LDV Demand Forecast Inputs, Assumptions & Scenarios

2023 Integrated Energy Policy Report Workshop on California Electricity Demand Forecast

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Forecast & Scenarios

Two Types of future path for light duty vehicles (LDV)

- Baseline demand **Forecast** is based only on all baseline input forecasts of:
  - ➤ Economic & demographic variables
  - ➤ Vehicle attributes
  - ➤ Fuel prices
  - ➤ Incentives

- AATE **Scenarios**
  - ➤ **Fleet Population**: same as in the baseline forecast.
  - ➤ **Fleet Composition**: Overwrites baseline forecast and <u>assumes</u> the same ZEV market share as projected in CARB's ACC2.

Both the forecast and the scenarios <u>assume</u> the same vehicle miles traveled (VMT) for all vehicles, regardless of <u>fuel type</u>.

Vehicle Population, Fuel economy, and VMT determine transportation fuel demand, including transportation electricity consumption.

Key Inputs for Baseline LDV Forecast

LDV Population

- Household population
- Household Income

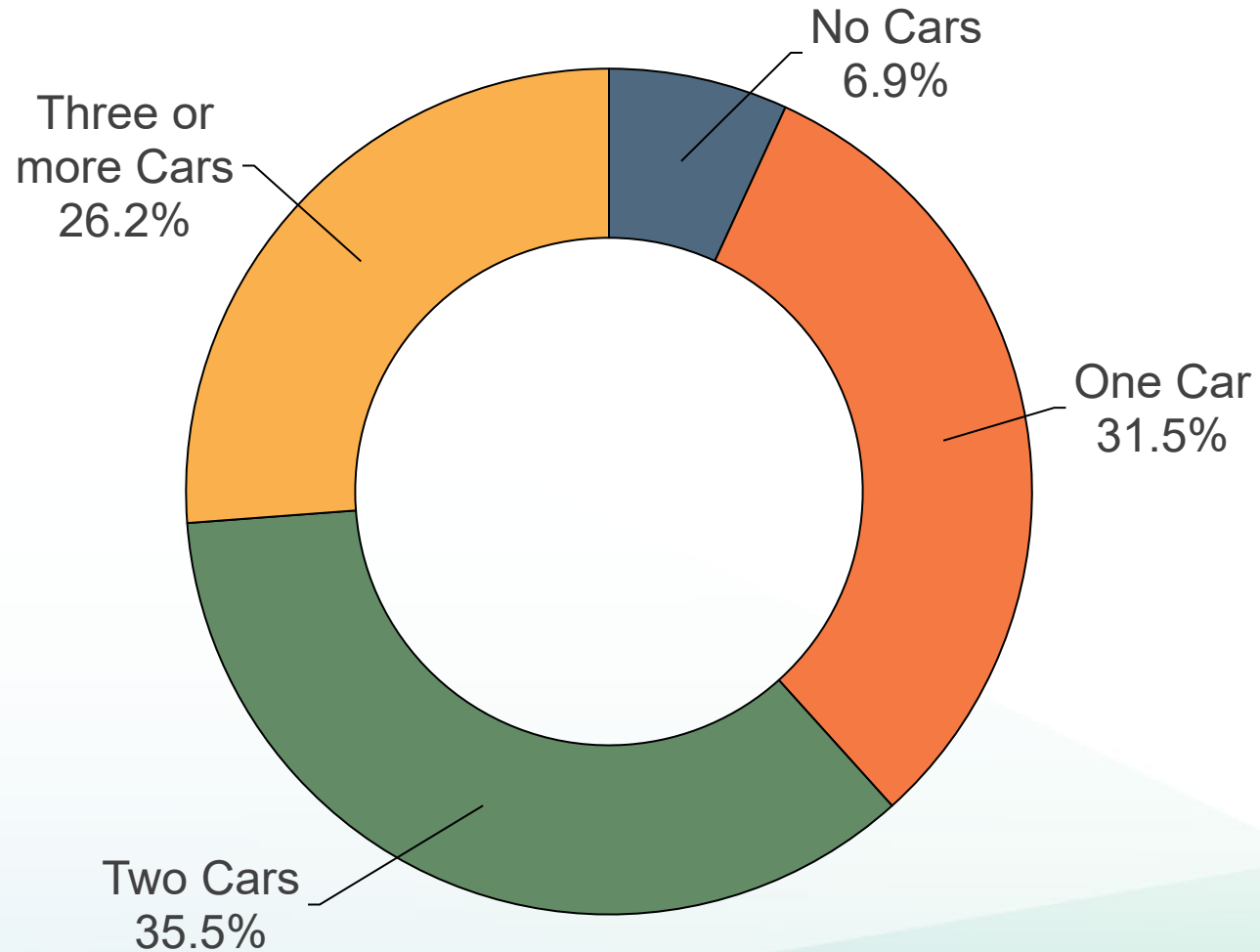Gross State Product forecast used for non-residential LDV forecast.

LDV Fleet Composition (Fuel Type & class)

- Vehicle Attributes (vehicle prices, MPG, Range, cost per mile …)
- Incentives (State Rebate, Clean Fuel Rewards, IRA Federal Tax Credits)

Vehicles in Household (2021)

Vehicle Ownership by Household Income (2021)
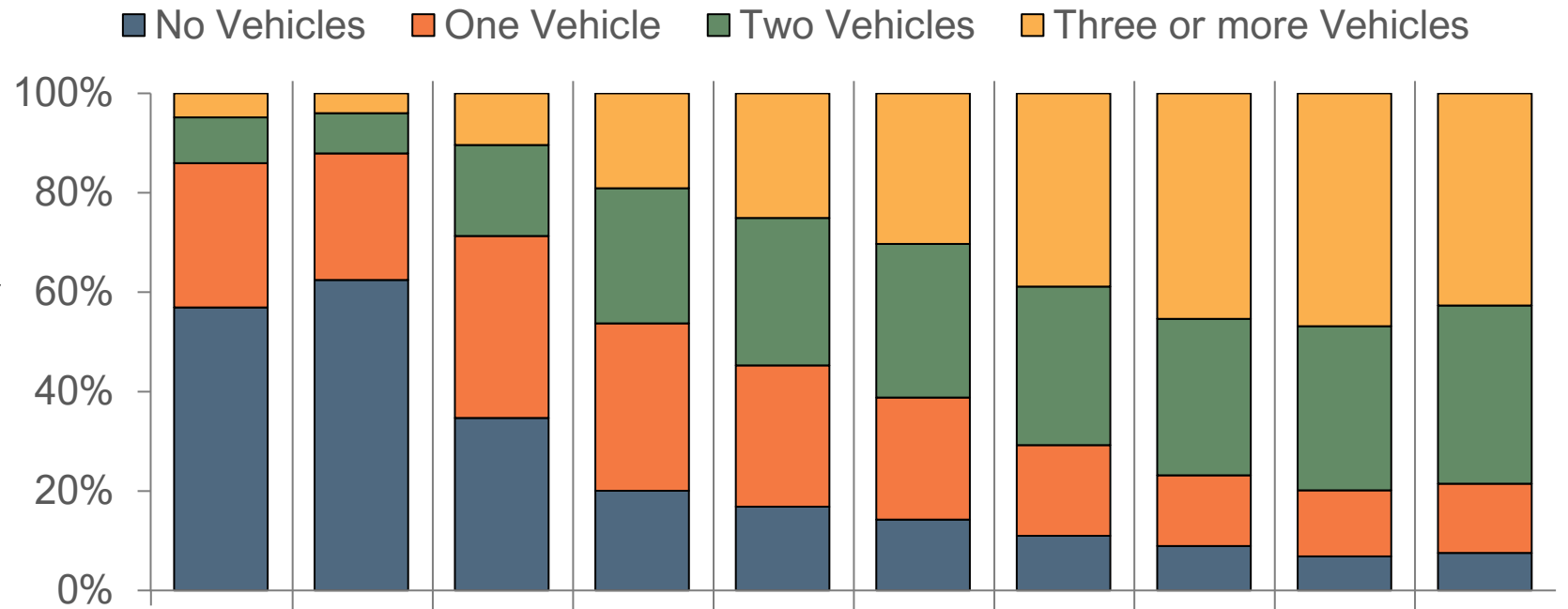
Household Income Distribution (2021)

Legend: No Vehicles, One Vehicle, Two Vehicles, Three or more Vehicles

Income categories: $0k-$10k, $10k-$20k, $20k-$40k, $40k-$60k, $60k-$80k, $80k-$100K, $100k-$150K, $150k-$200K, $200k-$250K, $250k+
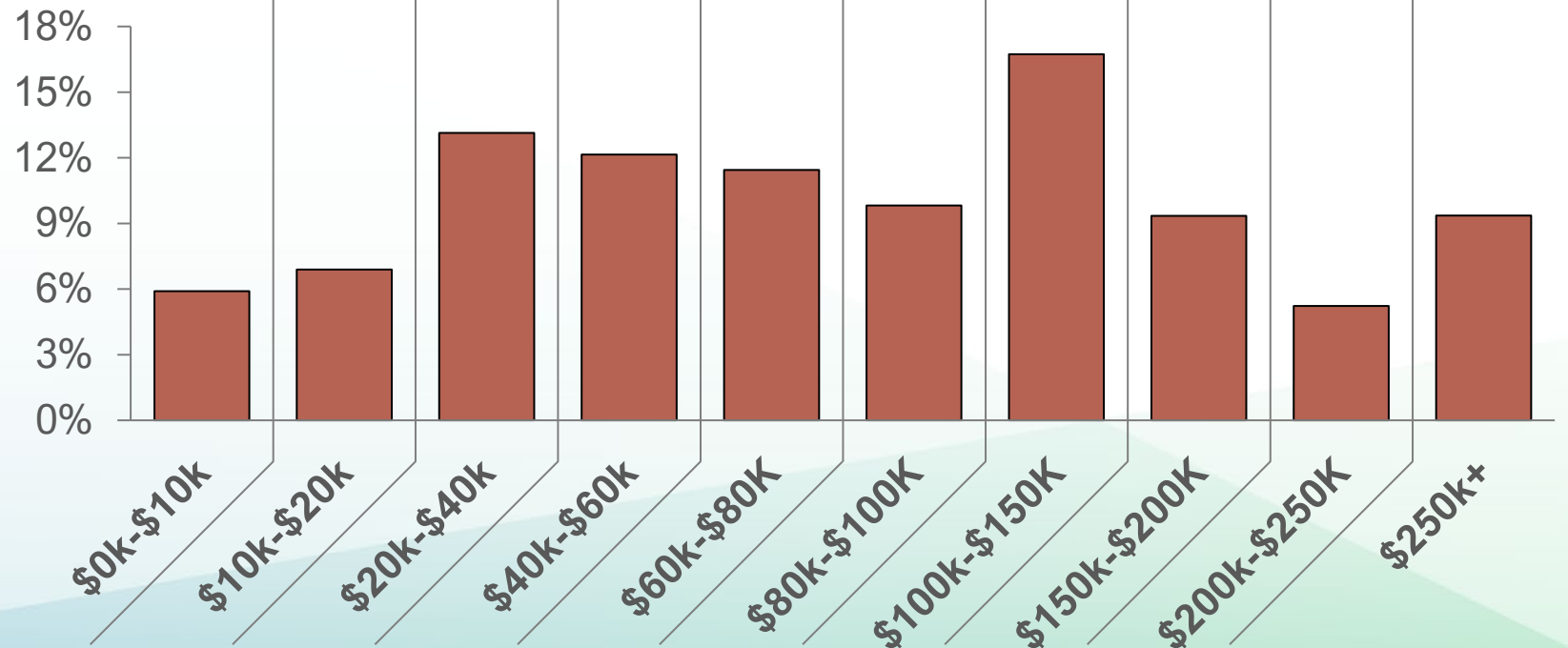
Source for Both Charts: Energy Commission Staff Analysis of 2021 American Community Survey

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Household Population in California

Personal Income (2022 Dollars)

+$1.4T (2023-2040)

Trillion Dollars

$5.0
$4.5
$4.0
$3.5
$3.0
$2.5
$2.0
$1.5
$1.0
$0.5
$0.0

$3.1T
$3.3T
$3.7T
$4.1T
$4.5T

2020   2022   2024   2026   2028   2030   2032   2034   2036   2038   2040

Source: Moody's Analytics
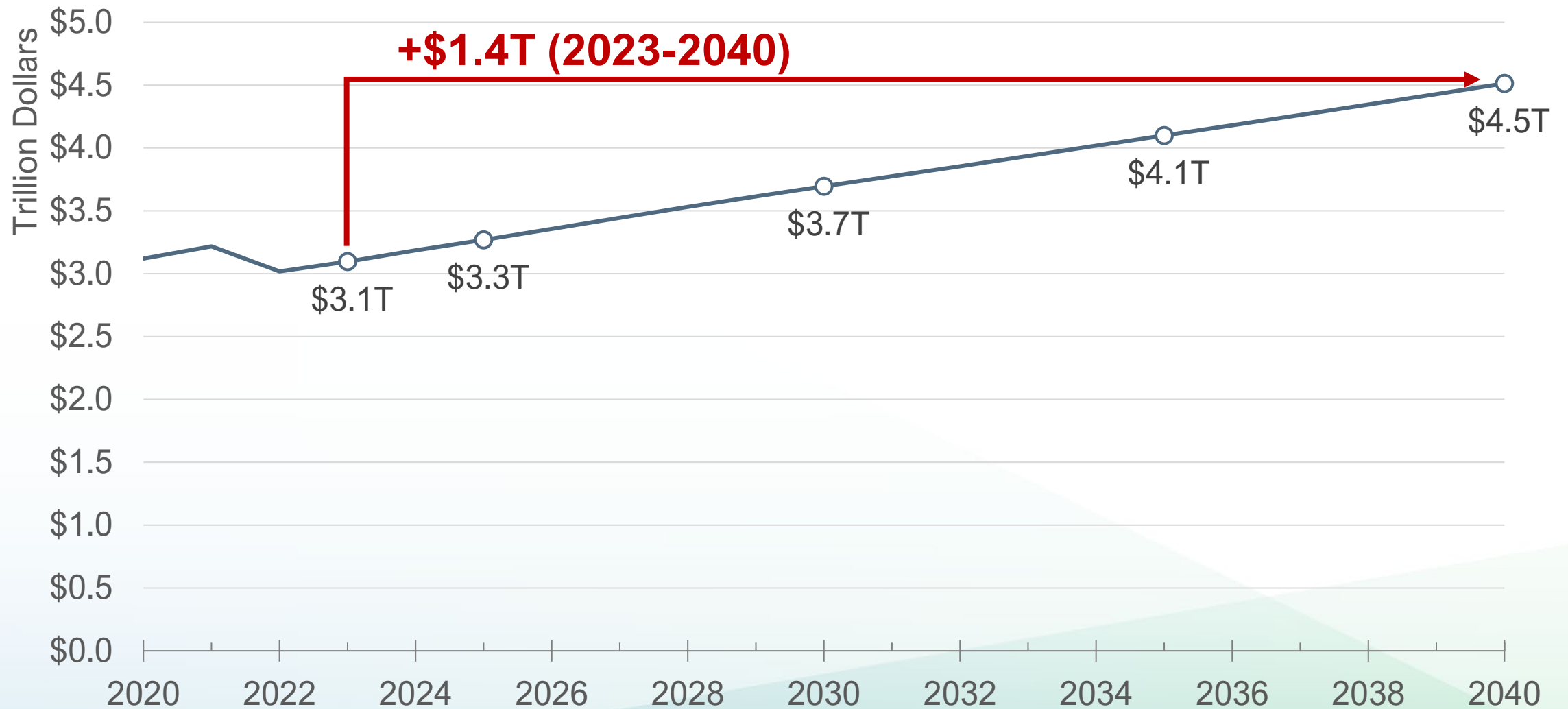
Vehicle Attributes

- Vehicle attributes and incentives determine the <u>class</u> and <u>fuel type composition</u> of the light-duty vehicle demand forecast.

- Attributes include price, fuel economy, range, acceleration, maintenance costs, and fuel cost per mile (determined by both fuel economy and fuel prices).

- While all these attributes have significant impact on the choice of vehicles, price is a primary factor.

- Our forecast only accounts for state and federal incentives.

2022 Market Share by Class (All Fuel & Technology Types)

Class	Standard	Premium
Car-Compact	8.8%	1.9%
Car-Large	0.6%	1.5%
Car-Midsize	13.1%	2.2%
Car-Sport	1.8%	0.8%
Car-Subcompact	0.5%	0.0%
Pickup-Compact	4.1%	0.0%
Pickup-Heavy	1.7%	0.0%
Pickup-Std	6.7%	0.1%
SUV-Compact	14.3%	12.3%
SUV-Large	2.0%	0.9%
SUV-Midsize	13.2%	3.6%
SUV-Subcompact	6.1%	0.6%
Van-Heavy	1.3%	0.0%
Van-Minivan	0.9%	0.4%
Van-Std	0.3%	0.0%
All Classes	75.6%	24.4%

Source: Staff analysis of 2022 DMV Data

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MSRP Trend by Class and Fuel Type, for Standard Vehicles (Population Weighted): Car and Pickup

Gasoline-Powered Standard Vehicles

Class	2019	2020	2021	2022	2023*
Car-Compact	21,498	21,758	22,153	23,196	22,281
Car-Large	34,927	35,909	38,092	38,923	33,845
Car-Midsize	24,463	26,261	28,010	28,583	28,590
Car-Sport	35,646	35,607	39,494	39,974	52,934
Car-Subcompact	17,637	18,557	18,058	20,195	31,520
Pickup-Compact	32,566	34,968	36,457	35,886	40,367
Pickup-Heavy	40,662	45,599	45,775	50,907	43,867
Pickup-Std	41,879	40,835	42,433	47,515	50,543

Battery Electric Standard Vehicles

2019	2020	2021	2022	2023*	Coming
35,648	37,801	37,751	31,669	29,999	-
-	-	-	-	-	(2026)
47,613	42,912	42,518	54,480	41,646	-
-	-	59,900	49,510	53,366	-
30,742	29,900	29,900	29,900	33,900	-
-	-	-	-	-	(2025)
-	-	-	-	-	(2026)
-	-	-	68,922	64,474	-

MSRP Trend by Class and Fuel Type, for Standard Vehicles (Population Weighted): SUV and Van

Gasoline-Powered Standard Vehicles

Class	2019	2020	2021	2022	2023*
SUV-Compact	28,272	28,076	28,829	30,130	32,375
SUV-Large	56,512	52,053	55,581	61,522	57,658
SUV-Midsize	36,844	37,749	39,583	40,110	40,138
SUV-Subcompact	24,881	22,812	24,006	-	25,514
Van-Minivan	34,019	35,019	25,716	35,656	37,176
Van-Heavy	35,947	36,154	36,841	38,076	44,774
Van-Std	35,770	34,596	37,942	41,786	44,147

Battery Electric Standard Vehicles

2019	2020	2021	2022	2023*	Coming
41,428	41,713	46,637	48,134	48,667	-
-	-	-	-	-	(2024)
-	-	-	-	-	(2024)
41,062	41,505	42,143	36,073	31,323	-
-	-	-	-	-	(2024)
-	-	-	53,085	51,660	-
-	-	-	-	-	(2025)

Source: Staff analysis of 2022 DMV data and 2023 DataOne

2022 Model Year Miles per Gasoline Gallon Equivalent (Population Weighted)

Standard Class	Gasoline	BEV
Car-Compact	33.0	113.2
Car-Large	20.7	–
Car-Midsize	30.7	129.3
Car-Sport	21.2	90.5
Car-Subcompact	32.2	110.0
Pickup-Compact	20.3	–
Pickup-Heavy	18.0	–
Pickup-Std	17.5	69.0
SUV-Compact	28.1	103.3
SUV-Large	17.2	–
SUV-Midsize	22.1	114.6
SUV-Subcompact	29.2	–
Van-Minivan	22.4	51.0
Van-Heavy	22.5	–
Van-Std	22.0	106.8

Source: Staff analysis of 2022 DMV data and 2023 DataOne

Thank You
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