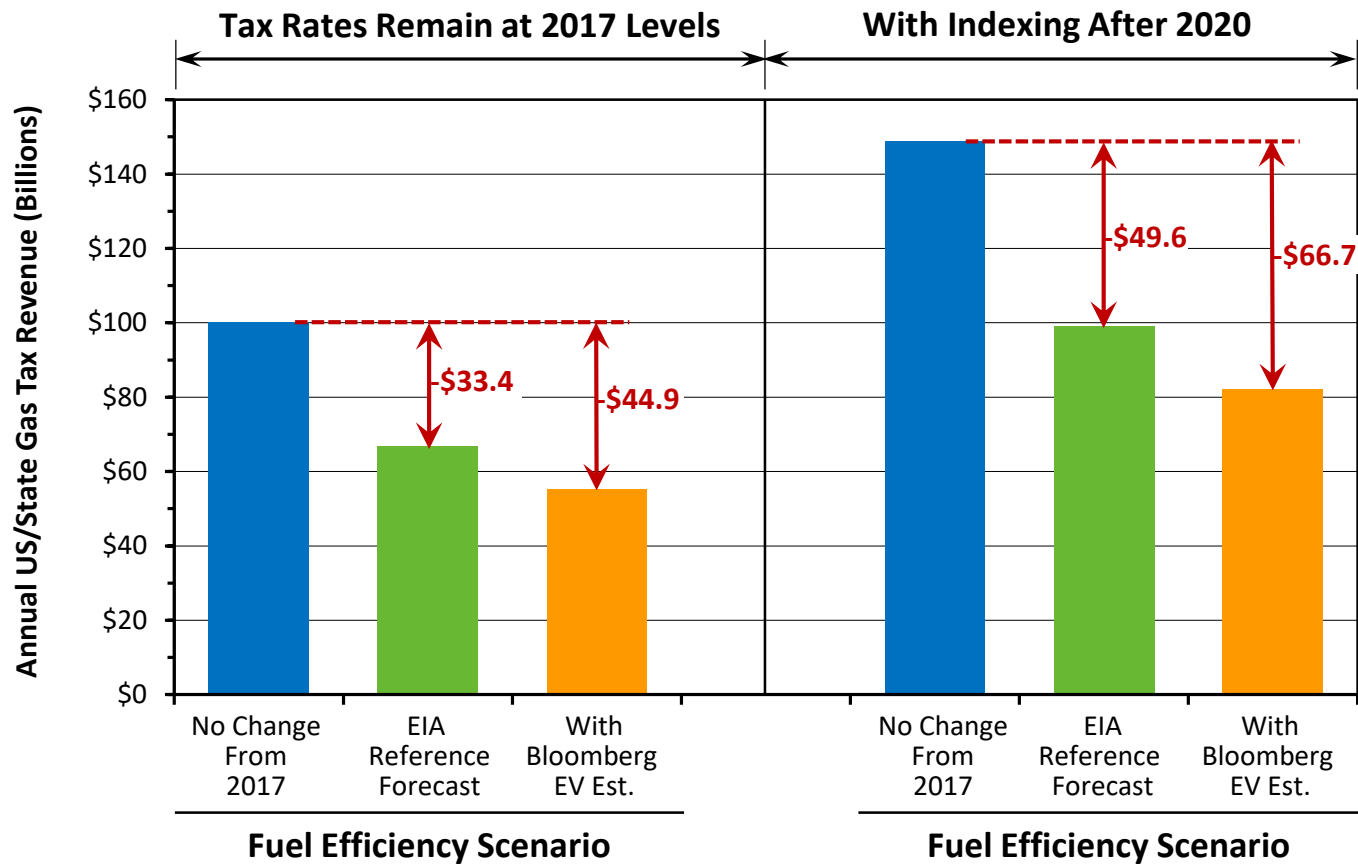
Source: Energy Information Administration.  
Bloomberg New Energy Finance.

# Approximate State and Federal Fuel Tax Revenue

2017 Dollars; Assumes Nominal \$0.47/Gal. Combined Average Tax

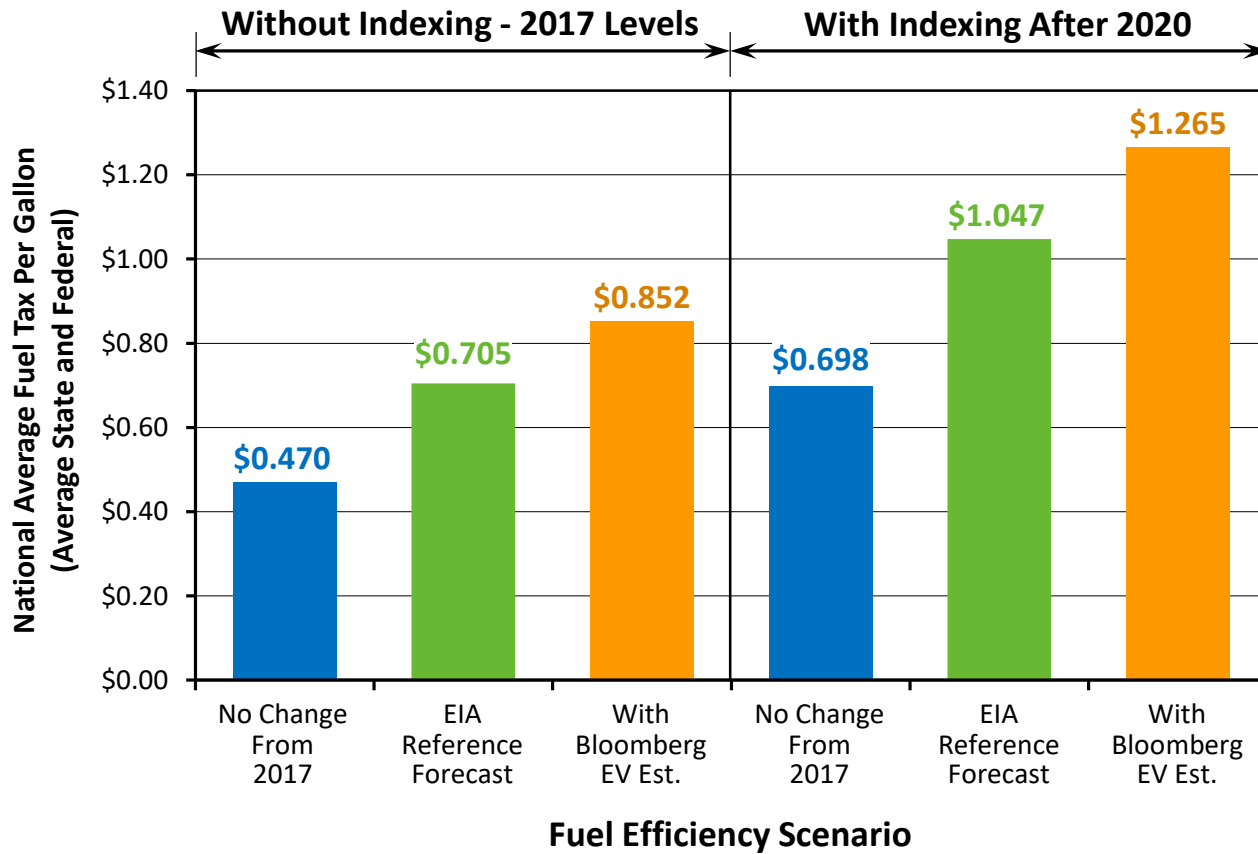


# Comparison of 2040 National Fuel Tax Revenue





# Estimated 2040 National Average Total Fuel Tax Rates



# What it all Means

- The motor fuel tax is becoming increasingly unsustainable due to increased fuel efficiency and future shifts to electric vehicles
- This will exacerbate transportation funding problems throughout the country, including your southern states
  - At the very time there is a need for increased transportation funding, gas tax revenue will be declining
- And it will happen
  - Affect of increased CAFE standards (even with proposed moderation by Trump Administration)
  - Rapid decline if battery prices and increases in battery capacity
  - Transition to autonomous vehicles

# What Can States Do About It

- In the short term, increase gas taxes
  - But gas tax increases will not solve the long term problem of increasing fuel efficiency.
- Indexing of gas tax rates
- Almost all states are looking for new sources of revenue for transportation investment
  - **Adding electronic tolls to existing interstate routes** seems to be gaining interest among many states
  - In the longer term, **shift from a “per gallon” to a “per mile” basis of user fees ...** known as MBUF or RUC

# Interstate Route Tolling

- Generally prohibited on existing free Interstates routes, with exceptions:
  - New capacity .. New routes or new lanes on existing routes
  - Express toll lanes (or managed lanes)
  - Reconstructed bridges and tunnels
  - ISRRPP – three slots have become available
- Increasingly likely that Congress will further reduce restrictions
  - Enable states to make their own decisions
- Most interstates are over 50 years old;
  - Collectively the states spend more every five years on interstate system maintenance, reconstruction and expansion than the entire \$130 billion federal investment to build the 48,000 mile system in the first place
    - so much for “they’re already paid for”

# Average Revenue Per Year - 2020-2040

## Southern States

2017 Dollars (millions)

State	Average Toll Rates Per Mile		
	Cars: \$0.04 Trks: \$0.10	Cars: \$0.06 Trks: \$0.15	Cars: \$0.08 Trks: \$0.20
Alabama	\$1,239	\$1,766	\$2,243
Arkansas	\$703	\$917	\$1,162
Florida	\$1,919	\$2,518	\$3,185
Georgia	\$2,018	\$2,812	\$3,602
Kentucky	\$938	\$1,326	\$1,675
Louisiana	\$737	\$998	\$1,249
Mississippi	\$536	\$724	\$884
North Carolina	\$1,290	\$1,779	\$2,233
Oklahoma	\$516	\$620	\$778
South Carolina	\$1,063	\$1,474	\$1,840
Tennessee	\$1,538	\$2,134	\$2,661
Texas	\$4,003	\$5,505	\$6,994
Virginia	\$1,539	\$1,913	\$2,388
West Virginia	\$344	\$423	\$533
<b>Regional Total</b>	<b>\$18,383</b>	<b>\$24,909</b>	<b>\$31,427</b>
<b>U.S Total</b>	<b>\$45,992</b>	<b>\$63,057</b>	<b>\$80,259</b>

Current National Average Per Mile Toll Rates		
Category	Passenger Cars	Heavy Trucks
All U.S. Toll Roads*	\$0.097	\$0.402
Major Interstate Toll Roads*	\$0.074	\$0.315

\* Simple unweighted average of all toll roads

# Why Is Tolling Interstates a Good Short Term Solution?

- In the near term, Interstate tolling is a good option to supplement the motor fuel tax in individual states
- Although interstates represent less than 2% of all highway mileage in the nation, they carry over 25% of the nation's total VMT
- More than a third of all State DOT expenditures are on Interstate Highways
  - When considering major future capital investment requirements, over half are typically on interstate highways
- If interstate toll revenue could be used to fund rebuilding and maintaining interstate routes, revenue from the gas tax can then be used to support work on other state highways

# In the Longer Range: Mileage Based User Fees (MBUF)

- Eventually America will likely move from a “per gallon” basis of taxation to a “per mile” basis
  - Several states have done, or are doing, pilots
- This is probably the ultimate solution for states like yours for declining sustainability of your own motor fuel taxes
- With GPS capability, MBUF could enable a new paradigm in transportation funding and demand management:
  - A more direct linkage between road usage and road charges
  - Variable rates in congested areas to manage demand
  - Local additives in different jurisdictions
    - such as transit subsidies but only in urban areas served by transit
  - More direct allocation of revenue on certain routes to those routes.

# Major Challenges with MBUF

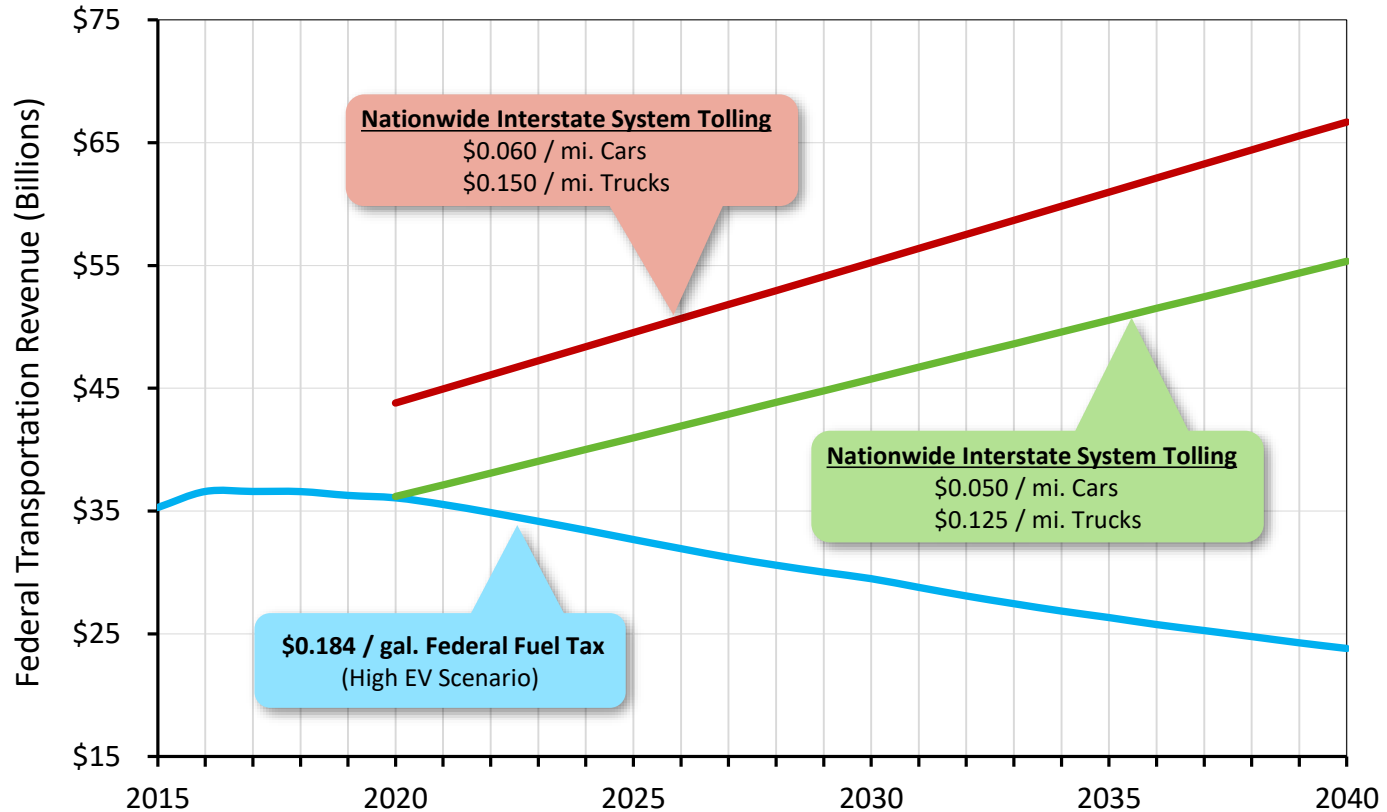
- Privacy concerns: there is a real fear of “big brother” - technically solvable - but will people believe it
  - Most of the “pilots” undertaken to date have largely “avoided” this critical issue by offering non-technology options
  - We should be using part of the \$95 million Federal funding to challenge industry to come up with (and prove) true technology solutions to privacy concerns
- More costly and complex than gas tax... most people don't even realize there is a problem with the gas tax
  - Depending on per mile rates, MBUF collection costs would likely consume 5-8% of revenue
- Enforcement challenges
- Difficult to implement one state at a time; national framework of some sort is needed



# One (Purely Hypothetical) Idea

- We could replace the \$0.184 per gallon Federal gas tax with a direct user fee on the interstate system
- At just \$0.05 per mile for cars and \$0.125 per mile for trucks it would generate more net revenue than the federal gas tax
- But unlike the gas tax, it would keep on growing in proportion to growth in travel, regardless of coming technology change
- It would restore the federal role in transportation funding to the interstate system, freeing other state transportation funding for non-interstate routes

# Estimated Annual Federal Transportation Revenue



## But it Wouldn't be Cheap

- If done with current all-electronic tolling more than 15,000 toll gantries would need to be constructed on 44,000 miles of currently untolled interstates
- Including transponders for almost 200 million vehicles, the total a one time investment in tolling and roadside technology would likely exceed **\$50 billion**
- For the same amount or less, we could equip every vehicle in America with GPS-based technology that could be used for charging interstate route tolls (user fees) with constructing any toll gantries
  - And it would enable the establishment of a framework and accounting system for collecting charges for miles on interstates that can later be “tapped into” by individual states who wish to replace their own gas taxes with mileage based user fees

# Thank You



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