



COMMONWEALTH of VIRGINIA

Office of the

SECRETARY of TRANSPORTATION

Sustainability of Transportation Revenues

Nick Donohue, Deputy Secretary of Transportation
October 16, 2019



Virginia Department of Rail and Public Transportation



2019 Appropriations Act

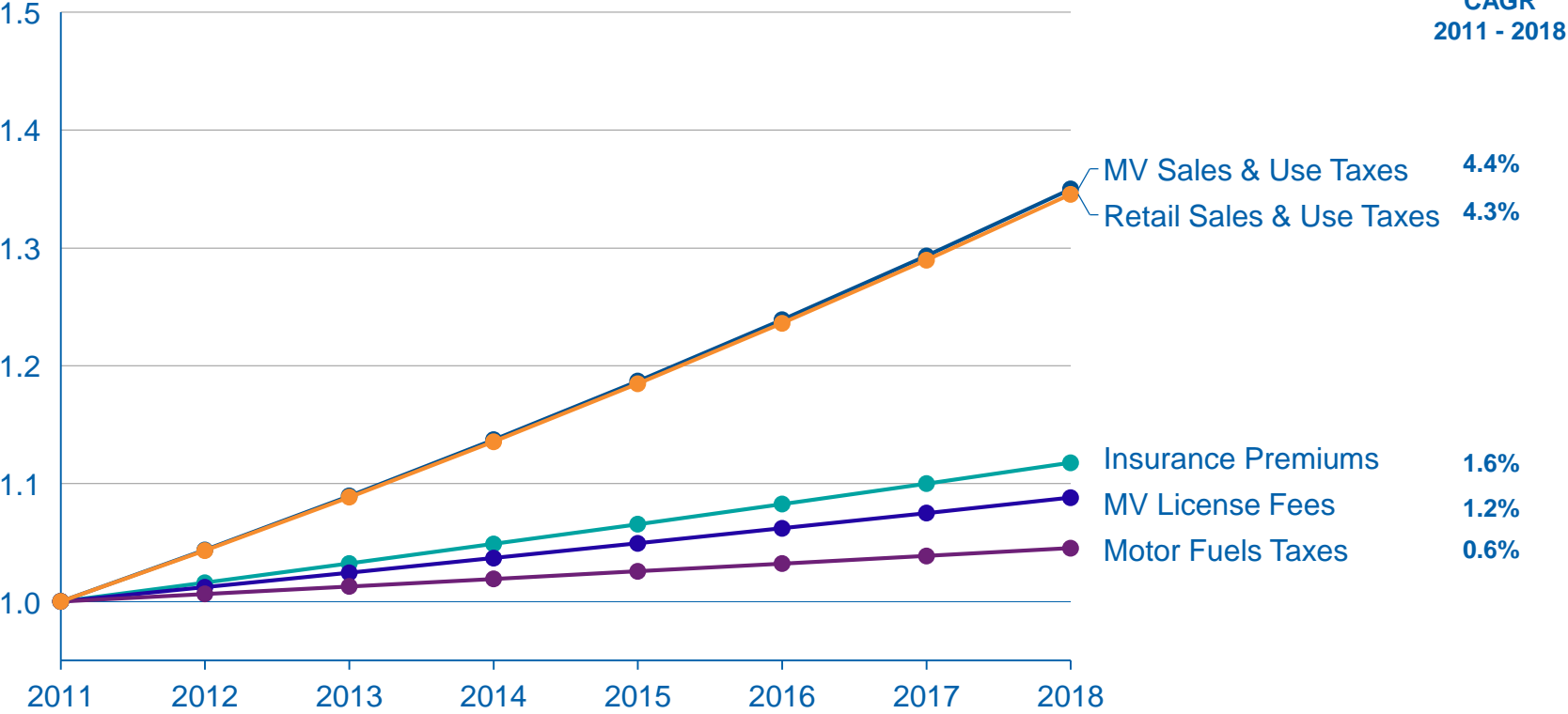
- **It is the intent of the General Assembly Secretary of Transportation and Commonwealth Transportation Board shall... evaluate**
 - **(i) the impact of increased fuel efficiency and increased use of hybrid and electric vehicles on transportation revenues, and**
 - **(ii) potential options to provide a sustainable funding stream for transportation infrastructure**

How is transportation funded in Virginia

CTF Sources	CTF Revenues (FY2018)
Gas Tax	\$638.3
Diesel Tax/Road Tax	\$216.9
Registration Fees/IRP	\$328.0
Motor Vehicle Sales Tax	\$943.7
Retail Sales Tax	\$1,043.8
Insurance Premiums	\$168.0
Misc.	\$107.6

Not all revenue sources are created equal

Revenue Growth Indexed to 2011 Tax Rates^{(a)(b)(c)}



Note(s): (a) Insurance Premiums and MV Licenses Fees are not indexed – instead their revenues are depicted above; (b) Tax rates are as follows: (i) Gas excise tax rates, 2011-2012=0.175 cpg, 2013-2014=0.111 cpg; 2015-2018=0.162 cpg; (ii) Diesel excise tax rates, 2011-2012=0.175 cpg, 2013-2018=0.202 cpg; (iii) MV Sales and Use, 2011-2013=3.00%, 2014=4.00%, 2015=4.05%, 2016=4.10% 2017-2018=4.15%; (iv) Retail tax rates, 2011-2012=0.5%, 2013-2018=0.8%, with additional 0.7% for NoVA and HR; (c) Curves have been smoothed using CAGRs

• Source(s): VDOT

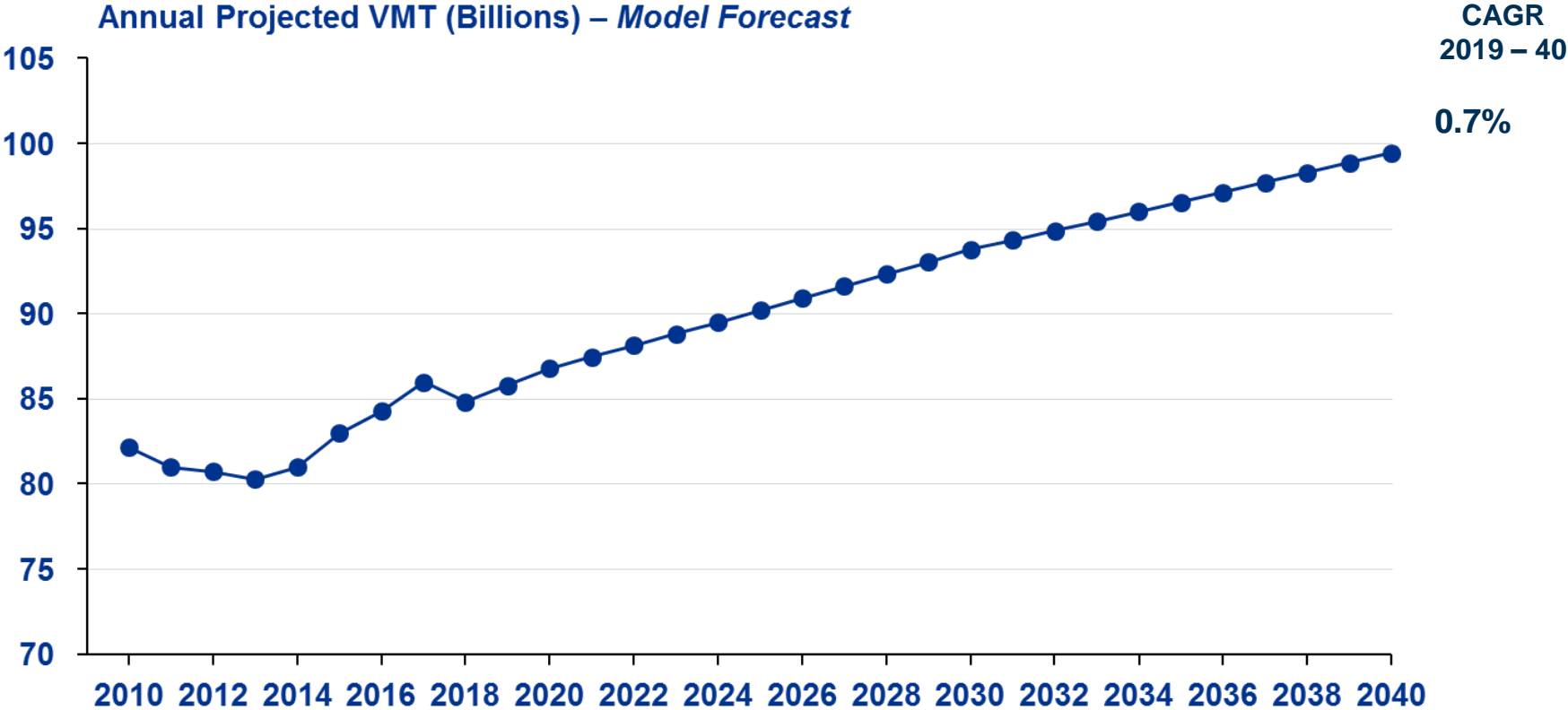
Fuel tax collections FY16-18

- **Vehicle miles traveled increased 3.2%**
- **Fuel tax collections decreased 0.4%**
- **First time driving increased and fuel tax collections decreased at the same time, without a change in rate**
- **In FY18 fuel tax collections would have been \$31.3M higher if they had kept pace with driving**

FY19 fuel tax collections

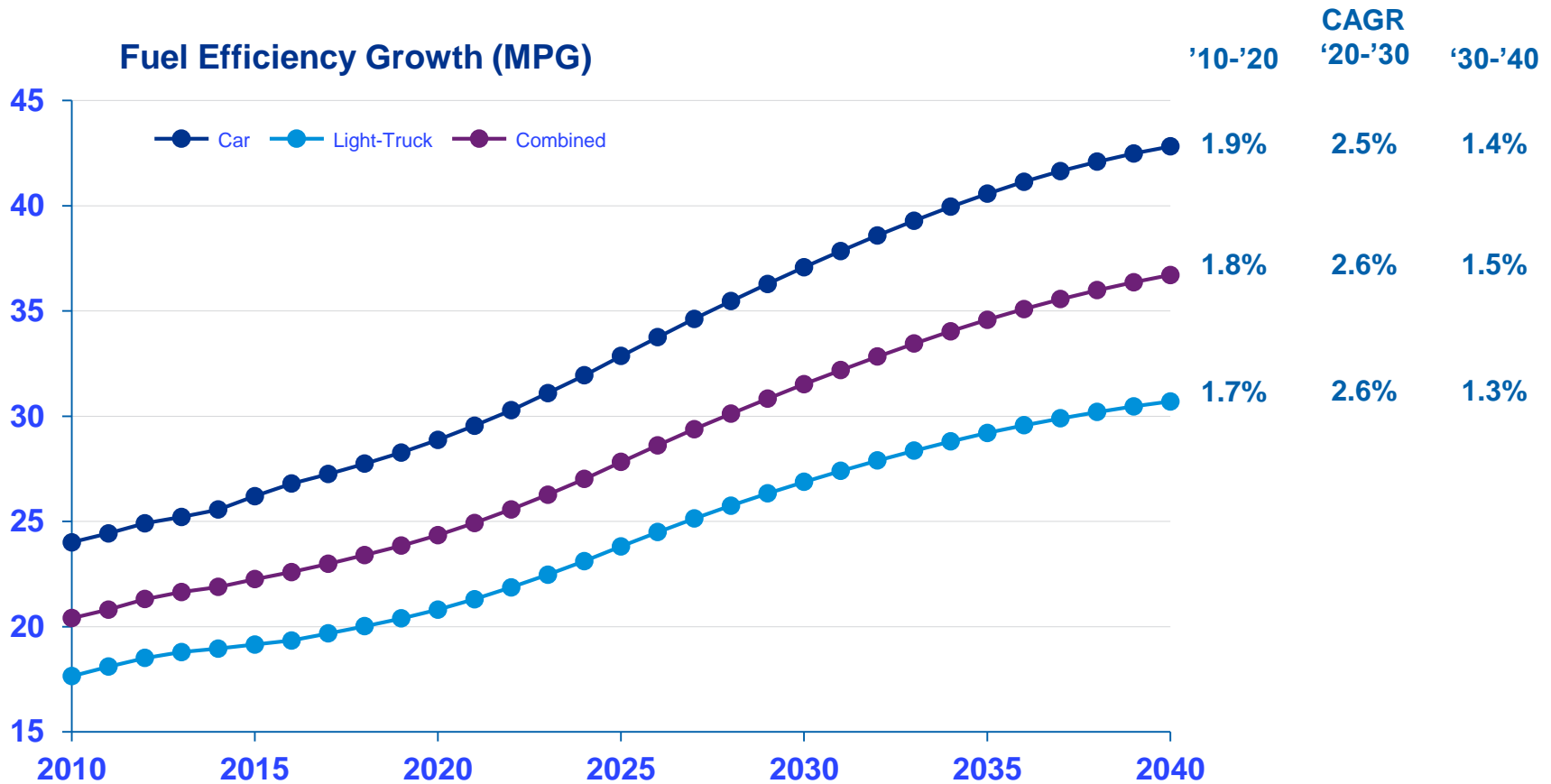
Fiscal Year	Forecasts	Actuals
FY16	\$883.5	\$860.1
FY17	\$868.9	\$872.2
FY18	\$898.7	\$857.2
FY19 (thru June)	\$905.5	\$856.6

Forecast Vehicle Miles Traveled (VMT)



Source: Virginia DMV; US Census Bureau; KPMG analysis (population regression)

Internal Combustion Engine Efficiency Gains

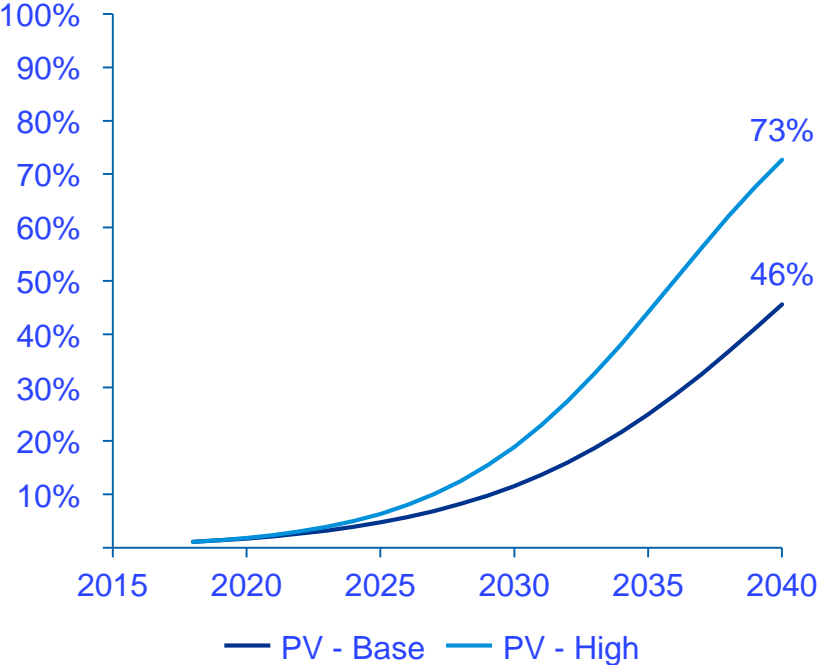


Source(s): Energy Information Administration (EIA); Bureau of Transportation Statistics (BTS)

KPMG Forecast Electric Vehicle Adoption

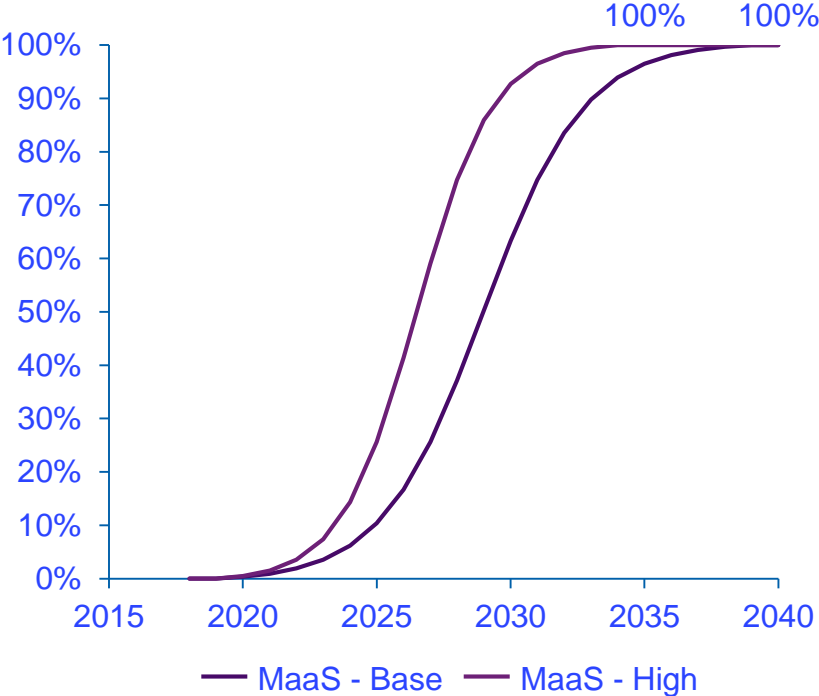
EV Adoption

Personally-owned Vehicles



EV Adoption

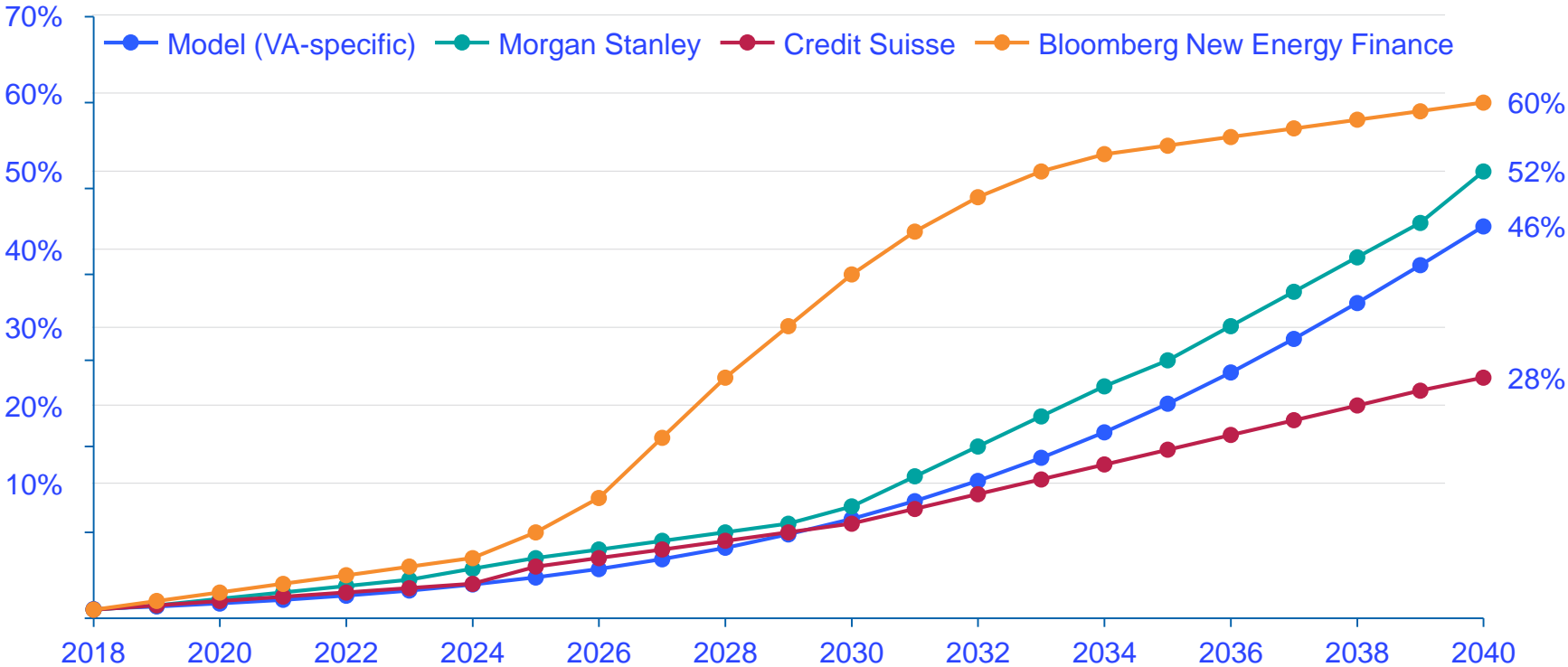
Mobility as a Service Vehicles



Note(s): Assumes 100% EV penetration for personal vehicles in 50-60 years and 15-20 years for MaaS vehicles, respectively
 Source(s): KPMG Analysis

Comparison of EV adoption rates

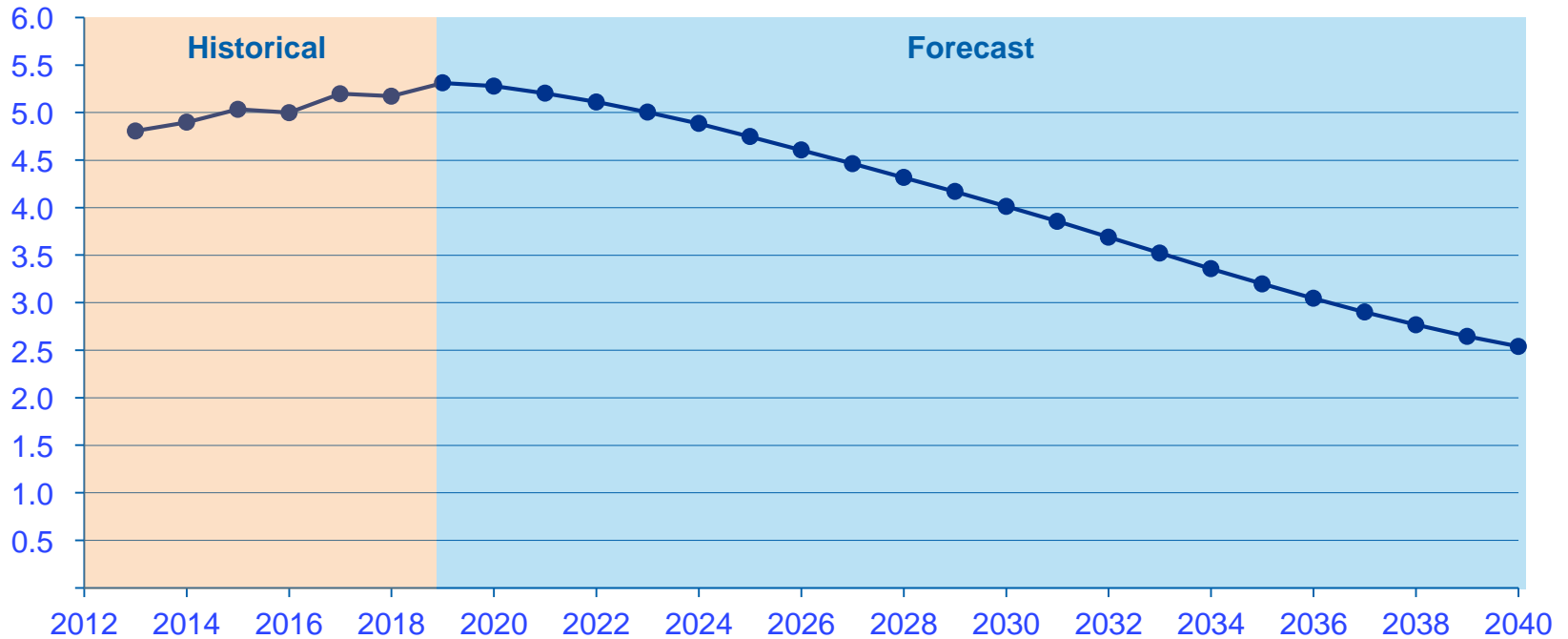
Electric Vehicle Adoption Estimates (Share of Sales)



Note: Model estimates are specific to Virginia; all others are U.S. National figures
 Source(s): Morgan Stanley Electric Vehicle Market Monitor (June 2019); Bloomberg New Energy Outlook (May 2019); KPMG Analysis

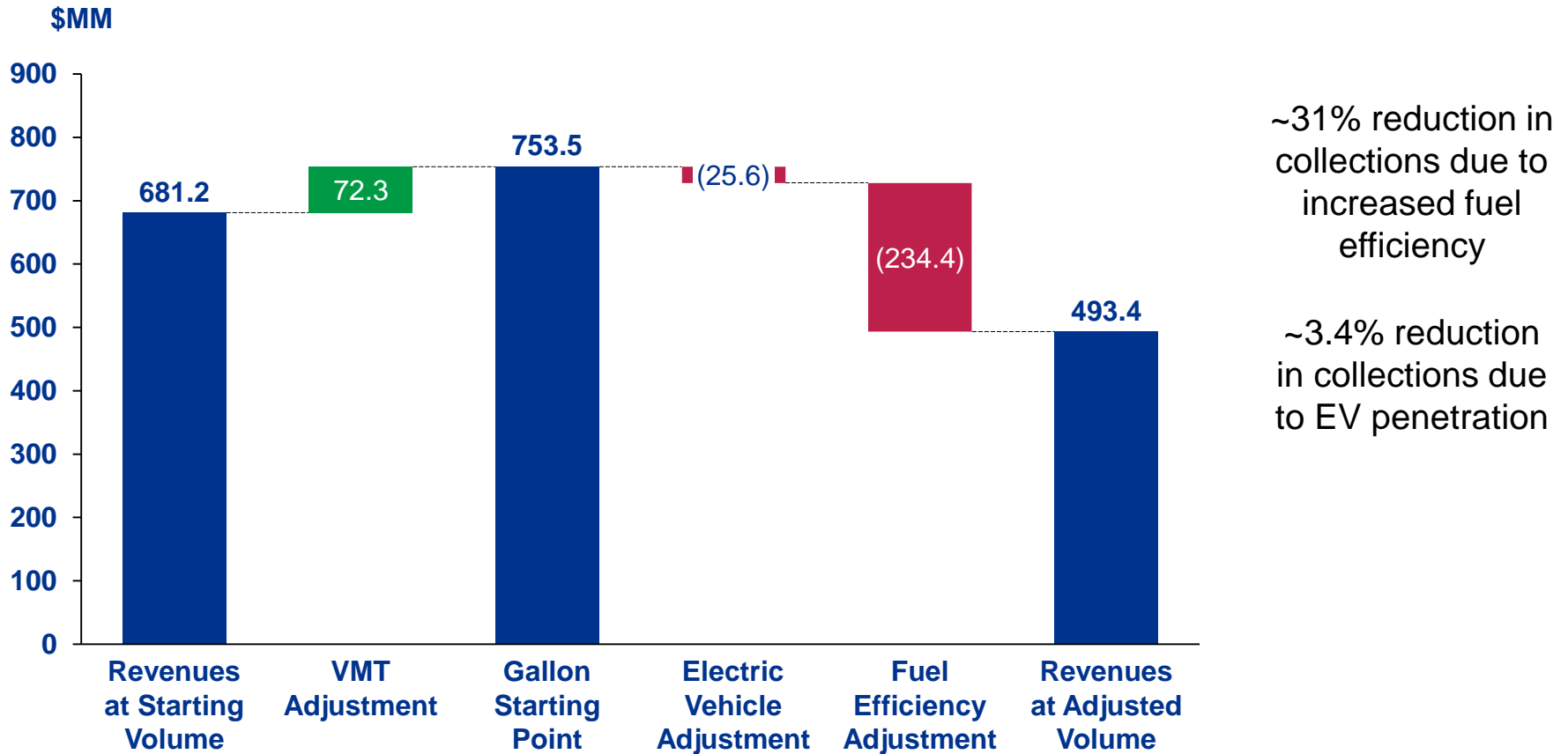
KPMG Forecast Fuel Consumption

Fuel Consumption
(Billion Gallons)



Notes: Includes both gasoline and diesel used for transportation
Source(s): Virginia DMV; KPMG analysis

KPMG Forecast Gas Tax Collections (2030)

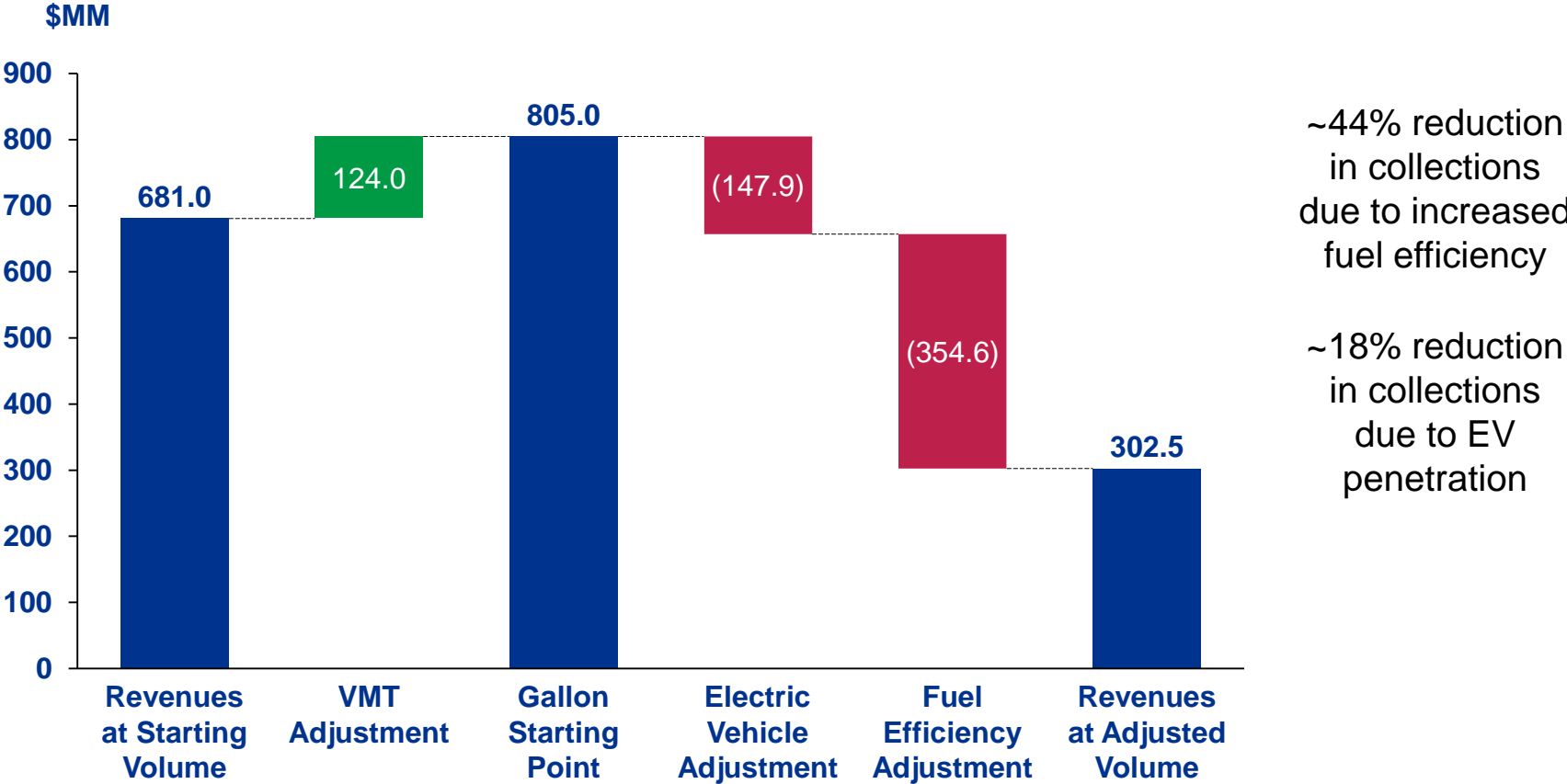


Source(s): KPMG Analysis



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KPMG Forecast Gas Tax Collections (2040)

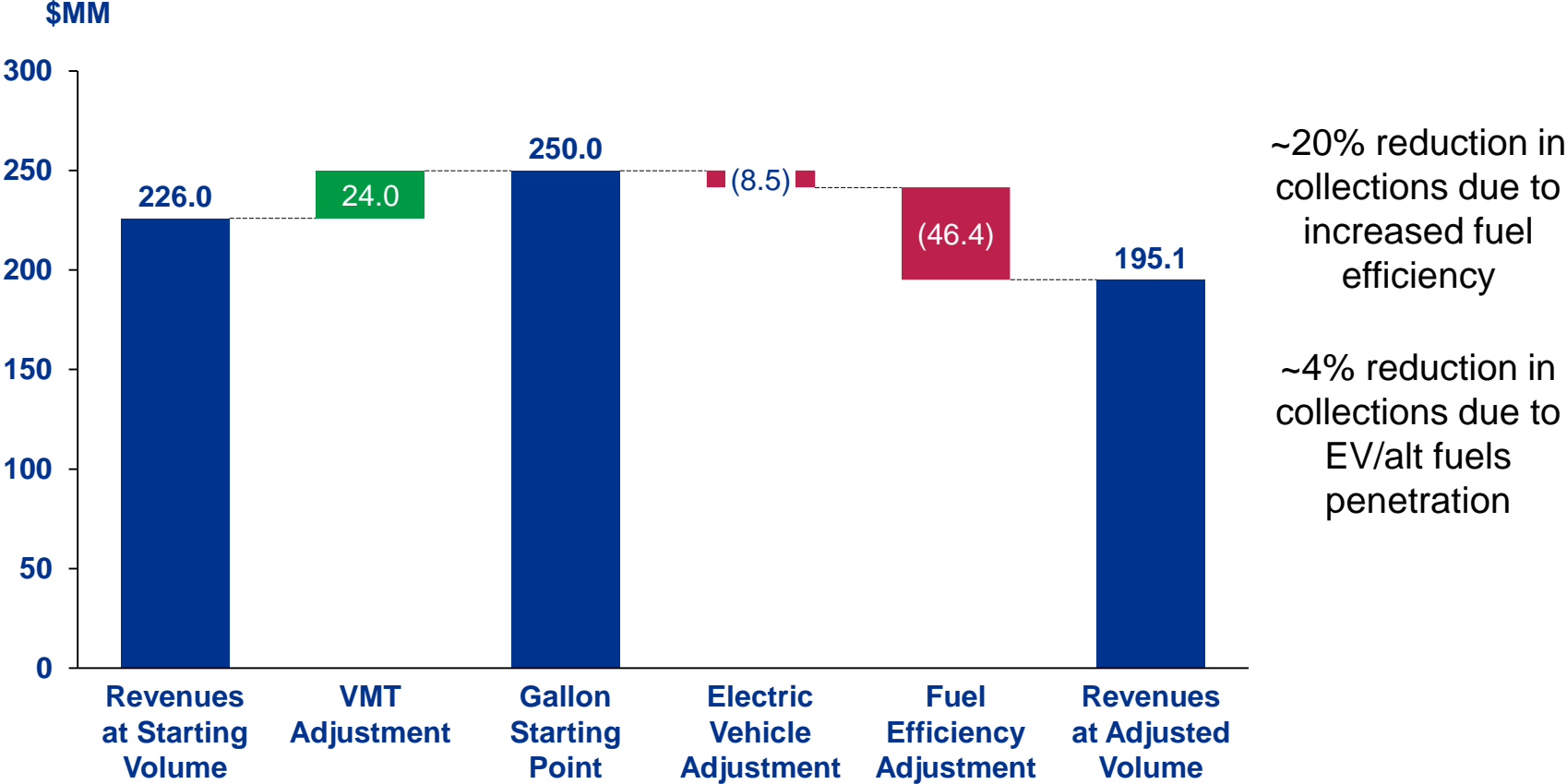


Source(s): KPMG Analysis



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KPMG Forecast Diesel Tax Collections (2030)

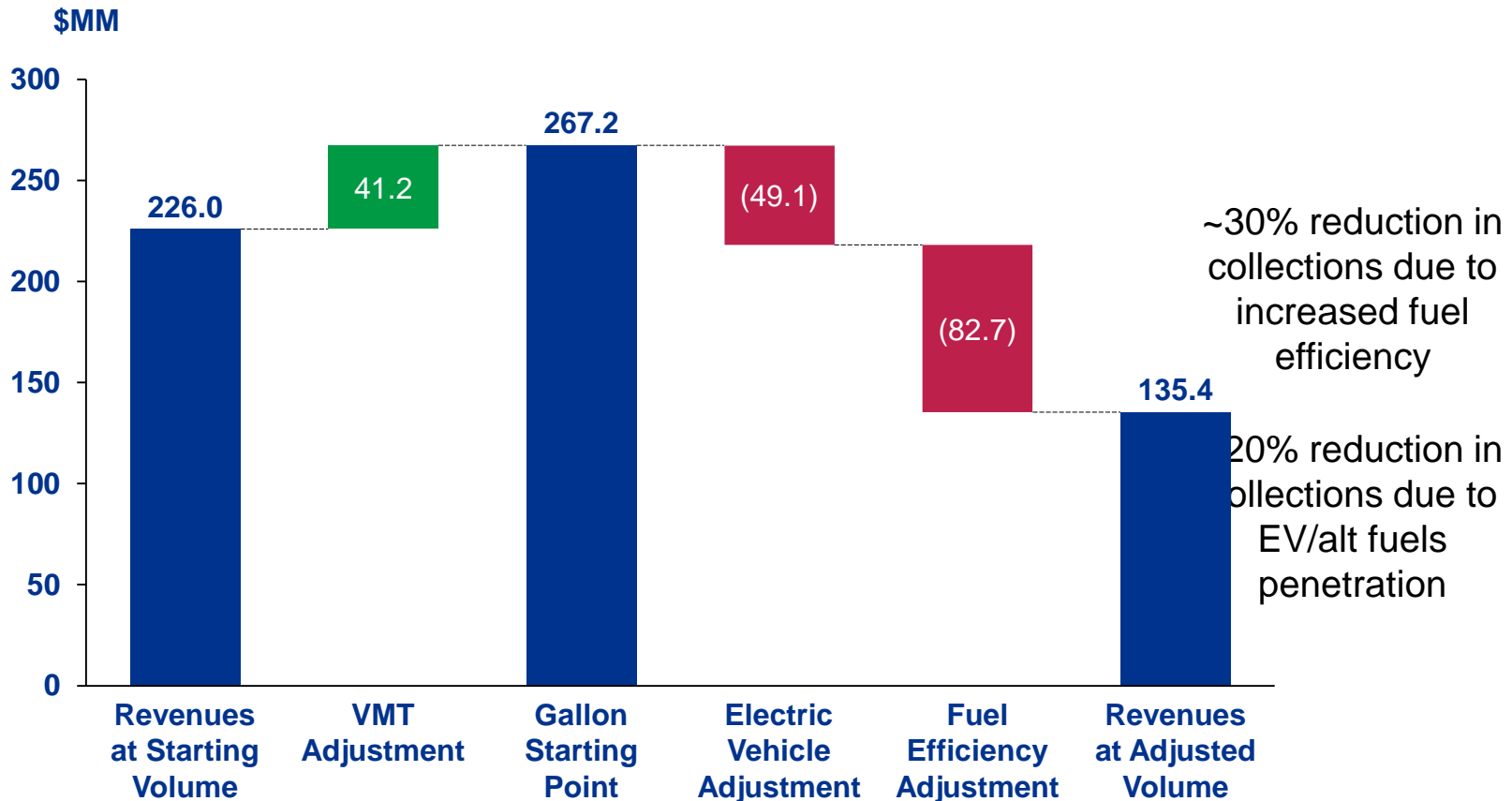


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KPMG Forecast Diesel Tax Collections (2040)



Source(s): KPMG Analysis



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Fuel Tax Collections

- **Greater near-term and mid-term risks from increased fuel efficiency**
- **Greater long-term risk from increased EV penetration into the fleet mix**
- **In 2030, fuel tax collections would be \$1,117MM if they grew at the same rate as inflation**

Fuel Efficiency Examples

Toyota Camry			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	23	\$ 81.70	-
2009	25	\$ 75.17	(8%)
2019	34	\$ 55.27	(32%)
2019 Hybrid	52	\$ 36.14	(56%)

Chevy Malibu			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	22	\$ 85.42	-
2009	23	\$ 81.70	(4%)
2019	29	\$ 64.80	(24%)

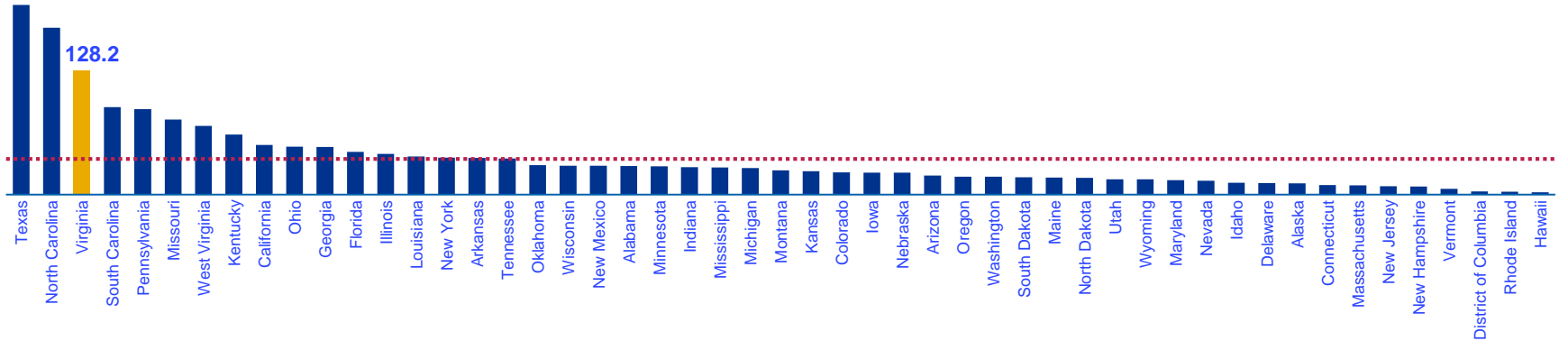
Hyundai Sonata			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	21	\$ 89.49	-
2009	24	\$ 78.30	(13%)
2019	28	\$ 66.32	(26%)
2019 Hybrid	42	\$ 44.74	(50%)

Ford F150 (2WD)			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	16	\$ 120.46	
2009	17	\$ 110.54	(8%)
2019	20	\$ 93.96	(22%)

Scope of Transportation Network

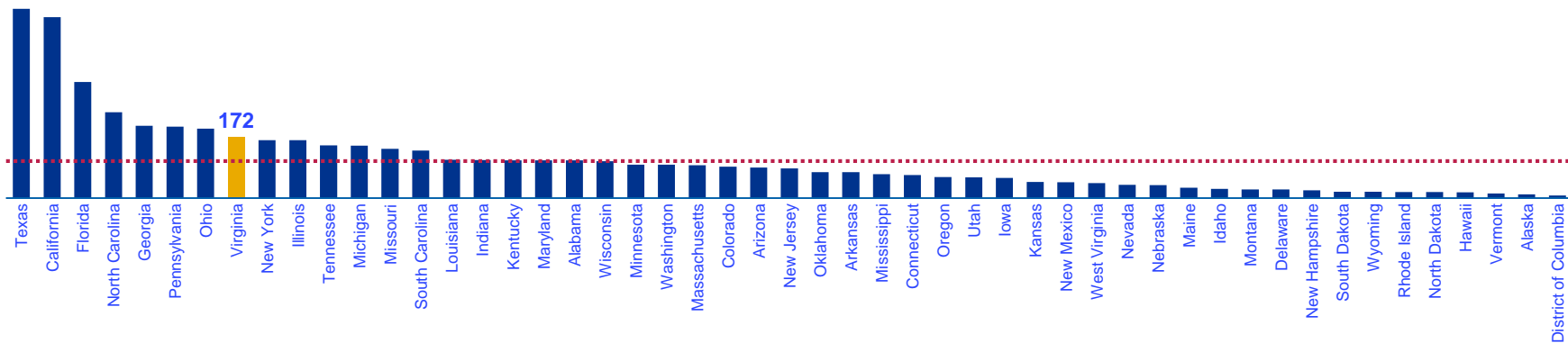
Average = 36,920 mi.

Agency-managed Lane Miles (in 000s of Lane Miles)



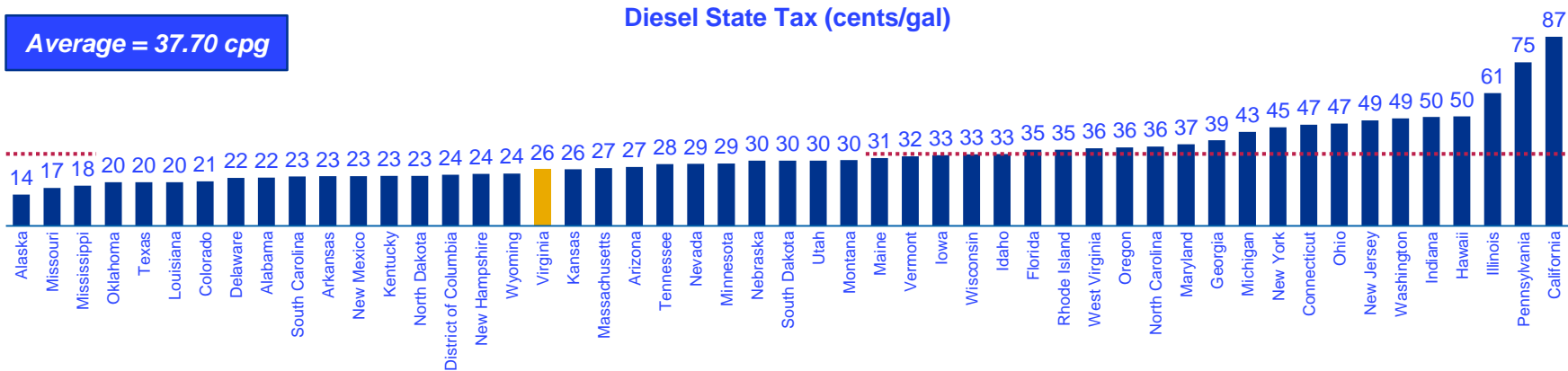
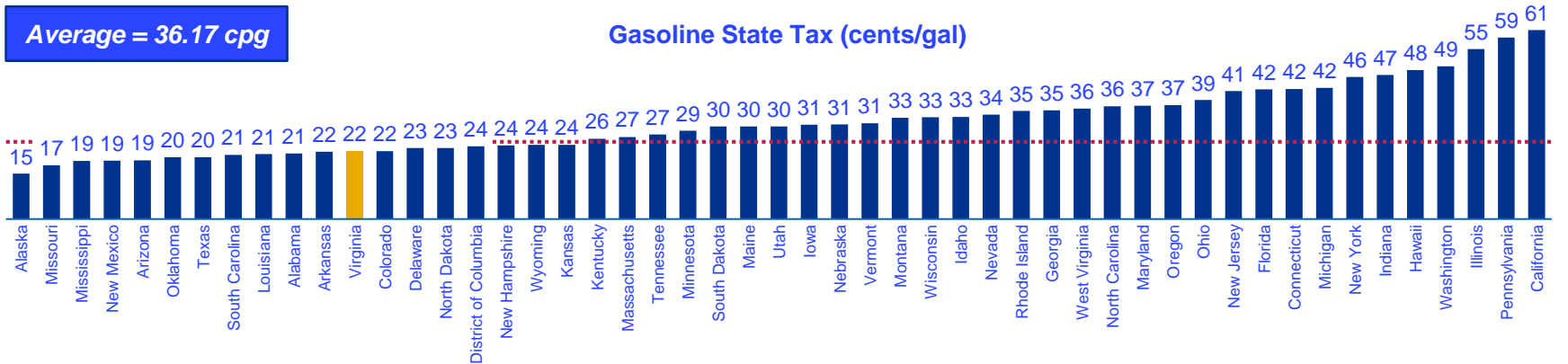
Average = 106 Million

Daily Vehicle Miles Traveled (in Millions of Miles)



Source: FHWA – 2017 data

Motor Fuels "Full" Tax Rates by State



Note: Average represents approximate volume-weighting
 Source: API - State Motor Fuel Tax Rates (effective as of 7/1/2019)

Funding Options (1 of 2)

Truck & Freight	Overweight Registration	<i>Registration based on vehicle weight and resultant impact on roadway; can be integrated into a VMT or other usage-based program</i>
	Weight-mile Tax	<i>VMT-based implementation of the program detailed above</i>
	Diesel Heavy Duty Fee	<i>VMT-based implementation of the program above, focused on diesel</i>
Other Mechanisms	Tire Tax	<i>Tax on sales of light-duty vehicle tires</i>
	Rental Car Tax	<i>Tax on rental cars</i>
	Hotel Occupancy Tax	<i>Tax on hotel occupancy (often referred to or integrated with a "tourism tax")</i>
	Vanity Plate Fees	<i>Fee for getting a personalized license plate for a vehicle</i>
	Container Tax	<i>Fee related to the handling and movement of large containers; typically discussed as funds earmarked for freight and port investment</i>
	Inspection Fees	<i>Fee to inspect vehicle for basic safety and/or environmental compliance</i>
	Drivers License Surcharge	<i>Fee for administering and providing drivers licenses to vehicle operators</i>
	Harbor Maintenance Tax	<i>Similar to customs duties and fees; would tax passenger tickets and some classifications of commercial cargo</i>
	Income Tax Fees	<i>Ring-fenced portion of income or payroll tax dedicated to transportation</i>
	Vehicle Age Fee	<i>Variable fee contingent on vehicle model year from date of annual registration</i>

Funding Options (2 of 2)

Consumption	Fuel Sales Tax	<i>Percentage-based tax on sales of motor fuels</i>
	Fuel Excise Tax	<i>Volume-based tax on sale of motor fuels</i>
	Road Pricing/Tolls	<i>Based on use of designated road segments</i>
VMT-based	Road User Charges	<i>Also referred to as VMT or MBOF; a distance-based usage charge</i>
	VMT Emissions	<i>Add-on fee for CNG/LPG vehicles</i>
	Real-time Electronic Charges	<i>Checkpoint-based charges, similar to tolling</i>
Emerging Businesses + Modes	Electric Vehicle / High Efficiency Fees	<i>Registration fee for low/no gasoline-usage vehicles</i>
	Alternative Fuel Decal Fee	<i>Fee for alternative fuel vehicles to access public charging, etc.</i>
	Ride-hailing / Carsharing Fees	<i>Fees for on-demand transportation such as Uber or Lyft</i>
	Home Rental Fees	<i>Fee for utilizing services such as VRBO or Airbnb</i>
	E-commerce Fees	<i>Fee for services generating deliveries (e.g., Amazon) or with similar approaches to historical business types (e.g., Travelocity)</i>
	Bicycle Fees	<i>Fee for purchase or registration of bicycles or similar vehicles</i>
Value Capture	Assessment / Development Fees	<i>Special charges on properties/parcels in close vicinity to newly improved transportation or other agency-owned assets</i>
	Retail Sales Tax	<i>Dedicated transportation portion of retail sales tax on goods</i>
	Vehicles Sales/Transfer Tax	<i>Tax on new vehicle sales or title transfers</i>
	Minerals-Related	<i>Taxes on mineral and natural resource related products, such as oil and gas production or import</i>
	Destination Fees	<i>Fees related to designated destinations (parks, beaches, etc.) that drive significant vehicle mileage</i>

Funding Context

Illustrative Selection

	Motor Fuels	Tourism	Natural Resources	HOT / Tolls	Vehicle Fees	General Sales	Other
Virginia	X			X	X	X	
Arkansas	X		X		X	X	<i>Natural gas severance</i>
Colorado	X			X	X		<i>Rental vehicles</i>
Florida	X				X		<i>Aviation fuels, rental cars</i>
Georgia	X	X					<i>Hotel taxes</i>
Kansas	X			X	X	X	<i>Property sales</i>
Maine	X				X		<i>Liquor distribution</i>
Maryland	X		X		X		<i>Corporate income taxes</i>
Massachusetts	X	X		X	X		<i>Gaming Revenues</i>
North Carolina	X				X		<i>Title/ vehicle transfer (3%)</i>
South Carolina	X			X			<i>Title/ vehicle transfer (5%)</i>
Texas	X		X	X	X		<i>Lubricants tax, oil & gas</i>
Utah	X			X	X	X	<i>General Retail Tax</i>

Source: BATIC/AASHTO "50 States Report"; state published information

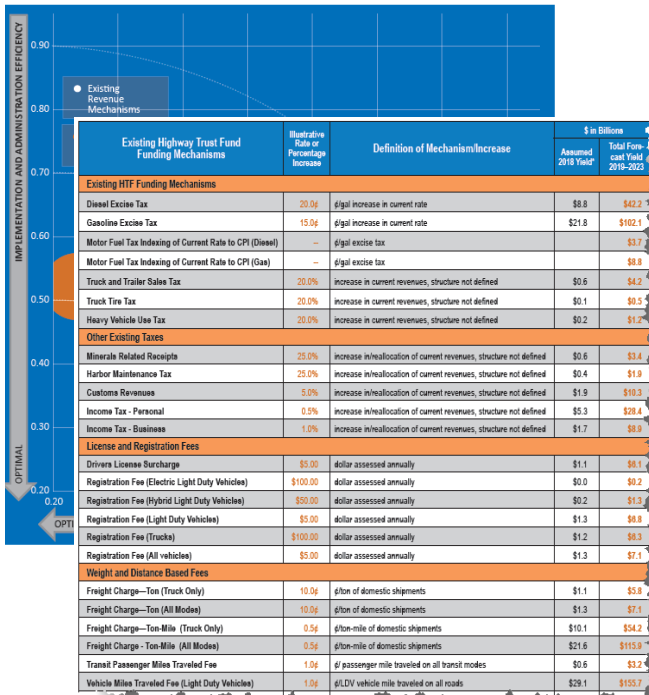
What about who pays now?

Revenue Source	Virginians	Out-of-State Users	Percentage of CTF Revenues
Gasoline Tax	Yes (~83%)*	Yes (~17%)	24.8%
Diesel Tax	Yes (~49%)*	Yes (~51%)	
Vehicle sales	Yes	No	27.4%
Retail sales	Yes (80%+)	Yes (> 20%)	30.3%
Registration fee	Yes	No	7.6%
IRP	Yes	Yes	1.9%
Insurance Prem.	Yes	No	4.9%
Misc.	Yes	No	3.1%

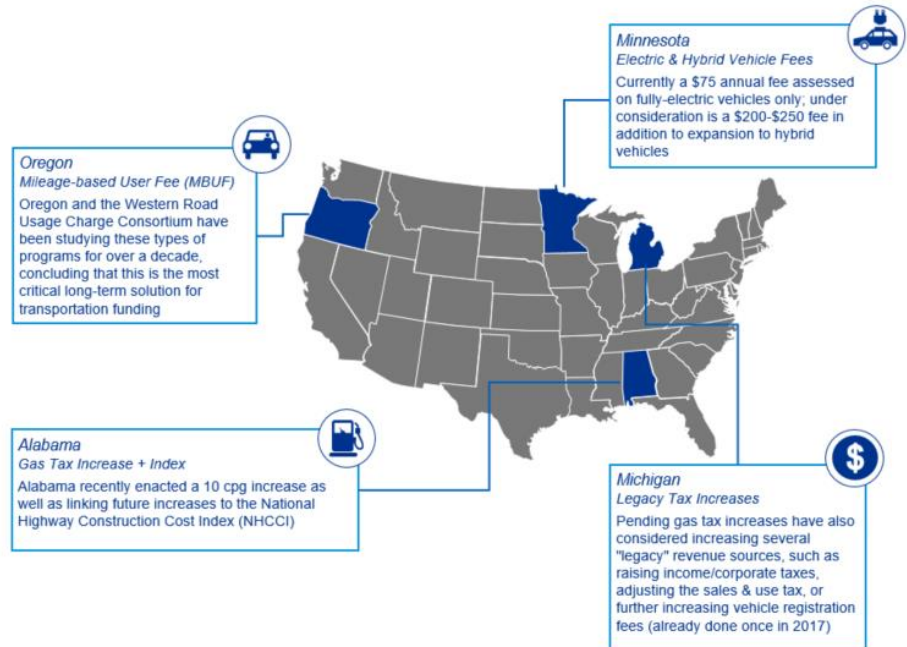
* Based on estimate

Developing a Catalog of Funding Options

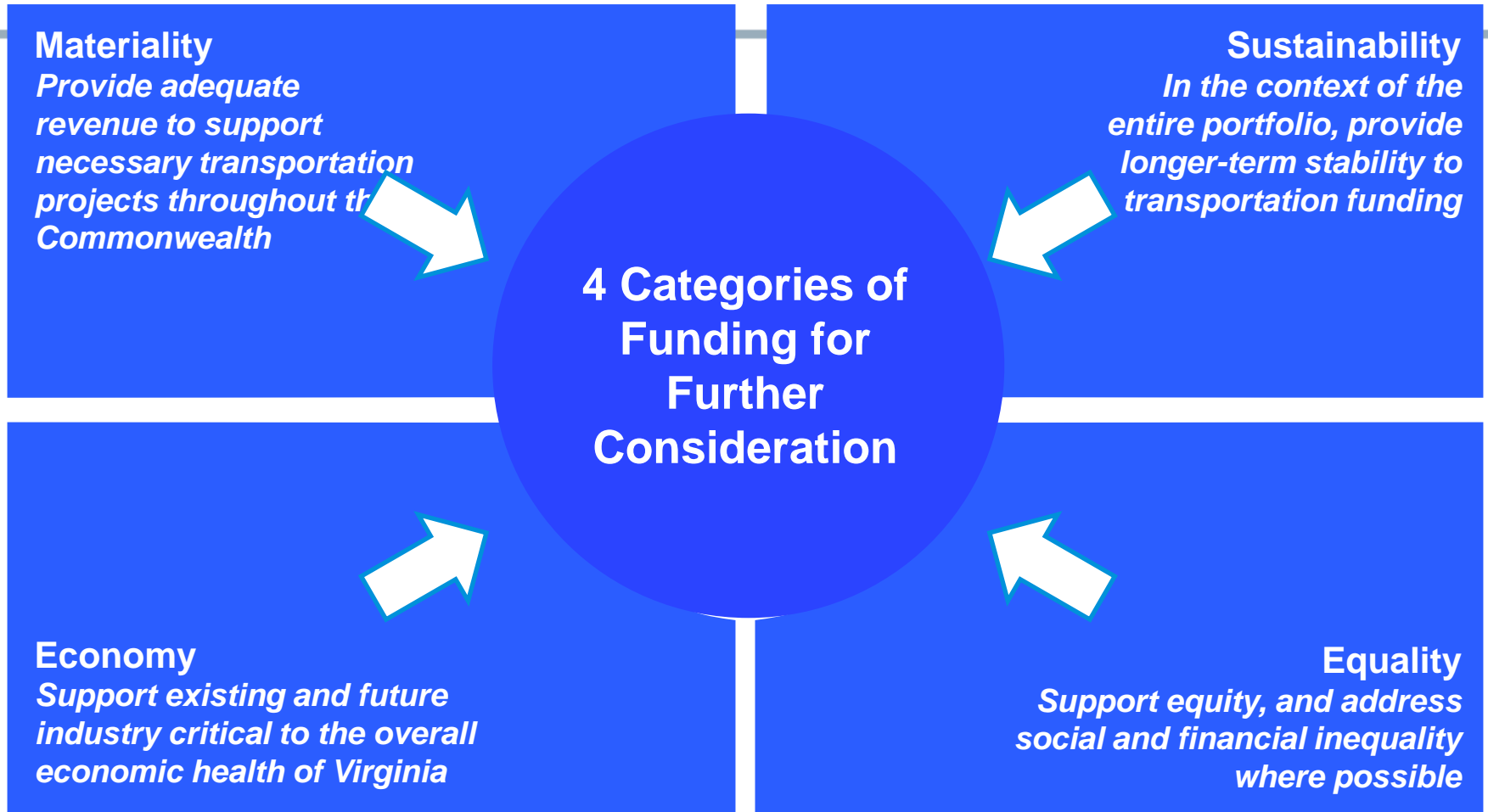
AASHTO Transportation Revenue Options (2019)



Review of Measures Other States Are Considering



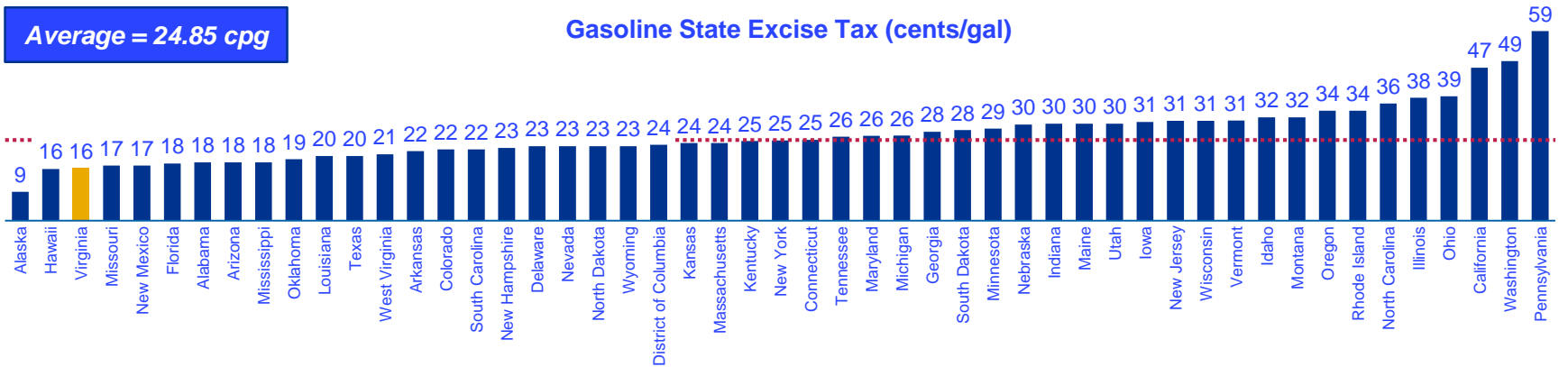
Design Principles



Motor Fuels Excise Tax by State

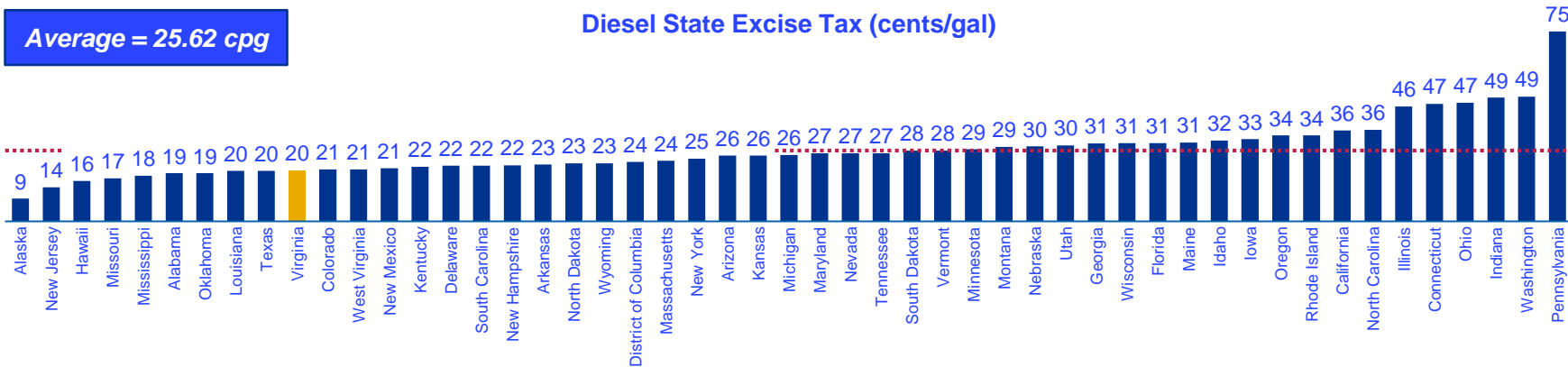
Average = 24.85 cpg

Gasoline State Excise Tax (cents/gal)



Average = 25.62 cpg

Diesel State Excise Tax (cents/gal)

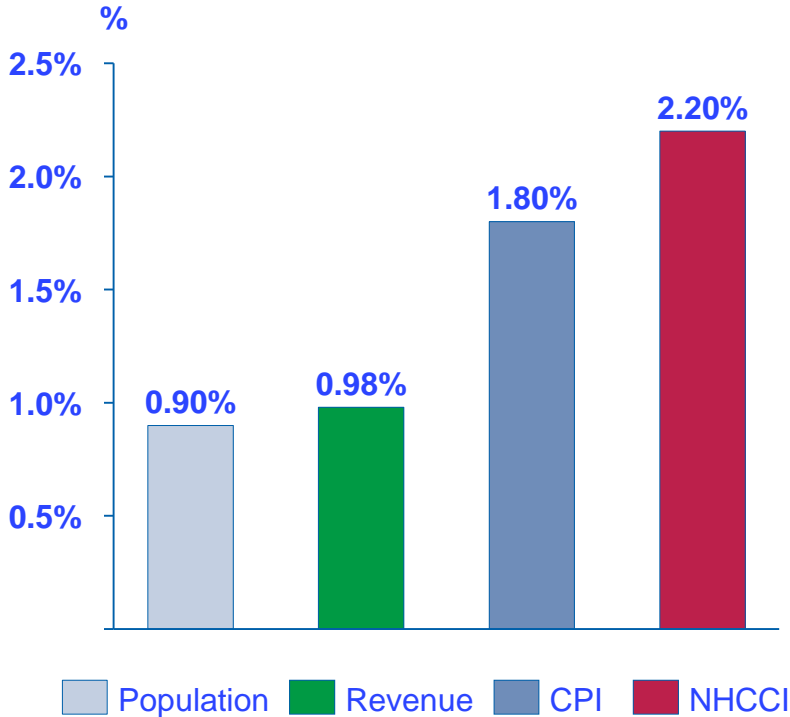


Note: Average represents approximate volume-weighting

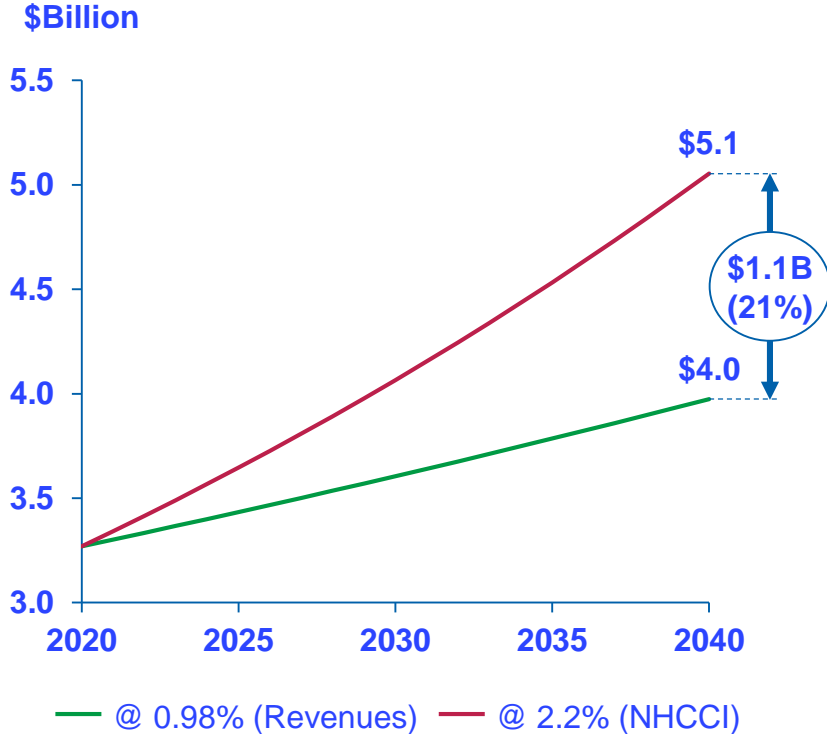
Source: API - State Motor Fuel Tax Rates (effective as of 7/1/2019)

Comparison to Expenditure Growth Rates

Forecasted Revenue vs. 10-Yr Historical Growth Indices^(a)



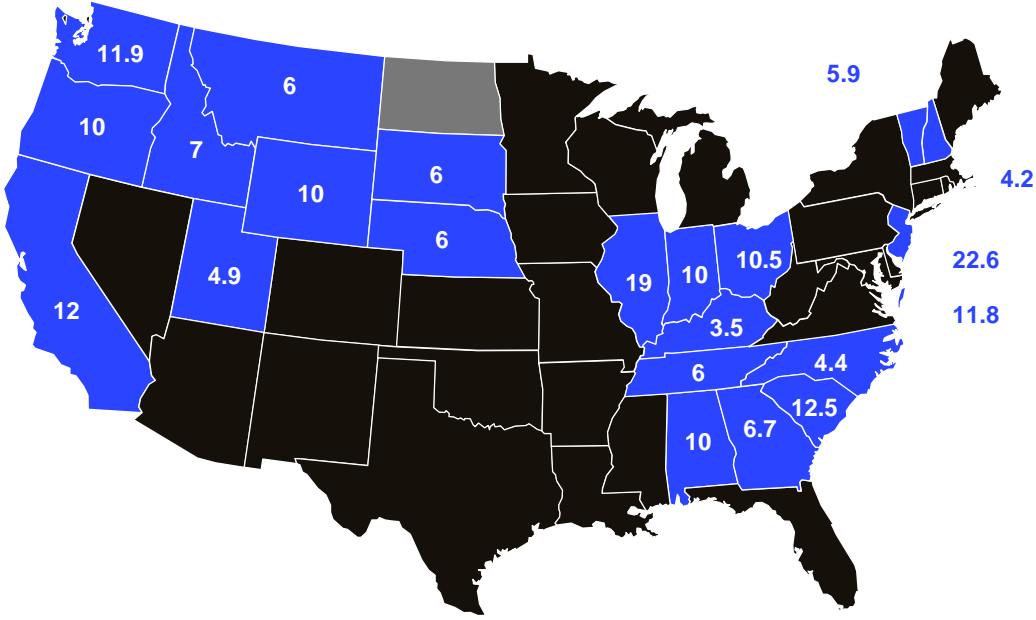
Notional Growth Rate Over time



Note(s): (a) All indices are CAGRs
 Source(s): VDOT; Federal Highway Administration; Bureau of Labor Statistics; Statista; KPMG Analysis

Recent Motor Fuels Tax Increases

Major Increases in Motor Fuel Taxes Since 2013



Average increase since 2013 has been approximately 10

Note: Includes only states with significant increases enabled by discrete legislative measures
Source: National Conference of State Legislatures

States with Variable Fuel Taxes

Inflation-based Index		
State	Gas Tax + Fees (cpg)	Index Type
Alabama	21.21	National Hwy Construction Cost Index
California	55.18	State Inflation Rate
Florida	37.99	Consumer Price Index (CPI)
Georgia	35.28	Vehicle Fuel Efficiency and CPI
Indiana	42.90	State Inflation Rate
Maryland	35.30	Gasoline Prices and CPI
Michigan	42.86	State Inflation Rate
North Carolina	36.45	Population Growth and CPI
Rhode Island	34.00	Consumer Price Index
Utah	30.01	Gasoline Prices and CPI

Price or Spend-based Index		
State	Gas Tax + Fees (cpg)	Index Type
Arkansas	21.80	Gas Prices
Connecticut	36.85	Gas Prices
Hawaii	46.76	General Sales Tax
Illinois	36.87	General Sales Tax
Kentucky	26.00	Gasoline Prices
Nebraska	30.50	Gas Prices and State Spending
New Jersey	41.40	Gas Prices / Revenue Collection
New York	45.35	Gas Prices
Pennsylvania	58.70	Gas Prices
Vermont	30.46	Gas Prices
Virginia	21.95	Gas Prices
West Virginia	35.70	Gas Prices

Source(s): National Conference of State Legislatures and American Petroleum Institute Estimates as of 7/1/19

Current and Proposed Efforts with Transportation Network Companies

Fee on Total Trip Cost

Entity	Type	Amount
Alabama	Variable	1%
District of Columbia	Variable	6%
Nevada	Variable	3%
Rhode Island	Variable	7%
South Carolina	Variable	1%
South Dakota	Variable	4.5%
Wyoming	Variable	4%

Per-ride Fees

Entity	Type	Amount
Chicago	Fixed	\$0.72 / ride
Connecticut	Fixed	\$0.25 / ride
Maryland	Fixed	\$0.25 / ride
Massachusetts	Fixed	\$0.20 / ride
New Orleans	Fixed	\$0.50 / ride
New York (Manhattan)	Fixed	\$2.75 / ride
Portland	Fixed	\$0.50 / ride
Seattle	Fixed	\$0.24 / ride

Annual TNC Direct Fee

Entity	Type	Amount
Arkansas	Fixed	\$15,000 / year
Colorado	Fixed	\$111,250 / year
Kentucky	Variable	\$280 / vehicle

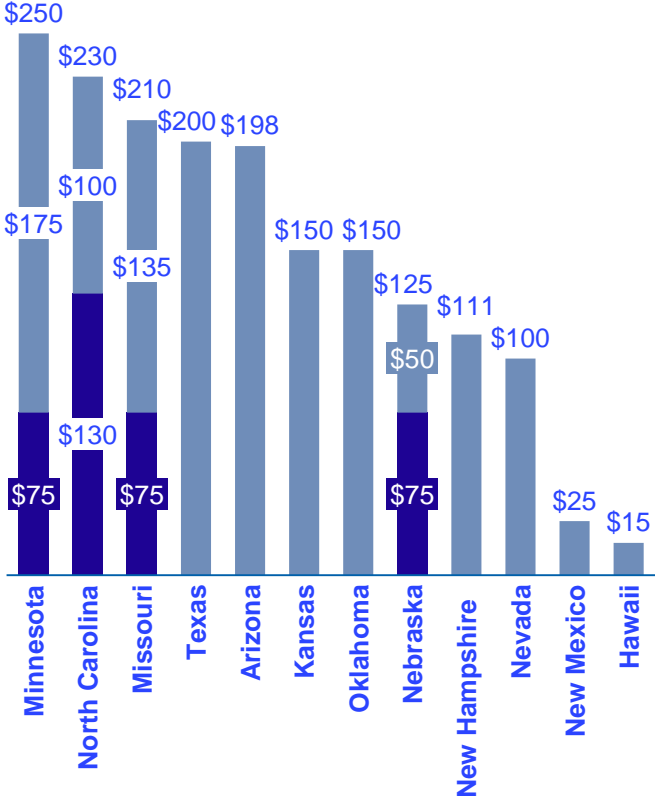
Proposed/Pending

Entity	Type	Amount
Georgia	Variable	7-9%
Los Angeles	Variable	3.25%
Pennsylvania	Fixed	\$1.00 / ride
San Francisco	Variable	3.25%

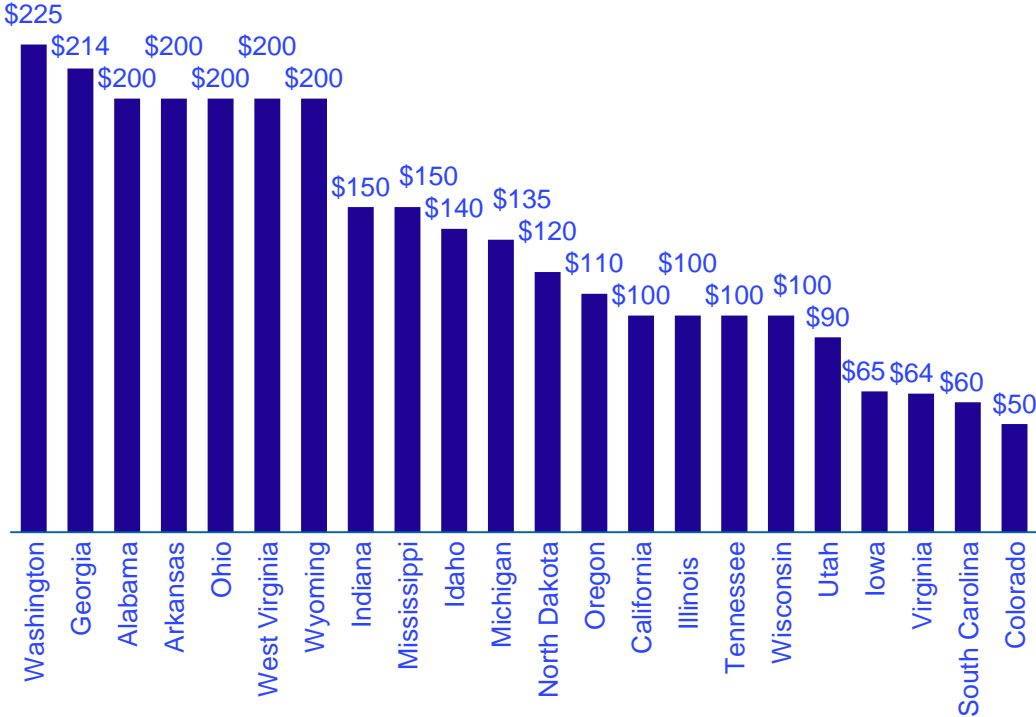
Source(s): Websearches; TNC Policy Guide – State of Washington, 2019

Current & Proposed Electric Vehicle Registration Fees

States w/ Existing and/or Proposed Fees



States w/ Fees in Place (No Active Changes Proposed)



Legend: Proposed (light blue), Existing (dark blue)

Source(s): NCSL; Consumer Reports EV Fee Analysis

Utah | *Road Usage Program*

Program Description	<i>In January 2020, UDOT will launch a voluntary road usage charge program for all alternative fuel vehicles</i>
Participants	<i>All alternative fuel vehicle (EV, PHEV, and gas hybrid) owners are eligible representing approximately 2% of statewide vehicle fleet or approximately 45,000 vehicles</i>
Data Collection	<i>(1) OBD-II GPS Plug-in device (2) Smart-phone based odometer reading</i>
Fee Rate(s)	<i>A per-mile fee at a rate to be determined; total annual fees capped at the amount of annual vehicle fee (\$120 indexed to CPI for electric vehicles)</i>
Status & Next Steps	<i>UDOT intends to initiate the program in January 2020 as directed in SB 136 passed in 2018</i>
Key Learnings	<ul style="list-style-type: none"> ▪ <i>Providing citizens with choices was a key design element</i> ▪ <i>Initial program may be scaled to include additional functionality (e.g., out-of-state travel) or additional vehicle types</i> ▪ <i>People with privacy concerns may opt for limited data retention or simply pay the fixed annual fee</i>





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Thank you.

