

Select Initial Results from 2021 Vehicle In-Use Survey (VIUS)

Since the close of the Phase 3 comment period, the results of the first national survey of commercial trucks in nearly two decades were published.¹ This survey affirms a shift over the past two decades towards increased regional operation of Class 7-8 tractors and underscores the wide range of commercial operations of all heavy-duty trucks that can utilize the depot-centered charging model most common today.²

Common daily operating distance has reduced slightly over the past two decades.³ In 2021, **91 percent of commercial MHDVs typically traveled less than 200 miles each day**, up two percent from 2002 (Table 1). What's more, 96 percent of *non*-tractor ("straight") commercial MHDVs and 67 percent of tractor trucks typically traveled less than 200 miles each day (Table 2). These vehicles' duty cycles are likely to fall within the range of currently or soon-to-be available ZEV options.

The result showing that 96 percent of non-tractors travel less than 200 miles per day also presents a strong case that a system of widespread, publicly available megawatt standard chargers *does not preclude* accelerated commercial vehicle electrification. Additionally, over 80 percent of Class 4 through 8 commercial HDVs, as well as around 85 percent of Class 7 and 8 tractors, that travel <200 miles daily are based out of a commercial, industrial, agricultural, or energy production site (Table 4).

While a comprehensive heavy-duty EV publicly available charging network will grow the use cases for electrification, there are already more than sufficient opportunity based on current fleet characteristics to grow the fleet of electric trucks well beyond the levels of market share assumed by EPA in its proposal. A robust national charging infrastructure is not a prerequisite for strong standards but will be accelerated by the certainty that strong standards provide.

¹U.S. Department of Transportation, Bureau of Transportation Statistics; and, U.S. Department of Commerce, U.S. Census Bureau. 2023-12. 2021 Vehicle Inventory and Use Survey Datasets: 2021 Public Use File (PUF). U.S. Department of Transportation, Bureau of Transportation Statistics; U.S. Department of Commerce, U.S. Census Bureau; U.S. Department of Transportation, Federal Highway Administration; U.S. Department of Energy. Accessed February 1, 2024, from <https://www.census.gov/data/datasets/2021/econ/vius/2021-vius-puf.html>. The last Vehicle Inventory and Use survey was completed in 2002:

<https://www.census.gov/library/publications/2002/econ/census/vehicle-inventory-and-use-survey.html>.

² Results presented are preliminary. Sample used in analysis includes only vehicles that conducted commercial activity *at least part of the time* in 2021 and excludes Class 2a and smaller vehicles, vehicles whose primary operating range were on non-public roads or off-road, vehicles that did not operate in 2021, or vehicles registered in New Hampshire (not included in 2021 VIUS).

³ Here we use the Primary Daily Operating Range, which indicates the most common distance driven daily during 2021. Survey stratum indicated the percentage of daily operations falling into several different range buckets, with results equaling 100 percent. Strata that did not include complete operating range data or those that indicated a majority of miles traveled off of public roads were not analyzed.

Summary of Range, by Vehicle Count

Table 1

2021 Count of Commercial MHDVs by Primary Daily Operating Range			
Most Common Daily Operating Range	Truck Count	% of all MHDVs	Change from 2002 VIUS
50 miles or less	9,403,425	71%	2.89%
100 miles or less	11,351,565	85%	2.41%
200 miles or less	12,096,532	91%	2%
200 miles or less non-tractor	10,704,488	96%*	2%
200 miles or less, Tractor	1,392,044	67%**	3%

*includes only non-tractors

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Table 2

2021 Vehicle Percentage - Most Common Daily Operating Range			
	Class 2b-3	Class 4-8 straight	Class 7-8 tractor
50 miles or less	78.20%	75.99%	33.84%
51 to 100 miles	12.37%	17.43%	19.93%
101 to 200 miles	4.48%	3.66%	12.75%
201 to 500 miles	2.28%	1.50%	13.73%
501 miles or more	2.67%	1.42%	19.75%
Total	100.00%	100.00%	100.00%

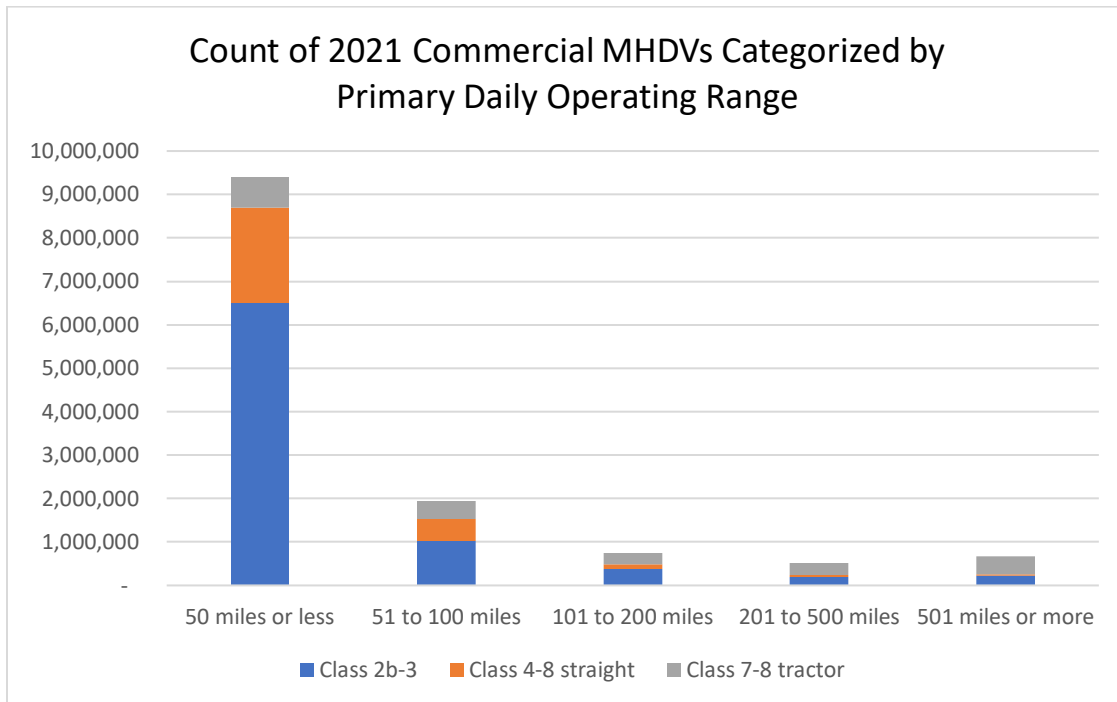
Table 3

Most Common Daily Operating Range by Commercial Vehicle Class - Change from 2002 to 2021			
	Class 2b-3	Class 4-8 straight	Class 7-8 tractor
50 miles or less	3.14%	1.22%	1.25%
51 to 100 miles	-2.23%	3.31%	1.10%
101 to 200 miles	0.32%	-0.58%	0.59%
201 to 500 miles	-0.66%	-2.58%	-1.29%
501 miles or more	-0.57%	-1.38%	-1.66%

Table 4

Home Base Characteristics of Vehicles that Typically Operate <200 Miles Daily				
Home Base Type	Class 2b-3	Class 4-8 straight	Class 7-8 tractor	All Type
Private Residence	49.68%	14.77%	12.30%	37.25%
Commercial/Industrial/Shipping Depot	39.61%	74.65%	70.78%	51.32%
Agricultural, Mining, or Energy Production Site	8.76%	7.73%	15.05%	9.28%
Other	1.95%	2.85%	1.87%	2.15%
Total	100.00%	100.00%	100.00%	100.00%

Figure 1



Summary of Range, by Annual VMT

Table 5

2021 VIUS Annual Fleet VMT by Primary Daily Operating Range			
Most Common Daily Operating Range	Annual VMT	2021 VIUS %	Change from 2002 VIUS
50 miles or less, Class 2b-8	100,985,824,063	44%	0.78%
100 miles or less, Class 2b-8	138,282,752,296	60%	0.80%
200 miles or less, Class 2b-8	164,223,661,969	71%	2.38%
200 miles or less, Class 2b-8 Straight	115,628,979,515	90%	-1.97%
200 miles or less, Class 7-8 Tractor	48,594,682,454	47%	5.11%

Table 6

2021 Fleet VMT Percentage - Most Common Daily Operating Range			
	Class 2b-3	Class 4-8 straight	Class 7-8 tractor
50 miles or less	63.93%	65.03%	17.81%
51 to 100 miles	14.10%	23.44%	15.16%
101 to 200 miles	9.98%	6.13%	14.10%
201 to 500 miles	4.80%	2.62%	18.70%
501 miles or more	7.19%	2.77%	34.23%
Total	100%	100.00%	100.00%

Table 7

Most Common Daily Operating Range and Commercial Vehicle Class- VMT Change between 2002 and 2021			
	Class 2b-3	Class 4-8 straight	Class 7-8 tractor
50 miles or less	-5.03%	0.81%	2.33%
51 to 100 miles	-2.73%	3.68%	1.37%
101 to 200 miles	3.20%	-0.90%	1.41%
201 to 500 miles	0.60%	-3.16%	-3.33%
501 miles or more	3.97%	-0.43%	-1.78%

Figure 2

