Regulatory Evaluation of the 2020 Hours of Service Final Rule

Regulatory Impact Analysis
Regulatory Flexibility Act Analysis
Unfunded Mandates Analysis

By

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Federal Motor Carrier Safety Administration

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ABBREVIATIONS, ACRONYMS, AND SYMBOLS

1935 Act	Motor Carrier Act of 1935
1984 Act	Motor Carrier Safety Act of 1984
ANPRM	Advance notice of proposed rulemaking
ATA	American Trucking Associations
ATRI	American Transportation Research Institute
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CMV	Commercial motor vehicle
D.C.	District of Columbia
DOL	Department of Labor
DOT	Department of Transportation
ECEC	Employer Costs for Employee Compensation
ELD	Electronic logging device
E.O.	Executive Order
eCVSP	Electronic Commercial Motor Vehicle Plan
eRODS	Electronic record of duty status
FMCSA	Federal Motor Carrier Safety Administration
FR	Federal Register
FAST Act	Fixing America's Surface Transportation Act
FAF	Freight Analysis Framework
GDP	Gross domestic product
GS	General Schedule
HM	Hazardous materials
HOS	Hours of Service
IFR	Interim Final Rule
IIHS	Insurance Institute for Highway Safety
IRFA	Initial Regulatory Flexibility Analysis
LCV	Longer Combination Vehicle
MCMIS	Motor Carrier Management Information System
NAICS	North American Industry Classification System
NHS	National Highway System
NHS Act	NHS Designation Act of 1995
NPRM	Notice of proposed rulemaking

OES	Occupational Employment Statistics
OMB	Office of Management and Budget
OOIDA	Owner-Operator Independent Drivers Association
OPM	Office of Personnel Management
RODS	Record of duty status
RFA	Regulatory Flexibility Act of 1980
RIA	Regulatory impact analysis
SBA	Small Business Administration
SCE	Safety critical event
SOC	Standard Occupational Classification
TOT	Time-on-task
U.S.	United States
U.S.C.	United States Code
VMT	Vehicle miles traveled
VTTI	Virginia Tech Transportation Institute

EXECUTIVE SUMMARY

This regulatory impact analysis (RIA) provides an assessment of the costs and benefits of the changes to the Hours of Service (HOS) regulations. The current HOS rules limit property-carrying commercial motor vehicle (CMV) drivers to 11 hours of driving time within a 14-consecutive hour period after coming on duty following 10 consecutive hours off duty. Drivers who use sleeper berths may combine 2 hours of off-duty time with 8 consecutive hours in the sleeper berth to accumulate the 10 hours of off-duty time. Drivers must take at least 30 minutes off duty no later than 8 hours after coming on duty if they wish to continue driving after the 8th hour. Drivers must record their on- and off-duty time in a record of duty status (RODS) – previously captured in paper "logs" but today (with certain exceptions) through electronic logging devices (ELDs).

The Department of Transportation (DOT) has longstanding processes to periodically review regulations and other agency actions. If appropriate, the Federal Motor Carrier Safety Administration (FMCSA) will revise regulations to ensure that they continue to meet the needs for which they were originally designed, and that they remain justified.[1] The HOS regulations were identified as an area for potential modifications in 2018, due to changes in tracking HOS brought about by the implementation of the ELD rulemaking (80 Federal Register (FR) 78292, Dec. 16, 2015). The accuracy of the electronic data provided to enforcement officials is much higher than the information that was previously provided on paper.

In response to public comments received on the August 23, 2018, advance notice of proposed rulemaking (ANPRM) (83 FR 42631), at listening sessions held by FMCSA, and on the August 14, 2019, notice of proposed rulemaking (NPRM) (84 FR 44190), the final rule will: (1) provide flexibility for the 30-minute break rule by not requiring a break until the driver has had 8 hours of driving time (instead of on-duty time) without an interruption of at least 30 minutes and allowing the break to be satisfied by a driver using on-duty, not-driving status, rather than off duty; (2) modify the sleeper-berth exception to allow drivers greater flexibility to split their required 10-hours off duty into two periods, one of at least 7 consecutive hours in the sleeper berth and the other of not less than 2 consecutive hours, either off duty or in the sleeper berth, with neither period counting against the driver's 14-hour driving window; (3) change the short-haul exception available to certain commercial motor vehicle (CMV) drivers by lengthening the drivers' maximum on-duty period from 12 to 14 hours and extending from 100 air miles (115.08

[1] *See* E.O. 13777, sec. 1, (Mar. 1, 2017, 82 FR 12285) ("It is the policy of the United States to alleviate unnecessary regulatory burdens placed on the American people or …"); E.O. 13610 (May 14, 2012, 77 FR 28469) (requiring agencies to conduct retrospective analyses of existing rules to determine whether they remain justified); E.O. 13563, sec. 6(b) (Jan. 21, 2011, 76 FR 3821) (requiring agencies to submit a plan "under which the agency will periodically review its existing significant regulations to determine whether any such regulations should be modified, streamlined, expanded, or repealed so as to make the agency's regulatory program more effective or less burdensome in achieving the regulatory objectives"); E.O. 12866, sec. 5, (Sept. 30, 1993) (requiring each agency to "review its existing significant regulations to determine whether any such regulations should be modified or eliminated so as to make the agency's regulatory program more effective in achieving the regulatory objectives, less burdensome, or in greater alignment with the President's priorities and the principles set forth in this Executive order").

statute miles) to 150 air miles (172.6 statute miles),[2] the radius within which the driver may operate; and (4) modify the adverse driving conditions exception by extending by 2 hours the maximum window during which driving is permitted. The first two items apply to drivers operating property-carrying CMVs, while the final two items apply to drivers operating either property-carrying or passenger-carrying CMVs.

This final rule will not result in any new costs for regulated entities. Instead, this rule will result in increased flexibility for drivers and a quantified reduction in costs for motor carriers. The Federal government and States will incur one-time training costs of $8.6 million for training inspectors on the new requirements. The Federal government also will incur a one-time electronic Record of Duty Status (eRODS) software update cost of approximately $20,000. The change to the 30-minute break requirement will result in a reduction in opportunity cost, or a cost savings, for motor carriers. The FMCSA estimates the 10-year motor carrier costs attributable to the changes to the 30-minute break provision at -$2,814.3 million, (or $2,814.3 million in cost savings). As shown in Table ES-1, FMCSA estimates the total costs of this final rule at -$2,366.2 million (or $2,366.2 million in cost savings) discounted at 3%, and -$1,917.5 million (or $1,917.5 million in cost savings) discounted at 7%. Expressed on an annualized basis, this equates to -$277.4 million in costs (or $277.4 million in cost savings) at a 3% discount rate, and -$273.0 million in costs (or $273.0 million in cost savings) at a 7% discount rate. All values are in 2018 dollars.

[2] The term “air miles” (also referred to as nautical miles) refers to the distance between two locations measured by traveling from one to the other over water or in the air. The term “statute miles” (also referred to as land miles) refers to the distance between two locations measured by traveling between them in an imaginary straight line on the ground. An air mile is 6,080 feet, whereas a statute mile is 5,280 feet.

Table ES-1. Total 10-Year and Annualized Costs of the Final Rule (in millions of 2018$)

Year	Federal and State Government Cost	Cost due to Changes in 30-Min Break Provision	Total Costs – Undiscounted	Total Costs – (7% Discount Rate)	Total Costs – (3% Discount Rate)
	(A)	*(B)*	*(C) = (A) + (B)*		
2020	$8.6	($98.3)	**($89.7)**	**($83.8)**	**($87.1)**
2021	$0.0	($296.1)	**($296.1)**	**($258.6)**	**($279.1)**
2022	$0.0	($297.5)	**($297.5)**	**($242.9)**	**($272.3)**
2023	$0.0	($298.9)	**($298.9)**	**($228.0)**	**($265.6)**
2024	$0.0	($300.3)	**($300.3)**	**($214.1)**	**($259.1)**
2025	$0.0	($301.8)	**($301.8)**	**($201.1)**	**($252.7)**
2026	$0.0	($303.2)	**($303.2)**	**($188.8)**	**($246.5)**
2027	$0.0	($304.6)	**($304.6)**	**($177.3)**	**($240.5)**
2028	$0.0	($306.1)	**($306.1)**	**($166.5)**	**($234.6)**
2029	$0.0	($307.5)	**($307.5)**	**($156.3)**	**($228.8)**
Total 10-Year Costs				**($1,917.5)**	**($2,366.2)**
Total Annualized Costs				**($273.0)**	**($277.4)**
(a) Values shown in parentheses are negative values (i.e., less than zero) and represent a decrease in cost or a cost savings.					

There are a number of other potential cost savings of this rule that FMCSA considered that, due to uncertainty around driver behavior, could not be quantified on an industry level. These non-quantified cost savings include increased flexibility resulting from the extension of the duty day and the air-mile radius for those operating under the short-haul exception; the increased options for drivers to respond to adverse driving conditions during the course of their duty period; potentially alleviating the need to apply for exemptions from the 30-minute break requirement and short-haul exception requirements; and increased flexibility afforded to drivers, such as increased options with regard to on-duty and off-duty time resulting from changes to the 30-minute break requirement and the sleeper-berth provisions.

The Agency anticipates that this rule will not have any safety impacts. This is based on the fact that while some of the provisions may allow drivers to use more of their 11-hour driving limit, the changes will also provide drivers with additional flexibility to take breaks without penalty when they are tired. The changes to the 30-minute break provision are anticipated to reduce the number of off-duty breaks for drivers who drive less than 8 hours in an average shift and potentially increase the number of on-duty breaks for drivers who drive more than 8 hours in an average shift. The Agency discussed the value of off-duty breaks as compared to on-duty breaks in previous rulemakings, but did not quantify the safety benefits attributable to the off-duty break when it was promulgated in 2011. Further, FMCSA is reconsidering the value of off-duty breaks relative to on-duty breaks and, in this rule, has focused on a targeted approach to achieve a break

from driving. For these reasons, FMCSA did not quantify any regulatory benefits related to the changes in this proposed rule.

1. INTRODUCTION

1.1 BACKGROUND AND DESCRIPTION OF THIS FINAL RULEMAKING

Subject to limited exceptions, the Hours of Service (HOS) rules limit property-carrying commercial motor vehicle (CMV) drivers to 11 hours of driving time within a 14-consecutive hour period after coming on duty following 10 consecutive hours off duty (except that drivers who use sleeper berths may combine a period of 2 hours of off-duty time with a period of 8 consecutive hours in the sleeper berth). Drivers must take at least 30 minutes off duty if more than 8 hours have passed since their last off-duty period of at least 30 minutes if they wish to drive or continue driving. Drivers must record their on- and off-duty time in records of duty status (RODS) – previously captured in paper "logs" but today (with certain exceptions) through the use of electronic logging devices (ELDs).

The Department of Transportation (DOT) has longstanding processes to periodically review regulations and other agency actions. If appropriate, the Federal Motor Carrier Safety Administration (FMCSA) will revise regulations to ensure that they continue to meet the needs for which they were originally designed, and that they remain justified.[3] On October 2, 2017, DOT published a Notification of Regulatory Review and stated that it was reviewing its "existing regulations and other agency actions to evaluate their continued necessity, determine whether they are crafted effectively to solve current problems, and evaluate whether they potentially burden the development or use of domestically produced energy resources" (82 Federal Register (FR) 45750). As part of these reviews, DOT sought public comment on existing rules that are good candidates for repeal, replacement, suspension, or modification. The HOS regulations were identified as an area for potential modifications in 2018, due, in part, to changes in tracking HOS brought about by the implementation of the ELD rulemaking (80 FR 78292, Dec. 16, 2015). While the ELD rule did not change the HOS rules, the accurate recording of driving time by ELDs highlighted the rigidity of certain HOS provisions and the practical ramifications drivers operating under the rules faced. On May 17, 2018, Administrator Martinez received a bipartisan letter signed by 30 Senators expressing support for greater flexibility within HOS regulations.

Executive Order (E.O.) 13771, Reducing Regulation and Controlling Regulatory Costs, issued on January 30, 2017, directs executive agencies of the Federal government to "manage the costs associated with the governmental imposition of private expenditures required to comply with Federal regulations" (82 FR 9339, Feb. 3, 2017). E.O. 13777, Enforcing the Regulatory Reform Agenda, issued on February 24, 2017, sets forth regulatory reform initiatives and policies to "alleviate unnecessary regulatory burdens placed on the American people" (82 FR 12285, March 1, 2017). In accordance with these Presidential directives and based upon its experience and expertise, FMCSA reviewed the driver HOS regulations to determine if revisions may alleviate unnecessary regulatory burdens while maintaining CMV driver safety and health, motor carrier safety, and the safety of the public.

The August 23, 2018, advance notice of proposed rulemaking (ANPRM) (83 FR 42631) asked for public comment on four subject areas: short haul operations, the adverse driving conditions

[3] *Please see footnote 1, above.*

exception, the 30-minute break, and the sleeper-berth provision. The ANPRM also sought public comment on two petitions for rulemaking, one from the Owner-Operator Independent Drivers Association (OOIDA) and one from TruckerNation.org.

FMCSA held a series of public listening sessions in Dallas, Texas, on August 24, 2018; Reno, Nevada, on September 24, 2018; Joplin, Missouri, on September 28, 2018; Orlando, Florida, on October 2, 2018; and Washington, District of Columbia (D.C.), on October 10, 2018.[4] On August 22, 2019, FMCSA issued a notice of proposed rulemaking (NPRM) concerning amendments to the HOS requirements (84 FR 44190).

In response to public comments received on the ANPRM, at the listening sessions, and on the NPRM, this rule does four things: (1) increases flexibility for the 30-minute break rule by not requiring a break until a driver has had 8 hours of driving time (instead of on-duty time) without an interruption of at least 30 minutes, and allowing the requirement to be satisfied by an on-duty break from driving, rather than an off-duty break; (2) modifies the sleeper-berth exception to allow drivers greater flexibility to split their required 10-hours off duty into two periods, one of at least 7 consecutive hours in the sleeper berth and the other of not less than 2 consecutive hours (provided the two periods total at least 10 hours), either off duty or in the sleeper berth, with neither period counting against the driver's 14-hour driving window; (3) changes the short-haul exception available to certain CMV drivers by lengthening the drivers' maximum on-duty period from 12 to 14 hours and extending the radius within which the driver may operate from 100 air miles (115.08 statute miles) to 150 air miles (172.6 statute miles); and (4) modifies the adverse driving conditions exception by extending by 2 hours the maximum window during which driving is permitted. The final two items apply to the drivers operating property-carrying and passenger-carrying CMVs.

History of Hours of Service Rulemaking Activities

The HOS regulations in effect until 2003 were promulgated pursuant to the Motor Carrier Act of 1935 (1935 Act) and then reissued under the Motor Carrier Safety Act of 1984 (1984 Act), along with the rest of the Federal Motor Carrier Safety Regulations (53 FR 18042, May 19, 1988). The HOS rules are codified at Part 395 of Title 49, Code of Federal Regulations (CFR). These regulations were originally adopted in 1936, revised several times before 1940, and then left largely unchanged until 1962. They required 8 hours off between tours of duty that could be of indeterminate length, lasting until the driver accumulated 15 hours on duty. Concerns that these regulations were outdated and contributed to driver fatigue led to an effort to incorporate new knowledge about fatigue and rest, and their effects on safety.

The 2003 Revised Rule

[4] Listening sessions were announced in the *Federal Register* at 83 FR 42630, August 23, 2018; 83 FR 45204, September 6, 2018; 83 FR 47589, September 20, 2018; 83 FR 48787, September 27, 2018, and 83 FR 50055, October 4, 2018, the listening session scheduled for September 14, 2018 in Washington, D.C. was canceled and rescheduled. Transcripts of those listening sessions are available in the public docket for the rulemaking, and these sessions are available to stream at: https://www.fmcsa.dot.gov/mission/policy/public-listening-sessions-hours-service.

Revisions to the HOS regulations were proposed in an NPRM published May 2, 2000, (65 FR 25540). Following reviews of the comments to the docket and additional study, FMCSA developed a revised set of HOS regulations. The final rule (the "2003 HOS rule") was promulgated on April 28, 2003 (68 FR 22456), and took effect on January 4, 2004. A regulatory impact analysis (RIA) comparing the costs, benefits, and impacts of this rule relative to the previous rule and several alternatives was prepared in accordance with the requirements of E.O. 12866. That RIA, which is available in the HOS rule docket [FMCSA (2002a)], showed that full compliance with the 2003 HOS rule could both save lives and increase productivity compared to full compliance with the rule then in existence. Much of the safety advantage of the 2003 HOS rule was shown to come from the mandate for at least 10 hours off after each tour of duty, and from encouraging drivers to maintain a regular 24-hour cycle.

The 2004 Appeals Court Action and 2005 Final Rule

After the 2003 HOS rule had been in effect for several months, it was vacated by a Federal appellate court. The United States (U.S.) Court of Appeals for the D.C. Circuit held, on July 16, 2004, that FMCSA had not considered effects of the changes in the HOS rule on drivers' health, as required by 49 United States Code (U.S.C.) 31136(a)(4). Public Citizen *et al*. v. FMCSA, 374 F.3d 1209 (D.C. Cir. 2004). Additionally, the Court expressed concerns about several areas of the rule, including:

- Permission to drive 11 hours in a tour of duty, rather than 10;
- Allowing more hours on duty in a given week as a result of the restart provisions;
- Allowing drivers to split their off-duty periods into two parts through the use of sleeper berths (that is, bunks within the tractor); and
- Lack of consideration of the use of electronic on-board recorders.

In response to the Court's action, Congress reinstated the 2003 HOS rule for a year, to give FMCSA a chance to revisit the issues cited by the Court [FMCSA (2003)]. A new HOS rule was published on August 25, 2005, retaining most of the provisions of the 2003 rule but requiring drivers using sleeper berths to spend 8 consecutive hours in the berth and take an additional 2 hours either off duty or in the sleeper berth; this 2-hour period must be counted against the 14-hour driving window (70 FR 49978). This established one eight-hour period of sleep as called for by various scientific research studies, yet provided the driver flexibility in use of the shorter off-duty period. Drivers, however, objected to 8 hours in the sleeper berth and the lack of flexibility provided by the sleeper-berth provisions and 14-hour rules in general. The 2005 HOS rule also provided relief to some short-haul operations using lighter trucks [FMCSA (2005a)].

The 2007 Appeals Court Action

Public Citizen and others challenged the August 2005 HOS rule on several grounds. On July 24, 2007, the D.C. Circuit ruled in favor of Public Citizen and vacated the 11-hour driving time and 34-hour restart provisions (Owner-Operator Independent Drivers Association. Inc. v. FMCSA, 494 F.3d 188 (D.C. Cir. 2007)). The Court concluded that FMCSA had violated the Administrative Procedure Act's requirements by failing to provide an opportunity for public comment on the methodology of the Agency's operator-fatigue model, which FMCSA had used

to assess the costs and benefits of alternative changes to the 2005 HOS rule. In particular, the Court found that the Agency had not adequately disclosed and made available for review the modifications it had made to the 2003 operator-fatigue model to account for time-on-task (TOT) effects in the 2005 analysis. The Court concluded that FMCSA's methodology had not remained constant from 2003 to 2005 because the TOT element in the model was new and constituted the Agency's response to a defect in its previous methodology. The Court concluded that the Agency violated the Administrative Procedure Act because it failed to give interested parties an opportunity to comment on the methodology of the crash risk model that the Agency used to justify an increase in the maximum number of daily and weekly hours that CMV drivers may drive and work. The Court listed several elements of the way FMCSA calculated the impact of TOT that it held could not have been anticipated and that were not disclosed in time for public comment upon them.

Turning to Public Citizen's second argument, the Court also found that FMCSA had failed to provide an adequate explanation for certain critical elements in the model's methodology. In vacating the increase in the daily driving limit from 10 to 11 hours, the Court found arbitrary and capricious what it described as FMCSA's "complete lack of explanation for an important step in the Agency's analysis," the manner in which it had plotted crash risk as a function of TOT per hours of driving. The Court also found that FMCSA had failed to provide an explanation for its method for calculating risk relative to average driving hours in determining its estimate of the increased risk of driving in the 11th hour. In vacating the 34-hour restart provision, the Court found that FMCSA also had provided no explanation for the failure of its operator-fatigue model to account for cumulative fatigue due to the increased weekly driving and working hours permitted by the 34-hour restart provision.

In an order filed on September 28, 2007, the Court granted in part FMCSA's motion for a stay of the mandate. The Court directed that issuance of the mandate be withheld until December 27, 2007.

On December 17, 2007, FMCSA published an Interim Final Rule (IFR) amending the Federal Motor Carrier Safety Regulations, effective December 27, 2007, to allow CMV drivers up to 11 hours of driving time within a 14-hour, non-extendable window from the start of the workday, following 10 consecutive hours off duty (72 FR 71247). The IFR also allowed motor carriers and drivers to restart calculations of the weekly on-duty time limits after the driver has at least 34 consecutive hours off duty. FMCSA explained that the IFR reinstating the 11-hour limit and the 34-hour restart was necessary to prevent disruption to enforcement and compliance with the HOS rule when the Court's stay expired, and would ensure that a familiar and uniform set of national rules governed motor carrier transportation. Public Citizen immediately requested the D.C Circuit to invalidate the IFR. However, on January 23, 2008, the Court issued a *per curiam* order denying Public Citizen's request. On November 19, 2008, FMCSA adopted the provisions of the IFR as a final rule (73 FR 69567).

2008 Petition and Settlement Agreement

On December 18, 2008, Advocates for Highway and Automotive Safety, Public Citizen, the International Brotherhood of Teamsters, and the Truck Safety Coalition (hereafter referred to as "HOS petitioners") petitioned FMCSA to reconsider the research and crash data justifying the

11-hour driving rule and the 34-hour restart provision. FMCSA denied the petition on January 16, 2009. On March 9, 2009, the HOS petitioners filed a petition for judicial review of the 2008 rule in the D.C. Circuit and, on August 27, 2009, filed their opening brief. However, in October 2009, DOT, FMCSA, and the HOS petitioners reached a settlement agreement. DOT and FMCSA agreed to submit a new HOS NPRM to the Office of Management and Budget (OMB) by July 26, 2010, and to publish a final rule by July 26, 2011. Subsequently, FMCSA, DOT and the HOS petitioners agreed to publish the final rule on October 28, 2011. The parties filed a joint motion to hold the 2009 lawsuit in abeyance pending publication of the NPRM; the court later accepted that motion.

The 2011 Revised Final Rule[5]

In 2011, after presenting various alternatives, FMCSA revised some aspects of the HOS regulations and maintained other provisions. The 2011 final rule could be divided into "daily" and "multi-day" provisions, which can be expressed as follows:

- Drivers of property-carrying CMVs must take at least 30 minutes off-duty no later than 8 hours after coming on duty if they wish to continue driving after the 8th hour.
- Drivers of property-carrying CMVs may drive up to 11 hours following an off-duty period of at least 10 consecutive hours.
- Drivers of property-carrying CMVs may not drive after the end of the 14th hour after coming on duty following an off-duty period of at least 10 consecutive hours.
- A driver may obtain the equivalent of 10 consecutive hours off duty if he/she has a period of at least 8 hours in the sleeper berth and a second period of at least 2 hours either off duty or in the sleeper berth. It doesn't matter which order the two periods occur and compliance is calculated from the end of the first two periods.
- Any period of 7 or 8 consecutive days can begin following a period of at least 34 consecutive hours off duty.

Several categories of motor carriers and drivers are exempt from parts of the HOS regulations or from the entire HOS regulation under the National Highway System (NHS) Designation Act of 1995 (referred to as the NHS Act)[6] or other statutes.

The 2012 Appeals Court Action

Public Citizen, the American Trucking Associations, and others challenged the 2011 final rule on several grounds. On August 2, 2013, the D.C. Circuit vacated the requirement for short-haul drivers to take a 30-minute break, but upheld the 2011 rule in all other respects. American Trucking Associations, Inc., v. Federal Motor Carrier Safety Administration, 724 F.3d 243 (2013).

The 2015 and 2016 DOT Appropriations Acts and the Further Continuing and Security Assistance Appropriations Act, 2017

[5] FMCSA. 2011. Hours of Service of Drivers. https://www.fmcsa.dot.gov/regulations/rulemaking/2011-32696
[6] NHS Designation Act of 1995. P.L. 104-59, 109 Stat. 588. https://www.fhwa.dot.gov/legsregs/nhs_sec.html

The Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. 113-235, Div. K, Title I, sec. 133, 128 Stat. 2130, 2711 (Dec.16, 2014) suspended the 2011 restart provisions, which required 2 consecutive off-duty periods between 1:00 and 5:00 a.m.; temporarily reinstated the pre-2011 restart rule; and required a study of the effectiveness of the new rule. The Consolidated Appropriations Act, 2016, Pub. L. 114-113, Div. L, Title I, sec. 133, 129 Stat. 2242, 2850 (Dec. 18, 2015) made it clear that the 2011 restart provisions would have no effect unless the study required by the 2015 DOT Appropriations Act showed that those provisions had statistically significant benefits compared to the pre-2011 restart rule, including driver health and longevity. Finally, the Further Continuing and Security Assistance Appropriations Act, 2017, Pub. L. No.; 114-254, Div. A, sec. 180, 130 Stat. 1005, 1016, Dec. 10, 2016, replaced Sec. 133 of the 2016 DOT Appropriations Act in its entirety to correct an error and ensure that the pre-2011 restart rule would be reinstated by operation of law unless the study required by the 2015 DOT Appropriations Act showed that the 2011 restart rule had statistically significant benefits compared to the pre-2011 restart rule. DOT concluded that the study failed to find statistically significant benefits, and the Office of Inspector General confirmed that conclusion in a report to Congress. The pre-2011 restart rule was therefore reinstated by operation of law.

1.2 LEGAL BASIS FOR THE RULEMAKING

This final rule is based on authority derived from the 1935 Act and the 1984 Act. The 1935 Act, as amended, provides that "The Secretary of Transportation may prescribe requirements for— (1) qualifications and maximum hours of service of employees of, and safety of operation and equipment of, a motor carrier; and, (2) qualifications and maximum hours of service of employees of, and standards of equipment of, a motor private carrier, when needed to promote safety of operation" (49 U.S.C. 31502(b)(1), (2)). The HOS regulations below concern the "maximum hours of service of employees" of both motor carriers and private motor carriers as authorized by the 1935 Act.

This rule also is based on the authority of the 1984 Act, as amended, which provides broad concurrent authority to regulate drivers, motor carriers, and vehicle equipment. It requires the Secretary of Transportation to "prescribe regulations on commercial motor vehicle safety. The regulations shall prescribe minimum safety standards for commercial motor vehicles." The 1984 Act also requires that: "At a minimum, the regulations shall ensure that— (1) commercial motor vehicles are maintained, equipped, loaded, and operated safely; (2) the responsibilities imposed on operators of commercial motor vehicles do not impair their ability to operate the vehicles safely; (3) the physical condition of operators of commercial motor vehicles is adequate to enable them to operate the vehicles safely . . . ; (4) the operation of commercial motor vehicles does not have a deleterious effect on the physical condition of the operators; and (5) an operator of a commercial motor vehicle is not coerced by a motor carrier, shipper, receiver, or transportation intermediary to operate a commercial motor vehicle in violation of a regulation promulgated under this section…" (49 U.S.C. 31136(a)(1)-(5)).

This rule is based specifically on section 31136(a)(2) and, less directly, sections 31136(a)(3) and (4). To the extent section 31136(a)(1) focuses on the mechanical condition of CMVs, that subject is not included in this rulemaking. However, as the phrase "operated safely" in paragraph (a)(1) also addresses safe driving practices, this final rule also addresses that mandate. To the extent

section 31136(a)(4) focuses on health of the driver, the Agency addresses that issue under section *Health Impacts*, below. As for section 31136(a)(5), FMCSA anticipates the added flexibility of the final rule would not increase the risk of coercion related to HOS rules; in fact, greater flexibility is likely to reduce that risk.

Before prescribing any regulations under these authorities, FMCSA must consider their "costs and benefits" (49 U.S.C. 31136(c)(2)(A) and 31502(d)). Those factors are addressed below.

2. REGULATORY ANALYSIS

2.1 EXECUTIVE ORDER 12866 (REGULATORY PLANNING AND REVIEW)

OIRA has determined that this rulemaking is an economically significant regulatory action under E.O. 12866,[7] Regulatory Planning and Review, as supplemented by E.O. 13563 (76 FR 3821, January 21, 2011). It also is significant under DOT regulatory policies and procedures because the economic costs and benefits of the final rule exceed the $100 million annual threshold and because of the substantial congressional and public interest concerning the HOS rules.

E.O. 12866 directs each agency to identify the problem it intends to address, as well as the significance of that problem.[8] OMB Circular A-4[9] and the accompanying document "Regulatory Impact Analysis: A Primer"[10] provide guidance for how agencies should implement E.O. 12866, including guidance on identifying and describing the problem that the regulatory action intends to address, and whether "the action is intended to address a market failure or promote some other goal."[11]

2.2 IDENTIFICATION OF THE PROBLEM AND THE NEED FOR THE RULE

The introduction of ELDs and their ability to more accurately record compliance with HOS regulations for drivers of CMVs have highlighted practical effects of the rigidity of HOS rules. The accuracy of the electronic data provided to enforcement is much higher than the information that drivers provided in their logbooks. As a result, drivers and others have looked for additional flexibility in compliance requirements, given ELDs' impact on their operations. This has prompted numerous requests from Congress and the public for FMCSA to consider revising certain HOS provisions. FMCSA has longstanding processes, which provide that regulations and other agency actions are periodically reviewed and, if appropriate, are revised to ensure that they

[7] 58 FR 51735-51744 (September 30, 1993).
[8] Executive Office of the President. *Executive Order 12866 of September 30, 1993*. *Regulatory Planning and Review*. 58 FR 51735-51744. October 4, 1993. Page 51735.
[9] OMB. *Circular A-4*. *Regulatory Analysis*. September 17, 2003.
[10] OMB. *Regulatory Impact Analysis: A Primer*.
[11] OMB. *Regulatory Impact Analysis: A Primer*. Page 2.

continue to meet the needs for which they were originally designed, and that they remain justified.[12] Further, on October 2, 2017, DOT published a Notification of Regulatory Review and stated that it was reviewing its "existing regulations and other agency actions to evaluate their continued necessity, determine whether they are crafted effectively to solve current problems, and evaluate whether they potentially burden the development or use of domestically produced energy resources" (82 FR 45750). As part of these reviews, DOT sought public comment on existing rules that are good candidates for repeal, replacement, suspension, or modification. The HOS regulations and ELDs were the most common substantive topics discussed in response to the DOT Notification of Regulatory Review. The HOS regulations were identified as an area for potential modifications, due to changes in tracking HOS brought about by the implementation of the ELD rulemaking (80 FR 78292, Dec. 16, 2015). Consistent with these processes and with the goal of improving regulatory efficiency, the Agency is revising the HOS requirements applicable to CMV drivers. The Agency believes the modest changes made in this rulemaking can provide additional flexibility without degrading safety, regardless of how the time is recorded.

2.3 SCOPE AND PARAMETERS OF THE ANALYSIS

2.3.1 Presentation of Figures

This analysis follows guidance issued by OMB in its Circular A-4.[13] The main discussion within this analysis presents annualized costs and benefits discounted at a 7% discount rate over a 10-year period that begins with an anticipated 2020 compliance date of the rule.[14] Annualized costs and benefits are also presented discounted at a 3% discount rate. Following OMB guidance, as the annual impact of this rule does not exceed $1 billion, a formal quantitative analysis of uncertainty is not required and therefore not included.

2.3.2 Labor Costs

FMCSA computes its estimates of labor costs using data gathered from several sources. Labor costs in this analysis comprise wages, fringe benefits, and where applicable, overhead rates. Fringe benefits include paid leave, bonuses and overtime pay, health and other types of insurance, retirement plans, and legally required benefits (Social Security, Medicare, unemployment insurance, and workers' compensation insurance). Overhead includes any expenses to a firm associated with labor that are not part of employees' compensation; this typically includes many types of fixed costs of managing a body of employees, such as management and human resource staff salaries or payroll services. FMCSA develops labor costs for State and Federal Safety Investigators and Roadside Inspectors and CMV drivers.

The primary source for State wages is the median hourly wage data (May 2018) from the U.S. Department of Labor (DOL), Bureau of Labor Statistics (BLS), Occupational Employment Statistics (OES). [15] The OES data provides both the employment counts and the hourly median

[12] *See* footnote 1, above.
[13] OMB. *Circular A-4*. *Regulatory Analysis*. September 17, 2003. Available at: *https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/* (accessed January 4, 2019).
[14] All figures are presented in year 2018 dollars. Figures not originally expressed in year 2018 dollars have been updated using the gross domestic product (GDP) deflator published by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). Available at: http://www.bea.gov/iTable/index_nipa.cfm (accessed January 6, 2020).
[15] DOL, BLS. *OES*. *National*. *May 2018*. Available at: https://data.bls.gov/oes (accessed December 26, 2019).

wage for Police and Sheriff's Patrol Officers Standard Occupational Classification (SOC) code 333051) by State. However, the State Safety Investigators are not equally distributed across the country, requiring FMCSA to adjust the OES data based on the number of inspectors in each State, thereby developing a weighted national median hourly base wage rate of $31.37, to which FMCSA applies fringe benefits and overhead. BLS does not publish data on fringe benefits for specific occupations, but it does for the broad industry groups (such as State and local government workers) in its Employer Costs for Employee Compensation (ECEC) release. FMCSA used the ratio of benefits to wages for State and local government workers from the ECEC release as an estimate of the ratio of benefits to wages for State Safety Investigators. For State and local government workers, fringe benefits in ECEC data are equal to 60% ($19.47 ÷ $32.19) of wages. [16] Applying this ratio to the median hourly base wage rate for Police and Sherrif's Patrol Officers, FMCSA estimates that Safety Investigators and Roadside Inspectors' average hourly benefits are equal to $18.97 ($31.37 × 60%). All States requesting grant funding from FMCSA must provide an electronic Commercial Motor Vehicle Plan (eCVSP), which contains budget information and indirect (or overhead) rates, if applicable.[17] FMCSA reviewed the eCVSPs and estimates an average overhead rate of 20%, or $6.27 ($31.37 × 20%). The median hourly wage rate, inclusive of fringe benefits and overhead, for State Safety Investigators and Roadside Inspectors is $57 ($31.37 + $18.97 + $6.27, rounded to the nearest whole dollar).

The primary source for Federal Safety Investigators and Roadside Inspectors wages is the Office of Personnel Management (OPM) pay tables, updated for 2020.[18] The OPM pay rates for General Schedule (GS) employees consist of a base rate and a locality adjustment depending on where the employee is located. Federal Safety Investigators and Roadside Inspectors are employed in pay grades from GS-7 to GS-13 and have base rates ranging from $20.26 to $42.73 at the step 5 level (the step 5 level is intended to reflect the midpoint of each grade's wage range and simplify the estimation process). The OPM FedScope database contains the number of people in each pay grade, by occupational code.[19] The Motor Carrier Safety employee code is 2123. Using these population numbers and the GS step 5 wage rates, FMCSA developed a weighted base wage rate of $31.43 for Federal Safety Investigators and Roadside Inspectors.

FMCSA personnel are located throughout the country, with locality adjustments ranging from 16% to 32%. Based on the number of investigators and inspectors in each locality pay area, FMCSA developed a weighted average locality rate of 23% and a locality-adjusted base wage rate of $38.56 ($38.56 = $31.43 × (1+ 23%)).

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[16] DOL, BLS. *Table 3: Employer costs for employee compensation for state and local government workers by occupational and industry group (Sept 2019).* Available at: https://www.bls.gov/news.release/ecec.t03.htm (accessed January 17, 2020).

[17] Motor Carrier Safety Assistance Program. Fiscal Year 2019 Commercial Vehicle Safety Plans. Available at: https://www.fmcsa.dot.gov/fastact/mcsap-fiscal-year-2019-commercial-vehicle-safety-plans-fast-section-5101c3 (accessed January 16, 2020).

[18] OPM. Set of All Locality Pay Tables, Effective January 2020. Available at: https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2020/salhrl.pdf (accessed January 17, 2020).

[19] OPM. *Federal Workforce Dataset. March 2019 Employment Datacube.* Available at https://www.fedscope.opm.gov (accessed on January 17, 2020).

The OPM does not publish hourly rates that include fringe benefits or overhead. OMB does publish an object class analysis of the budget of the U.S. Government. The object class analysis estimates that, in 2019, DOT will spend $6,429 million in employee compensation and $2,487 million in employee benefits. Based on this, FMCSA estimates a fringe benefit rate of 39% (2,487 ÷ 6,429) for FMCSA personnel, or $14.92 ($38.57 × 39%).[20] FMCSA uses the DOT Volpe Center overhead rate of 59% for Federal personnel, or $22.75 ($38.57 × 59%).[21] The Volpe Center is a Federal fee-for-service research and innovation center in the DOT. Unlike most Federal agencies, Volpe receives no direct appropriation from Congress and must cover direct and indirect expenses through agreements with project sponsors. These indirect costs are recovered through the overhead rate charged on direct labor costs. Volpe employees are compensated according to the Federal locality pay tables used for all Federal employees and their labor costs include the same employee benefits. Therefore, FMCSA believes that the overhead rate for Volpe personnel is similar to the rate for all DOT personnel. The hourly wage rate, inclusive of fringe benefits and overhead, for Federal Safety Investigators and Roadside Inspectors is $76 ($38.56 + $14.92 + $22.75, rounded to the nearest whole dollar).

FMCSA also developed wage rates for Federal master trainers and trainers that will train the investigators and inspectors. FMCSA anticipates that master trainers will be GS-14 employees located in Washington, D.C., with a locality-adjusted pay rate of $65.88. Applying the fringe benefit rate of 39% ($65.88 × 39% = $25.49) and the overhead rate of 59% ($65.88 × 59% = $38.86), FMCSA developed the master trainer hourly wage rate of $130 ($130 = $65.88 + $25.49 + $38.86, rounded to the nearest whole dollar). FMCSA anticipates that Federal trainers will be GS-13 employees from various localities across the United States. FMCSA uses a base wage rate of $42.73 and applies the average locality of 23% to develop the locality-adjusted pay rate of $52.41 ($52.41 = $42.73 × (1 + 23%)). Applying the fringe benefit rate of 39% ($52.41 × 39% = $20.28) and the overhead rate of 59% ($52.41 × 59% = $30.92), FMCSA developed the trainer hourly wage rate of $104 ($104 = $52.41 + $20.28 + $30.92, rounded to the nearest whole dollar).

If estimated, driver opportunity cost would be evaluated using driver labor costs.[22] When evaluating the impact of certain costs upon individuals, such as opportunity costs to drivers, the best practice is to represent that opportunity cost with the driver's hourly base wage plus fringe benefits, exclusive of overhead. Including an overhead rate as a component element of the driver wage rate, over and above the base wage and fringe benefits, for the purposes of evaluating the opportunity cost to drivers does not accurately reflect the value as incident upon the driver (because the value of the overhead component of wage rates is not incident upon, nor received as compensation by, the driver, as are base wages and fringe benefits). The driver's hourly base wage plus fringe benefits represents the value to the driver of his or her forgone best alternative (i.e., in the absence of this rule it is assumed these individuals would be forced to remain off-

[20] OMB. *An American Budget, Object Class Analysis.* Table 1 – Obligations by Object Class, page 19 Available at: https://www.whitehouse.gov/wp-content/uploads/2018/02/objclass-fy2019.pdf (Accessed on: January 17, 2020)
[21] DOT, Volpe Center. *Volpe Project Costs*. Available at: http://www.volpe.dot.gov/work-with-us/volpe-project-costs (accessed on January 17, 2020).
[22] See 3.1.2 for an explanation on the Agency's decision not to quantify the opportunity cost savings of the 30-minute break to drivers in this final rule.

duty instead of engaging in productive employment with the carrier, and that the value to the individual of being productively employed by the carrier can best be represented by the total of his/her base wage rate plus fringe benefits).

The primary source for driver wages is the median hourly wage data (May 2018) from the DOL, BLS, OES.[23] The HOS rules apply to all CMV drivers, regardless of the industry in which they expect to work. As such, the wages are all industry wages and not only those of drivers in transportation industries. With the exception of the adverse driving condition provision and the maximum duty period under the short-haul exception, the changes in this rule would affect only property-carrying CMV operations. As discussed throughout this RIA, only the impacts to property-carrying CMV operations are quantitatively assessed. As such, the wages identified in Table 1 are for truck driving occupations, across all industries.

BLS does not publish data on fringe benefits for specific occupations, but it does for the broad industry groups in its ECEC release. For drivers, this RIA uses an average hourly wage of $24.30 and average hourly benefits of $10.98 for private industry workers in "trade, transportation, and utilities" to estimate that fringe benefits are equal to 45% ($10.98 ÷ $24.30) of wages.[24]

Table 1 summarizes the wage, time, and labor cost estimates for CMV truck drivers. Two truck driver wage estimates are presented; one for heavy and tractor-trailer truck drivers and one for light truck or delivery service drivers. Per the BLS definition, drivers in the light truck or delivery service industry drive a truck or van with a capacity of less than 26,000 pounds gross vehicle weight and, as such, FMCSA considers them to be a proxy for non-Commercial Driver's License drivers that would be subject to the rule.[25] All wages have been rounded to the nearest dollar. Table 1 displays an average driver wage, weighted by the total employees in each occupational title.

[23] DOL, BLS. *OES*. *National*. *May 2018*. March 30, 2018. Available at: http://www.bls.gov/oes/special.requests/oesm17nat.zip (accessed January 17, 2020).
[24] DOL, BLS. *Table 5: Employer costs for employee compensation for private industry workers by bargaining and work status, Sept 2019.* Available at: https://www.bls.gov/news.release/pdf/ecec.pdf (accessed January 17, 2020).
[25] DOL, BLS. *Occupational Employment and Wages*. *SOC 53-3033*. May 2017. Available at: http://www.bls.gov/oes/2017/may/oes533033.htm (accessed October 29, 2018).

Table 1. Wage Rates for CMV Truck Drivers

Occupational Title	BLS SOC Code	North American Industry Classification System (NAICS) Occupational Designation	Total Employees	Median Hourly Base Wage	Fringe Benefits Rate	Median Hourly Base Wage + Fringe Benefits
Occupations Subject to HOS Rules						
Heavy and Tractor-Trailer Truck Drivers	53-3032	All Industry	1,748,140	$21	45%	$30
Light Truck or Delivery Service Driver	53-3033	All Industry	877,670	$16	45%	$23
Weighted Driver Wage						**$28**

Source: BLS. May 2018 OES Database, National, All Industries. Available at: http://www.bls.gov/oes/

2.4 BASELINE FOR ANALYSIS

2.4.1 CMV Drivers

FMCSA obtained driver count information, by carrier operation, from the Motor Carrier Management Information System (MCMIS), which includes information submitted to FMCSA by motor carriers the first time the carrier applies for a DOT number, and then biennially thereafter. Table 2 displays the 2018 estimate of CMV drivers from MCMIS.

With the current baseline annual number of 6,520,268 CMV drivers (478,184 passenger carrier CMV drivers and 6,042,084 property carrier CMV drivers), FMCSA estimated the future baseline number of CMV drivers who will be affected by this rule annually during the analysis period of 2020 to 2029. These future baseline projections were developed by increasing the current baseline 2018 values consistent with occupation-specific employment growth projections obtained from the BLS Employment Projections program.[26] The BLS employment projections for the following standard occupational classifications were used:

BLS SOC 53-3021 (Bus drivers, transit and intercity)
BLS SOC 53-3022 (Bus drivers, school or special client)
BLS SOC 53-3032 (Heavy and tractor-trailer truck drivers)
BLS SOC 53-3023 (Light truck or delivery service drivers)

The occupational categories noted above do not overlap exactly with the entire population of CMV drivers who will be subject to this rule, primarily because there are some CMV drivers

[26] DOL, BLS. Employment Projections Program. *Table 1.2: Employment by detailed occupation, 2018 and projected 2028*. Available at: http://www.bls.gov/emp/ind-occ-matrix/occupation.xlsx (accessed January 21, 2020).

who operate vehicles over 10,001 pounds but do not specifically declare their occupation as being a bus or truck driver. However, as noted above, this does not mean that those drivers are not reflected in the baseline 2018 estimates of CMV drivers produced above. All CMV drivers, regardless of their occupational category, are included in the estimates. The occupational categories above represent approximately 4.2 million employees in 2018, and combined are used to forecast the future growth from 2018 through 2029 based on the BLS estimates of employees in those industries from 2018 through 2028.

BLS provides baseline 2018 values for the total number of employees in all of the occupational categories noted, as well as estimates for 2028. An annual compound growth rate for net overall growth in the total population of CMV bus drivers and CMV truck drivers was calculated from the growth in the number of employees in these occupations from 2018 to 2028 as projected by BLS. The projected net growth in total employment for BLS SOC 53-3021 (Bus drivers, transit and intercity) from 2018 to 2028 is 6.1%, which equates to a 0.598% annual compound growth rate. The projected net growth in total employment for BLS SOC 53-3022 (Bus drivers, school or special client) from 2018 to 2028 is 4.3%, which equates to a 0.426% annual compound growth rate. FMCSA then computed a weighted average annual compound bus driver growth rate of 0.472% for these two occupational categories. The projected net growth in total employment for BLS SOC 53-3032 (heavy and tractor-trailer truck drivers) from 2018 to 2028 is 5.1%, which equates to a 0.498% annual compound growth rate. The projected net growth in total employment for BLS SOC 53-3033 (light truck or delivery service drivers) from 2018 to 2028 is 4.4%, which equates to a 0.429% annual compound growth rate. FMCSA then computed a weighted average annual compound truck driver growth rate of 0.474% for these two occupational categories. Beyond 2028, these annual compound growth rates were assumed to be the same out to the final year of the analysis period of 2029. FMCSA applies the weighted average annual compound growth rate to the population of CMV bus and truck drivers to estimate the affected driver population throughout the period of analysis, as shown in Table 2.

Due to exceptions and exemptions from the HOS regulations, the total CMV driver population must be broken down based on specific criteria in order to isolate the population that will be affected by each provision of this rule. HOS regulations are dependent on the vehicle operated; for example, drivers of passenger-carrying vehicles must operate under regulations specific to those vehicles and drivers of non-passenger (i.e., property) carrying vehicles must operate under regulations specific to those vehicles. For this reason, Table 2 provides the CMV driver count based on the type of operation (passenger vs. property) in column (B) and column (C). Column (D) is the total CMV driver count. Column (E) is a subset of the property carrier CMV drivers in column (C).

The potential cost savings gained by motor carriers under this final rule are in part a function of the estimated number of CMV drivers subject to the 30-minute break requirement. This rule refers to drivers affected by the 30-minute break requirement as CMV truck drivers.

Those drivers operating passenger carrying vehicles are not subject to the 30-minute break requirement. For this reason, the driver counts in Column (E) are from carriers that do not identify themselves as passenger carriers. Second, those drivers operating under the short-haul exception are not subject to the 30-minute break requirement. Previously, drivers could qualify

for the HOS short-haul exception in § 395.1(e)(1) provided that they return to their normal work reporting location and are released from work within 12 hours after coming on duty, are able to submit their work schedule via time cards, and operate within a 100 air-mile radius of their work reporting location. Under this final rule, drivers can qualify for the HOS short-haul exception provided they return to the normal work reporting location and are released from work within 14 hours after coming on duty, are able to submit their work schedule via time cards, and operate within a 150 air-mile radius of their work reporting location. In the RIA for the NPRM, FMCSA did not estimate an increase in the number of drivers that would be eligible for the short-haul exception based on the alternatives presented but asked for comments on how the rule would affect the number of drivers operating under the exception.

In the ELD rule, FMCSA anticipated that all drivers employed by passenger and private non-passenger (i.e., property) carriers qualifying for the short-haul exception would be able to take advantage of the exception.[27] Carriers report their driver employees to FMCSA based on whether they operate beyond or within a 100 air-mile radius. The number of drivers reported to operate within a 100 air-mile radius was used as a proxy estimate of drivers operating under the short-haul exception. This is not an exact count of drivers who operate under the short-haul exception because it does not include drivers that sometimes operate within 100 air-miles and on these occasions operate as short-haul, and because it includes drivers who operate within 100 air-miles but may not return to their work reporting location within 12 hours.

In preparation for the final rule, FMCSA reviewed the comments received and the short-haul exemption requests in an effort to determine how the rule would affect the number of drivers operating under the short-haul exception. With respect to the extension of the workday from 12 to 14 hours, FMCSA did not receive specific information on the increase in drivers that would be eligible for the short-haul exception. However, between October 22, 2015 and December 3, 2019 FMCSA received approximately 11 short-haul exemption requests seeking extensions of the time required to return to the work reporting location; the requests claim to cover between 100,000 and 150,000 drivers. FMCSA assumes that these drivers operate within 100 air-miles, but do not routinely return to their work reporting location within 12 hours. These drivers were included in the estimate of drivers eligible for, and assumed to be operating under, the short-haul exception. As such, FMCSA does not include a cost savings estimate resulting from the changes to the short haul operations provision included in this rule.

FMCSA has not received an exemption request that references the air-mile radius within which a driver may operate and still maintain eligibility for the short-haul exception. FMCSA did not receive data or information on the number of drivers that routinely operate between 100 and 150 air-miles, and will thus be newly covered by the short-haul exception. However, some commenters stated that they have drivers that routinely operate within 100 air miles, but on occasion their operations require them to drive up to 150 air-miles from their work reporting location. These drivers are generally eligible for the short-haul exception, but must complete RODS and comply with other requirements of 49 CFR Part 395 such as retaining supporting documents and taking a 30-minute break if applicable, when they operate beyond 100 air miles.

[27] DOT, FMCSA. "Regulatory Evaluation of Electronic Logging Devices and Hours of Service Supporting Documents Final Rule." November 2015. Presented in Table 10 on page 34 and discussed on page 33. Available at: https://www.regulations.gov/document?D=FMCSA-2010-0167-2281 (Accessed on: December 6, 2018).

If this occurs more than 8 times in a 30-day period the driver would no longer be eligible for the exception in § 395.8(a)(1)(iii)(A)(*1*), and would be subject to the ELD requirement. This rule will remove the confusion and administrative hassle of estimating the number of times each driver has driven between 100 and 150 air-miles, but will not necessarily increase the number of drivers using the exception.

Due to already existing exemptions from the requirement to return to the work reporting location within 12 hours, and the exception providing the ability to operate without an ELD beyond the short-haul limits up to 8 days in a 30-day period, FMCSA has determined that this rule will not necessarily increase the number of drivers that are covered by the short-haul exception or decrease the number of ELDs in use. Instead, this rule will streamline operations by allowing motor carriers and drivers to be consistently eligible for the short-haul exception without the need to apply for exemptions or rotate drivers based on the number of times they've gone beyond the 12-hour or 100 air-mile radius limit in the previous 30 days. Therefore, FMCSA is not estimating an increase in the number of drivers operating under the short-haul exception for this rule and has determined that the carrier-reported information is a good proxy for the count of drivers who are eligible for, and will operate under, the short-haul exception.

In 2018, there were 1.4 million interstate non-passenger drivers and 1.7 million intrastate non-passenger drivers reported to operate solely within 100 air-miles. Lastly, CMV drivers in Alaska are not subject to the 30-minute break requirement. In 2018, there were approximately 19,000 drivers operating in Alaska. FMCSA estimated the CMV truck drivers currently subject to the 30-minute break requirement by subtracting from the total 6.5 million CMV drivers, the passenger carrier CMV drivers (478,184), the inter- and intrastate CMV truck driver employees that operate within a 100 air-mile radius (3.1 million), and the 19,000 CMV drivers in Alaska. In 2018, that total is 2.9 million CMV truck drivers subject to the 30-minute break requirement (Column (E) below).

Table 2. CMV Driver Counts

Year *(A)*	Passenger Carrier CMV Drivers *(B)*	Property Carrier CMV Drivers *(C)*	Total CMV Drivers *(D) = (B) + (C)*	CMV Drivers Currently Subject to the 30-Minute Break Requirement *(E)*
2018	478,184	6,042,084	6,520,268	2,944,705
2019	480,444	6,070,752	6,551,196	2,958,677
2020	482,714	6,099,556	6,582,270	2,972,715
2021	484,994	6,128,497	6,613,491	2,986,820
2022	487,286	6,157,575	6,644,860	3,000,991
2023	489,588	6,186,791	6,676,378	3,015,230
2024	491,901	6,216,145	6,708,046	3,029,536
2025	494,225	6,245,639	6,739,864	3,043,911
2026	496,560	6,275,273	6,771,833	3,058,353
2027	498,906	6,305,047	6,803,953	3,072,864
2028	501,263	6,334,963	6,836,226	3,087,444
2029	503,631	6,365,021	6,868,652	3,102,093

3. COSTS OF THE FINAL RULE

The Agency does not anticipate that the final rule will result in new costs for the regulated entities, but will result in a decrease in cost, or a cost savings. The Federal government will incur electronic records of duty status (eRODS) software update costs and costs for training enforcement personnel as a result of this rule. A discussion of the impacts resulting from each provision is presented below.

This chapter presents the Agency's analysis of the costs resulting from the following four HOS rule provision amendments or additions that would: (1) increase flexibility for the 30-minute break rule by requiring a break after 8 hours of driving time (instead of on-duty time), and allowing the requirement to be satisfied by an on-duty break from driving, rather than requiring an off-duty break; (2) modify the sleeper-berth exception to allow drivers to split their required 10-hours off duty into two periods, one of at least 7 consecutive hours in the sleeper berth and the other of not less than 2 consecutive hours (provided the two periods total at least 10 hours), either off duty or in the sleeper berth, with neither period counting against the driver's 14-hour driving window; (3) change the short-haul exception available to certain CMV drivers by lengthening the drivers' maximum on-duty period from 12 to 14 hours and extending from the radius within which the driver may operate from 100 air miles (115.08 statute miles) to 150 air miles (172.6 statute miles); and (4) modify the adverse driving conditions exception by extending by 2 hours the maximum window during which driving is permitted. The first two items apply to drivers operating property-carrying CMVs, while the final two items apply to drivers operating either property-carrying or passenger-carrying CMVs.

As is further described below, the efficiencies provided by this rule are expected to allow an increase in driver productivity, resulting in cost savings to motor carriers. Conceptually, to the extent that such savings are passed on to shippers, there could also be a reduction in the price of truck transportation, resulting in increased demand for those services and thus an increase in overall vehicle miles traveled (VMT) for trucks. However, any such potential increases associated with the final rule are expected to be minimal, for several reasons. First, the demand for freight movement in the U.S. is largely determined by factors beyond market prices, including the level of overall economic activity, international trade patterns, and evolving industry supply chains and consumer demands. Second, while the cost savings associated with the rule are economically significant in their own right, they are relatively small in comparison to the vast size of the trucking sector in the U.S. The quantified cost savings would be just 0.03% of total trucking industry revenues of nearly $800 billion in 2018[28], a level that would be almost undetectable in any aggregate VMT data. Finally, as described in further detail below, the operational impacts of the four specific changes in HOS regulations covered by this rule are not expected to have a direct, meaningful impact on truck VMT. This rule will improve efficiency by providing flexibility by allowing operators to shift their work and drive time to mitigate the effect of certain variables (e.g., weather, traffic, detention times, etc.), and to take breaks without penalty when they need rest. While these changes may affect the number of hours driven or hours worked during a given work shift, none of them will increase the maximum allowable driving time on a daily or weekly basis, and FMCSA expects the extent to which this rule can affect the overall level of VMT to be limited.

3.1 30-MINUTE BREAK

3.1.1 Overview

All CMV truck drivers, except those operating under either the short-haul exception or in Alaska, are subject to the 30-minute break requirement as outlined in § 395.3(a)(3)(ii). Previously, under this requirement, driving was not permitted if more than 8 hours had passed since the end of the driver's last off-duty or sleeper-berth period of at least 30 minutes. This requirement resulted in drivers being forced to take 30-minutes of off-duty time following 8 hours of coming on-duty, regardless of the number of hours driven.

In this rule, FMCSA ties the requirement for a break to the number of driving hours rather than the driver's hours on duty. This change will prohibit driving for more than 8 hours without at least a 30-minute change in duty status. This will allow 30 minutes of non-driving status (whether on-duty or off-duty) to count as a break. The changes will increase flexibility by allowing on-duty breaks from driving to meet the requirement, thus reducing the number of drivers affected by the break requirement (i.e., those drivers whose schedules include on-duty breaks from driving will not be required to also take an off-duty break), and reducing the impact on those still required to take a break (i.e., allowing on-duty/non-driving time to satisfy the break requirement). The rule does not change maximum available driving time, and maintains the requirement to take a break from driving. Furthermore, as discussed in section 4.1.1, following

[28] See https://www.trucking.org/article/Trucking-Industry-Revenues-Top-$796-Billion-in-2018 (0.03% = $273 million ÷ 800 billion)

additional analysis and experience with the implementation and enforcement of the 2011 final rule, the Agency is reconsidering the value of off-duty breaks relative to on-duty breaks. In this rule, FMCSA makes changes that, while allowing additional flexibility, will still require a break from driving. FMCSA estimates the value of the potential cost savings to carriers, and provides a qualitative assessment of the potential cost savings to drivers.

3.1.2 Cost Impacts of the Preferred Alternative

The changes in this rule do not result in increased costs for drivers or motor carriers. FMCSA estimates that increased flexibility provided by the rule will result in a cost savings to both carriers and drivers. In the 2011 RIA, the Agency estimated the cost of the 30-minute break to motor carriers.[29] The Agency reviewed the 2011 RIA methodology, and where necessary updated data, reconsidered the assumptions, and implemented changes in best practices to estimate the impact of this rule. While the Agency uses the 2011 RIA to inform the methodology described below, the Agency stresses that the baseline for this analysis is the current situation faced by drivers and carriers, and not the 2011 RIA. The HOS rules previously required a 30-minute off-duty break 8 hours after coming on duty. This rule changes the prohibition against driving after 8 consecutive hours on-duty to a prohibition against driving after 8 hours of driving, and will allow drivers to use on-duty, non-driving time to fulfill the break requirement. This rule will thus reduce the number of drivers required to take a break and allow for flexibility in how drivers spend their time provided they are not driving. The rule will thus result in cost savings to carriers in the form of avoided losses in driver productivity and to drivers in the form of reductions in the off-duty time they are required to take during shifts.

Opportunity Cost of the 30-Minute Break to Motor Carriers

Broadly speaking, the opportunity cost to the motor carrier (the firm) of a given regulatory action is the value of the best alternative that the firm had to forgo in order to comply with the regulatory action. This rule will allow an input of production (driver labor) previously unavailable to a carrier to be put to economically productive use for a time equivalent to the time previously required to be spent in an off-duty status. Because more driver labor hours can be used productively, this will be reflected as reductions in labor costs and forgone profit to the regulated entity.

In their comments to the December 2003 FMCSA Longer Combination Vehicle (LCV) RIA, the American Trucking Associations (ATA) suggested valuing the opportunity cost to the firm as the number of driver labor hours now not available to the firm due to the regulatory action, times the hourly cost to operate a commercial vehicle.[30] Note that we presume that this hourly cost would be a combination of the driver wage rate plus fringe benefits, plus all other costs experienced by the firm in providing their service, such as overhead costs, capital costs (for vehicle, equipment,

[29] FMCSA. 2014. *Regulatory Impact Analysis - Hours of Service Final Rule (December 2011).* Available at: https://cms8.fmcsa.dot.gov/regulations/hours-service/regulatory-impact-analysis-hours-service-final-rule-december-2011

[30] DOT. FMCSA. *Final Regulatory Evaluation, Regulatory Flexibility Analysis, Longer Combination Vehicle Driver Training*. December 2003. Page 9. Available at: http://www.regulations.gov/contentStreamer?documentId=FMCSA-1997-2176-0058&attachmentNumber=1&disposition=attachment&contentType=pdf (accessed April 9, 2015).

office space, warehouse space, insurance and professional services, utilities, etc.), expressed on a per hour basis relative to the number of hours of vehicle operation. FMCSA noted in its response to ATA, however, that it would be incorrect to value the opportunity cost to carriers at this full hourly rate to operate a commercial vehicle, in that this full hourly rate does not represent the value to the firm derived from operating the vehicle. Instead, the value to the firm derived from operating the vehicle would be the profit earned by the carrier as a result of the vehicle being operated for that hour. Therefore, in the December 2003 LCV RIA, FMCSA estimated the opportunity cost to the firm by assuming an average profit margin for motor carriers of 5% (based on various industry data sources and research as noted in the LCV RIA). Therefore, 5% times the hourly cost to operate a commercial vehicle, then times the number of driver labor hours now not available to the firm due to the regulatory action, was the quantitative estimate used to value the opportunity cost of training to the carrier.

In this analysis, FMCSA follows the methodology used in the Entry-Level Driver Training rulemakings published in 2016 and 2018 and values the reduction in driver time spent in nonproductive activity as the opportunity cost to the firm, which is represented by the now attainable profit, using three variables; the hours that would now be available for labor (i.e., those hours that were previously required to be off-duty, and under this rule could be on-duty/non-driving), an estimate of a typical average motor carrier profit margin, and the marginal cost of operating a CMV.

To estimate the hours of labor that will be available to carriers resulting from the changes to the 30-minute break provision, it is crucial to understand the prevailing operating patterns in the industry and the portions of the driver population that will be affected by the changes to the break provision. The previous HOS regulations required a 30-minute off-duty break after 8 hours of coming on-duty, if the driver wished to drive after that point. Thus, only drivers who work for 8 hours trigger the break requirement and are potentially affected by it. In this rule, a 30-minute break will be required following 8 hours of driving. Therefore, those drivers who work more than eight hours, but drive less than eight hours, will receive regulatory relief from the changes in this rule. Additionally, those who drive more than 8 consecutive hours will receive regulatory relief by the allowance of on-duty, non-driving time to meet the 30-minute break requirement.

The Agency has chosen to stratify the population into three driver groups based on their driving and work time; drivers who drive more than eight hours in an average shift (Group 1), drivers who work more than eight hours in an average shift but do not drive more than eight hours (Group 2), and drivers who work fewer than eight hours in an average shift (Group 3). To define driver groups by the intensity of their schedules, the Agency used ELD-captured shift data from Virginia Tech Transportation Institute (VTTI) that was provided by 10 carriers between 2013 and 2016. The 2011 HOS requirements went into effect on July 1, 2013. As such, the time span over which the data was collected allowed the Agency to isolate the impact of the 2011 requirements by segmenting the data into distinct time periods, before and after the 30-minute break provision went into effect. Approximately 13% of drivers provided information before July 1, 2013. This data supported 2 FMCSA studies, which collected data from 11 carriers (each study collected data from nine carriers; thus, several carriers provided data in both studies). One carrier was removed due to poor matching between the ELD and crash data; thus, the dataset

used to support this analysis reflects a total of ten different carriers.[31] Eight of the carriers are for-hire, and two are private carriers. The research team targeted carriers with more than 1,000 power units. These data were combined to increase sample size. FMCSA's analysis is limited by the ELD data that is available, and did not receive input from commenters regarding whether the percent of the workforce in each driver group would change if data from smaller carriers (those with fewer than 1,000 power units) were included in the analysis. For this RIA, FMCSA has not changed the assumption about the percent of the workforce in each driver group. Table 3 shows the percent of the workforce within each driver group, as captured in the VTTI dataset.

Table 3. Driver Groups by Intensity of Schedule

Driver Group	Percent of Workforce
Group 1 - Drivers who drive more than 8 hours in an average shift	17.3%
Group 2 - Drivers who work more than 8 hours in an average shift but do not drive more than 8 hours	56.1%
Group 3 - Drivers who work less than 8 hours in an average shift (unaffected)	26.6%

Source: VTTI data.

The Agency applied the driver group percentages to the estimated population of drivers in 2020 as well as the projected population of drivers for each year of the 10-year analysis period.[32] The total population for each year of the analysis period as well as the estimated number of drivers in each driver group is shown in Table 4.

Table 4. Estimated Driver Population by Driver Group

Year	CMV Drivers Currently Subject to the 30-Minute Break Requirement *(A)*	Group 1 *(B = A × 17.3%)*	Group 2 *(C = A × 56.1%)*	Group 3 *(D = A × 26.6%)*
2020	2,972,715	514,220	1,667,158	791,337
2021	2,986,820	516,660	1,675,068	795,091
2022	3,000,991	519,111	1,683,016	798,864
2023	3,015,230	521,574	1,691,001	802,654
2024	3,029,536	524,049	1,699,025	806,463
2025	3,043,911	526,536	1,707,086	810,289
2026	3,058,353	529,034	1,715,186	814,134
2027	3,072,864	531,544	1,723,324	817,996
2028	3,087,444	534,066	1,731,500	821,878
2029	3,102,093	536,600	1,739,716	825,777

Next, the Agency determined how drivers in each group will be affected by the change in the 30-minute break provision. The Agency assumed that drivers who drive more than 8 hours in an average shift (Group 1) will regain half of the 30 minutes (15 minutes or 0.25 hours). This assumption is based on the reality that drivers need personal time to eat, drink, etc. In addition, drivers in this category may be able to shift their break time to later in their workday by virtue of tying the break requirement to driving time instead of on-duty time. This will result in a shift in

[31] The ELD and crash datasets were merged by linking the driver identification number. Not all crashes were linked to an associated driver in the ELD dataset (meaning the duty status information for that driver was not present, or the original identifying information for the driver was incorrectly input into the dataset by the carrier). For all but one of the carriers, the match rate between the crash and ELD datasets was between 58 and 100 percent. One of the carriers match rate was 38 percent. This carrier was excluded from the analyses given the poor matching percentage.
[32] DOT FMCSA MCMIS, snapshot.

the timing of the break, and will provide increased flexibility for drivers to take their break when it is most beneficial. The Agency assumes that drivers who work more than 8 hours in an average shift but do not drive more than 8 hours (Group 2) will regain the full 30 minutes (0.5 hours) given that the duration of their driving time will not trigger the break requirement, and thus they will no longer be required to take a break. However, there is uncertainty in the number of drivers who would voluntarily elect to take the break even though they are not required to do so. Therefore, the estimate for the time saved for Group 2 is a maximum. Additionally, FMCSA assumes that the work schedule for this driver group is more flexible, and would necessitate multiple on-duty, non-driving breaks throughout the day. Drivers who work fewer than 8 hours in an average shift (Group 3) are not impacted by the previous regulation, nor will they be affected by the change in the break provision.

Using the assumptions on the time saved for each group of drivers due to the changes to the break provision in this rule, the Agency multiplied the estimated number of drivers in each group by the time savings per driver to obtain an estimate of the total hours saved per shift for each driver group. As shown in Table 5, for the first full year in which the rule will be in effect (2021), the Agency estimated that the changes to the 30-minute break provision would result in 966,699 hours saved per affected shift across all driver groups. For 2020, the rule is estimated to be in effect for the last 12 weeks of the full year which consists of 50 work weeks. The Agency estimated an average of 50 weeks per year based on the idea that most employees in the United States would take at least two weeks off for vacation or due to illness in a given year. The hours saved per affected shifts in 2020 is thus equal to roughly 24% (12 ÷ 50) of the hours saved per affected shifts over the course of a full year.

Table 5. Potential Total Hours Saved per Shift by Driver Group in 2021

Driver Group	Total Drivers per Driver Group *(A)*	Hours Saved per Affected Shift *(B)*	Total Hours Saved per Affected Shift *(C = A × B)*
Group 1	516,660	0.25	129,165
Group 2	1,675,068	0.5	837,534
Group 3	795,091	0	0
Total			**966,699**

Note: Totals may not add due to rounding.

After estimating the hours saved for the affected shifts, the Agency then determined the number of shifts that will be affected by the provision change for each driver group. For this calculation, the Agency again used VTTI data to estimate the change in the number of 30-minute breaks that occurred as a result of the 2011 HOS regulation by subtracting the average number of 30-minute off-duty breaks taken by drivers for the period before the 2011 HOS regulation went into effect from the average number of 30-minute off-duty breaks taken after the effective date of the 2011 HOS regulation, by driver group. [33] This average increase in the number of breaks per week, per driver, is shown in Column (A) in Table 6 below. The Agency then multiplied this change in the number of 30-minute off-duty breaks per week per group by an assumed 50 weeks worked per

[33] The VTTI data isolated off-duty breaks of 30 to 59 minutes as a proxy for 30-minute breaks because breaks are rarely exactly 30 minutes, and those taken to meet the requirement may be longer in duration. Thus, all breaks in this section could be between 30 and 59 minutes in length.

year. Table 6 shows the results of this calculation and the number of affected shifts per year, per driver, for each driver group.

Table 6. Annual Number of Affected Shifts per Driver, by Driver Group, in 2021

Driver Group	Average Increase in Breaks per Week *(A)*	Work Weeks per Year *(B)*	Number of Affected Shifts per Year, per Driver *(C = A × B)*
Group 1	2.4	50	120
Group 2	1.6	50	80
Group 3	1.2	50	60

The Agency then used information on the total hours saved per affected shift from Table 5 and the number of affected shifts per year, per driver, for each driver group from Table 6 to obtain the total number of hours saved for each driver group. As shown in Table 7, these calculations resulted in a total number of hours saved per year due to the changes in the break provision of 82,502,528 starting in 2021 once the rule is in effect for the full year.

It should be noted that, although the VTTI data show an increase in the average number of breaks taken per week by drivers in Group 3 (drivers who work less than 8-hour shifts on average), there are no hours saved for these shifts in the calculations shown in Table 7. Because these drivers work (and thus drive) fewer than 8 hours on average, they were not required by the 2011 HOS regulation to take a 30-minute break, and thus any change in how this group uses their break time is not attributable to the rule.

Table 7. Total Annual Hours Saved by Driver Group in 2021

Driver Group	Total Hours Saved per Affected Shift *(A)*	Number of Affected Shifts per Year *(B)*	Total Hours Saved per Year *(C = A × B)*
Group 1	129,165	120	15,499,802
Group 2	837,534	80	67,002,726
Group 3	0	60	0
Total			82,502,528

Note: Totals may not add due to rounding.

After determining the number of hours saved due to the changes in the break provision, the next step is to estimate the marginal cost of operating a CMV. The American Transportation Research Institute (ATRI) report, *An Analysis of the Operational Costs of Trucking: 2019 Update,* found that marginal operating costs were $71.78 per hour in 2018.[34] These marginal costs include vehicle-based costs (e.g., fuel costs, insurance premiums, etc.), and driver based costs (i.e., wages and benefits).

Next, the Agency estimated the profit margin for motor carriers. Profit is a function of revenue and operating expenses, and ATA defines the operating ratio of a motor carrier as a measure of

[34] ATRI. An Analysis of the Operational Costs of Trucking: 2019 Update. October 2019. Table 10, pg. 19. Available at: https://truckingresearch.org/wp-content/uploads/2019/11/ATRI-Operational-Costs-of-Trucking-2019-1.pdf (accessed December, 11, 2019). Source data are assumed to be presented in 2018 dollar terms.

profitability based on operating expenses as a percentage of gross revenues.[35] Armstrong & Associates, Inc. (2009) states that trucking companies that cannot maintain a minimum operating ratio of 95% (calculated as Operating Costs ÷ Net Revenue) will not have sufficient profitability to continue operations in the long run.[36] Therefore, Armstrong & Associates state that trucking companies need a minimum profit margin of 5% of revenue to continue operating in the future. Transport Topics publishes data on the "Top 100" for-hire carriers, ranked by revenue.[37] For 2014, thirty-nine of these Top 100 carriers also have net income information reported by Transport Topics. FMCSA estimates that the 39 carriers with both revenue and net income information have an average profit margin of approximately 4.3% for 2014. For 2018, thirty-three of these Top 100 carriers have net income information reported by Transport Topics, with an average profit margin of approximately 6% for 2018.[38] The higher profit margin experienced in 2018 is reinforced by a Forbes article that found net profit margin for freight trucking companies "expanded to 6% in 2018, compared with an annual average of between 2.5% and 4% each year since 2012."[39] It is uncertain whether the recent surge in net profit margin will continue through the analysis period, so FMCSA assumes the lower profit margin of 5% for motor carriers for purposes of this analysis.

Using the assumed profit margin of 5% for motor carriers, FMCSA estimated the revenue gained per hour for motor carriers by multiplying the marginal cost per hour by the profit margin. This calculation resulted in a profit per hour of $3.59.

Lastly, the Agency multiplied the total annual number of hours saved by the changes to the break provision by the estimated profit per hour to estimate the total annual cost savings to carriers. In 2020, FMCSA estimates that motor carriers will incur cost savings for the last 12 weeks (or 24%) of the 50-work week year. Thus, as reflected in the following table, fewer total hours are saved in 2020 than in subsequent years. This calculation resulted in total cost savings in 2021 (the first full year of the analysis period) of $296.1 million (82,502,528 hours × $3.59). FMCSA then repeated this calculation for each year of the analysis period using the estimated number of drivers in each year. As shown in Table 8, these calculations resulted in a total cost savings of $274.1 million on an annualized basis at a 7% discount rate.

[35] ATA. *American Trucking Trends 2015*. Page 79.
[36] Armstrong & Associates, Inc. *Carrier Procurement Insights*. 2009. Pages 4-5. Available at: https://www.3plogistics.com/product/carrier-procurement-insights-trucking-company-volume-cost-and-pricing-tradeoffs-2009/ (accessed January 5, 2016).
[37] Transport Topics. 2014. *Top 100 For-Hire Carriers*. Available at: http://ttnews.com/top100/for-hire/2014 (accessed November 19, 2018).
[38] Transport Topics. 2018. *Top 100 For-Hire Carriers.* Available at: https://www.ttnews.com/top100/for-hire/2018 (accessed November 19, 2018).
[39] Forbes. *Trucking Companies Hauling in Higher Sales.* Available at: https://www.forbes.com/sites/sageworks/2018/03/04/trucking-companies-hauling-in-higher-sales/#40e0012f3f27 (accessed November 19, 2018).

Table 8. Total and Annualized Motor Carrier Cost Savings due to Changes in Break Provision

Year	CMV Drivers Currently Subject to the 30-Minute Break Requirement	Total Hours Saved *(A)*	Profit per Hour *(B)*	Total Cost Savings – Undiscounted (Millions of 2017$) *(C = A × B)*	Total Cost Savings - 3% Discount Rate (Millions of 2017$)	Total Cost Savings - 7% Discount Rate (Millions of 2017$)
2020	2,972,715	27,376,449	$3.59	**($98.3)**	**($95.4)**	**($91.8)**
2021	2,986,820	82,502,528	$3.59	**($296.1)**	**($279.1)**	**($258.6)**
2022	3,000,991	82,893,979	$3.59	**($297.5)**	**($272.3)**	**($242.9)**
2023	3,015,230	83,287,288	$3.59	**($298.9)**	**($265.6)**	**($228.0)**
2024	3,029,536	83,682,462	$3.59	**($300.3)**	**($259.1)**	**($214.1)**
2025	3,043,911	84,079,512	$3.59	**($301.8)**	**($252.7)**	**($201.1)**
2026	3,058,353	84,478,446	$3.59	**($303.2)**	**($246.5)**	**($188.8)**
2027	3,072,864	84,879,272	$3.59	**($304.6)**	**($240.5)**	**($177.3)**
2028	3,087,444	85,282,000	$3.59	**($306.1)**	**($234.6)**	**($166.5)**
2029	3,102,093	85,686,640	$3.59	**($307.5)**	**($228.8)**	**($156.3)**
Total 10-Year Cost Savings					**($2,375)**	**($1,925)**
Total Annualized Cost Savings					**($278.4)**	**($274.1)**

Notes:
(a) Total cost values may not equal the sum of the components due to rounding. (The totals shown in this column are the rounded sum of unrounded components.)
(b) Values shown in parentheses are negative values (i.e., less than zero) and represent a decrease in cost or a cost savings.

Opportunity Cost Savings of the 30-Minute Break to Drivers

Time is a scarce resource and FMCSA recognizes that forced off-duty time is not always the drivers' best alternative. Some commenters said that the rigid off-duty requirement forces drivers to rest when they are not tired and later in the day penalize them for resting when they would benefit most from a break. Thus, it is reasonable to assume that the previous HOS regulations were imposing an opportunity cost on drivers that could be alleviated by providing drivers greater flexibility. In recent RIAs for non-HOS regulations, FMCSA has valued the opportunity cost of drivers' time using their wage rate. In other words, the increased flexibility provided by the rule will result in a reduction in costs, or a cost savings, to drivers equal to the number of hours saved multiplied by the driver wage rate. The Agency did not account for the opportunity cost of the driver's time in the 2011 RIA, and thus hesitates to estimate cost savings resulting from the changes in this rule.

3.1.3 Cost Impacts of Alternative 1

FMCSA considered eliminating the break requirement entirely. Drivers would still use off-duty time when needed or break-up the driving task using on-duty/non-driving time. Drivers in group 1 would likely regain 15 minutes of on-duty time, and drivers in Group 2 would likely regain 30 minutes of on-duty time. As in the preferred alternative, FMCSA assumes that drivers in group 1 would only regain 15 minutes because they need personal time to eat, drink, etc. That time would continue to be off-duty regardless of eliminating the requirement. While elimination of the break requirement would provide additional flexibility beyond the preferred alternative, FMCSA assumes it would not impact driver behavior relative to the preferred alternative, and thus would result in an equivalent motor carrier cost savings.

3.2 SLEEPER BERTH

3.2.1 Overview

Drivers qualifying for the previous HOS sleeper-berth provision in § 395.1(g)(1)(i)(A) and (ii)(A) must, before driving, accumulate the equivalent of at least 10 consecutive hours off duty. The equivalence refers to at least 8 but fewer than 10 consecutive hours in a sleeper berth, and a separate period of at least 2 hours either in the sleeper berth or off duty, or any combination thereof. This rule will continue to allow drivers using the sleeper berth to obtain their required off-duty time by taking fewer hours in the sleeper berth. However, drivers using this option will be required to obtain one consolidated period of at least 7 consecutive hours in the sleeper berth, paired with another period of at least 2 hours, such that 10 hours of off-duty time is achieved. Neither period will count against the 14-hour driving window. As with the previous HOS rules, the order of the split-rest periods does not matter.

FMCSA does not have definitive data to estimate the population of trucks equipped with sleeper berths, or the number of drivers that use the sleeper-berth provision. The VTTI data indicate that 48.6% of truck drivers in that dataset operate a vehicle with a sleeper berth and could thus potentially take advantage of the sleeper-berth provision.[40] Assuming that the percentage of drivers with a sleeper berth remains constant over time, the number of drivers affected by this change is be expected to increase each year with the increase in the number of CMV drivers.

3.2.2 Cost Impacts of the Preferred Alternative

The changes to the sleeper-berth provision in this rule allow for additional flexibility in a driver's duty day by (1) providing for an optional 1-hour reduction in the amount of time that drivers are required to spend in the sleeper berth, and (2) excluding the shorter rest period when calculating the 14-hour driving window. The changes could result in efficiency gains for drivers as they would be given increased flexibility to make the most individually optimal decisions related to their schedules on a given day. ATRI estimated cost savings of a scenario similar to the proposal.[41] The ATRI Technical Memorandum focuses on rest periods of three or more hours that would then qualify for a portion of the 10-hour rest requirement, and highlights the cost savings of increased flexibility that may be realized as a result of the changes to the sleeper-berth provision.

The ATRI analysis modeled two scenarios with a driver traveling across a heavily congested 40-mile urban corridor in Atlanta, Georgia. In the first scenario, the driver operated under the previous HOS requirements and felt the need to continue driving through congestion. In the second scenario, the driver took a four-hour rest break to avoid congestion and then continued to his/her destination. The second scenario resulted in a reduction in drive time of 45 minutes, and required 1 hour and 15 minutes less work time.

[40] VTTI. (2018). Phase II: Crash Risk by Driver Schedule. Task 3 Letter Report: Average Duty Status, Duty Period, and Status of the Hours-of-Service (HOS) Rule Change by Driver.
[41] ATRI, Technical Memorandum: Hours-of-Service Flexibility. August 2018. Available at: http://truckingresearch.org/2018/08/28/atri-hours-of-service-flexibility-technical-memo/ (Accessed on January 21, 2020).

The decrease in driving and work time occurred because the driver was able to move at a consistent speed without the starting and stopping that occurs in heavy traffic. The technical memorandum demonstrated that avoiding congestion could result in moving freight the same number of miles in fewer work hours. This could reduce fuel and vehicle costs for the motor carriers, reduce congestion for the public by removing large vehicles from the road during peak travel times, and potentially reduce the incidence of crashes related to congestion. While these impacts could result from a particular trip, FMCSA cannot estimate the magnitude or likelihood of these potential impacts for many reasons. Most notably, these impacts hinge on the availability of CMV parking, which the ATRI technical memorandum implicitly assumes is ubiquitous. FMCSA is aware that parking is not always available, especially in urban areas or heavily travelled truck routes.

Additionally, all trips do not move through heavily congested areas during peak rush-hour, and thus would not necessarily benefit from the ability to avoid congestion.

The Agency expects that carriers and drivers could realize efficiency gains by the reduction in time required to be in the sleeper berth and the exclusion of the shorter off-duty period in the calculation of the 14-hour driving window. Under the final rule, drivers will be provided the ability to choose between 2 split-rest options to meet the requirements for an equivalent of 10 consecutive hours off-duty that best fits their situation without reducing their available work time by excluding the shorter rest period from the calculation of the 14-hour driving window. A driver who uses the sleeper-berth provision today must include the shorter rest period in the calculation of the 14-hour window, resulting in an available 12 hours to complete up to 11 hours of driving. Under the rule, drivers would have an additional two hours of work time when using the sleeper-berth provision, potentially resulting in increased productivity. Using the same methodology identified in the estimate of the 30-minute break cost impact, this rule would result in a maximum of approximately $7 in motor carrier opportunity cost savings each time the provision is used ($3.59 motor carrier profit per hour × 2 hours = $7.18). FMCSA acknowledges that not every driver would need the additional two hours of productivity; thus, this is the maximum cost savings that could be achieved on a per-trip basis. FMCSA does not have information on how drivers and carriers might use this provision.

FMCSA received some information from commenters regarding how often some drivers use the previous sleeper-berth provisions and how usage might change under the new provision, with some expecting drivers to increase their usage and others expecting that the new provision will not be widely used. Despite the comments received on this issue, FMCSA still lacks definitive information that would be needed to estimate usage among the entire population of drivers. In addition, FMCSA also lacks definitive data on the number of trucks that are equipped with sleeper berths and the impact that schedule changes might have on motor carrier operations. Therefore, FMCSA did not evaluate the impacts of schedule changes that may occur as a result of this final rule.

3.2.3 Cost Impacts of Alternative 1

FMCSA also considered retaining the split option of 8/2, but excluding the shorter rest period from the calculation of the 14-hour driving window. Excluding the shorter rest period from the calculation of the 14-hour driving window would result in the same per-trip cost savings as the

preferred alternative, but would limit the drivers' flexibility. The preferred alternative will allow drivers to use a 7/3 split option and provides flexibility for drivers to shift an additional hour of their off-duty time in the most optimal way for their current situation.

3.2.4 Cost Impacts of Alternative 2

FMCSA also considered expanding the sleeper berth options to allow a 7/3 split, while continuing to count the shorter rest period in the calculation of the 14-hour driving window. Drivers making use of this alternative would then have an 11-hour window within which to drive 11 hours. This alternative provides a false sense of flexibility due to its impracticality and would limit the use of the option to those drivers who do not anticipate reaching the maximum driving or work time. Additionally, it would eliminate the potential cost savings resulting from increased productivity discussed in the preferred alternative. This alternative does not meet the Agency objective of providing drivers the ability to take needed rest breaks while ensuring opportunity for an adequate consolidated rest period.

3.3 SHORT-HAUL OPERATIONS

3.3.1 Overview

Previously, under § 395.1(e)(1), drivers did not have to prepare RODS or use an ELD if they met certain conditions, including a return to their work reporting location and release from work within 12 consecutive hours. Drivers operating under this provision were permitted a 12-hour workday in which to drive up to 11 hours (for passenger carriers, up to 10 hours) and the motor carrier must maintain time records reflecting certain information. Specifically, the motor carrier that employs the driver and utilizes this exception must maintain and retain for a period of six months accurate and true time records showing: the time the driver reports for duty each day; the total number of hours the driver is on duty each day; the time the driver is released from duty each day; and the total time for the preceding seven days in accordance with § 395.8(j)(2) for drivers used for the first time or intermittently.

Under § 395.3(a)(2) and (3), other property-carrying CMV drivers not utilizing the short-haul exception have a 14-hour driving window in which to drive up to 11 total hours. Under § 395.5(a)(1) and (2), CMV drivers operating passenger-carrying CMVs can operate for up to 15 (non-consecutive) hours after coming on duty. However, unless otherwise excepted, these drivers must maintain RODS, generally through the use of an ELD. The drivers previously qualifying for the § 395.1(e)(1) exception had the option to use the 14- or 15-hour duty day in §§ 395.3 or 395.5, but may have chosen not to use the option to avoid keeping RODS.

Additionally, drivers previously qualifying for the HOS short-haul exception must stay within 100 air miles of their work reporting location. In this rule, FMCSA extends the air-mile radius from 100 air miles to 150 air miles, consistent with the radius requirement for the other short-haul exceptions in § 395.1(e)(2).

3.3.2 Cost Impacts of the Preferred Alternative

In the ELD rule, FMCSA anticipated that all drivers employed by passenger and private non-passenger (i.e., property) carriers qualifying for the short-haul exception would be able to take

advantage of the exception.[42] However, FMCSA received comments on the HOS ANPRM from carriers discussing their business practices and normal operating conditions, and how the lack of flexibility in the 12-hour workday limits their ability to take advantage of the short-haul exception. On many shifts, drivers return to their work reporting location within 12 hours, but there are some occasions when drivers need up to an additional 2 hours in their workday. This extra time beyond 12 hours could result from detention time, longer-than-expected customer service stops, traffic, or other unforeseen events. When this occurs more than 8 days in a 30-day period, the driver must prepare daily RODS using an ELD as required by § 395.8 (a)(1)(iii)(A)(*1*). Due to the uncertainty surrounding the driver's eligibility at the beginning of the workday, the carrier may choose to have their driver operate as though he or she is not eligible for the short-haul exception. This results in unnecessary ELD expenses. One commenter to the ANPRM estimated that the proposal would reduce the required ELDs for their heavy-duty service vehicles by 84%, resulting in annual cost savings of $1.5 million. While this comment is informative and suggests that the rule would result in cost savings, FMCSA cannot extrapolate from one carrier's cost savings to determine the cost savings for all carriers. However, in the RIA for the 2013 ELD final rule, the Agency estimated the per-driver cost of ELDs to be approximately $419 annually. Therefore, those carriers who will now be able to take advantage of the short-haul exception, may experience a cost savings of $419 per driver on an annualized basis. The FMCSA asked for comments from the public on the cost savings that would be expected to result from not having to comply with the ELD requirements. Multiple commenters provided feedback noting that cost savings could range from $240 to $1,700 per truck, including the costs for purchase of the device, data maintenance, and technical support. Comments from industry associations stated that the cost saving would be at least $500 to $1,000 per truck, including costs for equipment, maintenance, repair, and back office administration. FMCSA notes that the $419 estimated in the ELD rule is within the range provided by commenters. Another commenter stated that due to the diverse nature of the motor coach industry, some segments of the driver population would continue to need ELDs, and FMCSA agrees with this comment. Due to the uncertainty surrounding the number of drivers who will now be eligible for the short-haul exception, and the number of carriers that would remove ELDs from their vehicles, FMCSA did not quantify the potential ELD-related cost savings associated with this rule.

Further, one commenter on the ANPRM explained that the increased flexibility in the air-mile radius would reduce the number of vehicles necessary for their operation, and thus would result in cost savings of approximately $1.7 million per year. Again, motor carriers are very diverse in their operating structures, and FMCSA cannot extrapolate from one carrier's cost savings to determine the cost savings for all carriers. While FMCSA expects the rule to result in cost savings for the affected entities, those impacts are not quantified.

The Agency agrees with other commenters who stated that the changes to the previous short-haul provisions would provide increased flexibility for both motor carriers and drivers who utilize the exception. The FMCSA believes that the extension of both the 12-hour limit to 14 hours, and the 100 air-mile radius to 150 air miles will provide the necessary flexibility to spend quality time

[42] DOT, FMCSA. "Regulatory Evaluation of Electronic Logging Devices and Hours of Service Supporting Documents Final Rule." November 2015. Presented in Table 10 on page 34 and discussed on page 33. Available at: https://www.regulations.gov/document?D=FMCSA-2010-0167-2281 (Accessed on: December 6, 2018).

with customers, respond to changes in market demand such as peak holiday delivery times, and reduce the administrative burden of determining how often a driver has gone beyond 12 hours or 100 air-miles in any 30-consecutive day period. However, it is important to note that the increased flexibility due to these provisions alone are insufficient to affect the volume of freight shipped or aggregate VMT meaningfully. These flexibilities would need to be coupled with changes in overall market conditions. While the changes to the short-haul exception may extend the workday for some drivers, it will not extend the workday beyond the long-haul driving window, and thus FMCSA does not believe that the rule would negatively impact safety.

3.3.3 Cost Impacts of Alternative 1

FMCSA also considered limiting the changes to the provision to an extension of the time required for drivers to return to their work reporting location from 12 to 14 hours, without changing the air-mile radius requirements. This alternative would decrease the population eligible for the short-haul exception relative to the preferred alternative by removing eligibility for those drivers operating between 100 and 150 air miles. Decreasing the population affected by the final rule would decrease any cost savings resulting from it.

3.4 ADVERSE DRIVING CONDITIONS

3.4.1 Overview

Under the previous regulations, drivers qualifying for the HOS adverse driving conditions provision in § 395.1(b)(1) could drive for no more than two additional hours beyond the maximum driving time allowed under § 395.3(a) or 395.5(a) if they encountered adverse driving conditions after dispatch. "Adverse driving conditions" are defined in § 395.2 as "snow, sleet, fog, other adverse weather conditions, a highway covered with snow or ice, or unusual road and traffic conditions, none of which were apparent on the basis of information known to the person dispatching the run at the time it was begun." The previous provision did not allow for the extension of the 14-hour driving window (or 15 hours on duty for drivers of passenger-carrying CMVs), and thus could not be used if the adverse driving condition was encountered towards the end of that period. In this rule, FMCSA allows a 2-hour extension of the 14-hour driving window (or 15 hours on duty for drivers of passenger-carrying CMVs). This change aligns the regulations with the intent of the adverse driving condition provision, which is to allow drivers flexibility when faced with unexpected conditions. This change will not increase the maximum available driving time, but may allow drivers to use more of the available driving time if the adverse condition occurs at the end of the 14-hour driving window.

3.4.2 Cost Impacts of the Preferred Alternative

The adverse driving conditions provision is intended to provide flexibility for drivers who encounter adverse driving conditions which were not apparent at the time of dispatch. However, the rigid nature of the requirement restricts the use of the provision to the earlier part of the driving window. This rule will increase flexibility by allowing drivers encountering adverse driving conditions to extend their driving window by the same two-hour window that currently applies to driving time. The changes to the adverse driving conditions provision will provide drivers with additional options to determine the best solution based on their situation. The Agency anticipates that the increased options and flexibility will result in cost savings to drivers,

but is unable to quantify these cost savings due to a lack of conclusive data regarding the use of the adverse driving provision.

FMCSA is aware of two sources of data which could provide information on the use of the adverse driving conditions provision. Data available from VTTI shows that one carrier, with ELD data from 1,000 drivers, reported the use of the adverse driving condition provision 150 times in a 6-month period. [43] However, each of the 1,000 drivers provided ELD data, but they did not report the data uniformly for the entire 6-month period. For example, some reported for the entire six-month period and some for only a portion of the time. For this reason, the total number of times the drivers indicated use of the adverse driving condition provision cannot be normalized across all 1,000 drivers in the dataset or extrapolated across the entire CMV driver population. Another source of data on the use of the adverse driving condition provision is from OOIDA, which represents more than 160,000 members. The OOIDA Foundation conducted a brief, online survey in 2018. One question on the survey, which received 675 responses, was "How often do you currently utilize the adverse driving conditions exception?" The OOIDA members used the adverse driving conditions provision 1.5 times per month on average, with a median of 0.0 times per month.[44] This result implies that at least 50% of the respondents never use the provision. The frequency of use of the adverse driving conditions provision as reported by the VTTI and OOIDA data vary widely, making it difficult for the Agency to determine actual use of the provision among the driver population. While information from ELDs could be a source of data regarding the frequency of use for the existing provision, the Agency does not have access to much of the industry ELD data. It is also not clear that use of the provision would be clearly indicated in ELD data.

FMCSA also does not have data on the increase in use that may result from this rule, but appreciates the feedback and information received from commenters regarding specific motor carrier experience with the adverse condition provision. Commenters were split on the issue, with some stating that they expect an increase in use and others not expecting to see an increase. FMCSA believes that it is not clear whether the changes will cause an industry-wide increase in use, and if so, how much. Given this uncertainty, FMCSA is unable to estimate the change in use of the adverse condition provision at this time.

Additionally, the Agency lacks information on the actual increases in efficiency that drivers experience when using the provision. The Agency expects that drivers will realize efficiency gains due to avoided losses in time spent trying to drive through adverse driving conditions or waiting for those conditions to subside, but acknowledges that each situation would be different. The changes in this final rule do not increase maximum available driving time, but may allow drivers to use the time that is available to them. For example, if a driver encounters adverse driving conditions when close to the end of the 14-hour driving window, he or she must stop driving regardless of the available driving hours remaining. Under this final rule, the driver could continue to operate for up to two additional hours beyond the 14-hour driving window. A driver may then be able to reach the intended destination prior to taking 10-hours off-duty, and the

[43] VTTI. (2018). Phase II: Crash Risk by Driver Schedule. Task 3 Letter Report: Average Duty Status, Duty Period, and Status of the Hours-of-Service Rule Change by Driver.
[44] OOIDA Foundation, Sept. 6, 2018. "Hours of Service ANPRM Survey" available at: https://www.regulations.gov/document?D=FMCSA-2018-0248-3347 (accessed on November 26, 2018).

motor carrier will experience a maximum cost savings of two additional hours of productivity. Using the same methodology identified in the estimate of the 30-minute break cost impact, this change will result in a maximum of approximately $7 in motor carrier opportunity cost savings each time the provision is used ($3.59 motor carrier profit per hour × 2 hours = $7.18). FMCSA does not have information on how drivers and carriers might use this provision.

3.5 FEDERAL GOVERNMENT ERODS SOFTWARE UPDATE COSTS

FMCSA will incur costs to update the existing eRODS software. The eRODS software is used by safety officials (Federal, State, and local safety partners) to locate, open, and review ELD output files transferred from a compliant ELD. The eRODS software consists of two components; a database and software component that together enables comparison of the compliant ELD output files with the HOS requirements. The changes to the 30-minute break requirement and sleeper-berth requirements will necessitate updates to the eRODS database that stores the HOS requirements and some minor programming changes to the compliance algorithm aspects of the software.

The Department's Volpe National Transportation Systems Center developed the eRODS software and continues to maintain and update it when needed. Volpe estimates that the final rule will result in a one-time eRODS software update costs of $20,000. This will include updating the HOS requirements database and minor programing changes to the software component which consist of five steps: developing a requirements analysis, design, coding, testing, and deployment of the updates.

3.6 TRAINING COSTS

This final rule does not mandate specific training requirements for drivers, motor carriers, or enforcement personnel, and the NPRM did not estimate familiarization costs associated with the new requirements. One commenter to the NPRM pointed out that while FMCSA did not require training for ELDs, the Agency estimated the cost associated with learning the new system. In anticipation of training enforcement personnel, FMCSA developed training materials that can be used for both enforcement personnel and drivers and discusses the cost of training below.

3.6.1 Driver Training Costs

FMCSA is not attributing driver training costs to this final rule. FMCSA notes that training costs for new entrant drivers are included in the costs estimated for the Entry-level Driver Training rule, so it would be double-counting the costs to new drivers to also include those costs in the analysis for this rule. The FMCSA also notes that motor carriers are required to train their driver employees under § 380.503(b). Therefore, existing regulations already require that drivers receive training on the HOS rules. However, for current drivers who have already been trained, this rule may necessitate some re-training to ensure that drivers are aware of changes in this rule. FMCSA has not estimated the costs of this retraining.

3.6.2 FMCSA and State Training Costs

The Agency will incur one-time costs in the first year of the analysis period for the training of enforcement personnel. The Agency intends that all training costs related to this final rule accrue in 2020. First, a contractor is developing training materials at an estimated cost of $90,000. The Agency intends to then utilize these materials and implement a "train-the-trainer" model to train inspectors in field locations. This process will involve the training of three master trainers over the course of three, eight-hour training days (24 hours in total for each master trainer). Next, the 3 master trainers will train 100 trainers from across the country, again over the course of three, eight-hour training days (24 hours in total for each trainer).

The 100 trainers will then conduct approximately 50 training sessions for 500 Federal and 10,500 State trainees in pairs (with 2 trainers per class). The trainers will conduct 4 in-person class hours and 3 hours of webinars, for a total of 7 hours for each trainer. The trainees will attend 4 in-person class hours, 3 hours of webinars, and an additional half-hour of eLearning, for a total of 7.5 hours per trainee. Table 9 shows the population for each training group as well as the estimated number of hours of training at each stage.

Table 9. Estimated Training Hours, 2020

Training Group	Number of People in Training Group *(A)*	Hours to Train a Master Trainer *(B)*	Hours to Train a Trainer *(C)*	Hours to Train a Trainee *(D)*	Total Training Hours *(E = A*B + A*C + A*D)*
Master Trainers	3	24	24	0	**144**
Trainers	100	0	24	7	**3,100**
Federal Trainees	500	0	0	7.5	**3,750**
State Trainees	10,500	0	0	7.5	**78,750**

Next, FMCSA calculated training costs by multiplying the average hourly compensation rates for each group by the total number of training hours. These calculations result in a total training cost of $18,720 for master trainers, $322,400 for trainers, $285,000 for federal trainees, and $4.5 million for State trainees, as shown in Table 10.

Table 10. Estimated Training Cost, 2020

Training Group	Average Hourly Rate *(A)*	Total Training Hours *(B)*	Total Training Cost *(C = A*B)*
Master Trainers	$130	144	**$18,720**
Trainers	$104	3,100	**$322,400**
Federal Trainees	$76	3,750	**$285,000**
State Trainees	$57	78,750	**$4,488,750**
Total Training Costs			**$5,114,870**

Next, FMCSA estimated the travel costs associated with the trainings. FMCSA assumed that the three master trainers are located near the training sites and thus will not incur travel costs. The 100 trainers, however, are from disparate locations across the country. Given the variability in

the locations of the 100 trainers, some will need to travel to the training sites, and some will not. FMCSA thus assumes a representative travel cost of $300 per trainer.

Federal and State trainees are also expected to travel within their respective State to attend the trainings given at field locations. Travel costs for Federal and State trainees will also vary based on the locations of the trainees in relation to the trainings they will attend. FMCSA again assumes a representative travel cost of $300 per trainee for Federal and State trainees. FMCSA also uses this representative $300 per trainee travel cost for the 100 trainers to travel to the training session they will be conducting. Table 11 presents the estimated travel costs for each training group.

Table 11. Estimated Travel Costs for Training, 2020

Training Group	**Number of People in Training Group** *(A)*	**Travel Costs to Train a Master Trainer** *(B)*	**Travel Costs to Train a Trainer** *(C)*	**Travel Costs to Train a Trainee** *(D)*	**Total Travel Costs** *(E = A*B + A*C + A*D)*
Master Trainers	3	$0	$0	$0	**$0**
Trainers	100	$0	$300	$300	**$60,000**
Federal Trainees	500	$0	$0	$300	**$150,000**
State Trainees	10,500	$0	$0	$300	**$3,150,000**
Total Travel Costs					**$3,360,000**

Next, FMCSA combined the costs for time spent in trainings and travel costs for each group to estimate total costs for training that are incurred as a result of the final rule. Table 12 presents these total costs for each training group, and also estimates the total one-time training costs due to the final rule.

Table 12. Total Training Costs, 2020

Training Group	**Total Training Cost** (Table 10) *(A)*	**Total Travel Costs (Error! Reference source not found.)** *(B)*	**Total Costs** *(C = A + B)*
Master Trainers	$18,720	$0	**$18,720**
Trainers	$322,400	$60,000	**$382,400**
Federal Trainees	$285,000	$150,000	**$435,000**
State Trainees	$4,488,750	$3,150,000	**$7,638,750**
Total Costs	**$5,114,870**	**$3,360,000**	**$8,474,870**

As shown in Table 13, the calculations of total training costs resulted in a total cost of $8.6 million to the Federal government for the training of enforcement personnel, or $1.1 million on an annualized basis at a 7% discount rate.

Table 13. Estimated Total Costs for Training, 2020

Training Group	Total Costs
Training Materials	$90,000
Master Trainers	$18,720
Trainers	$382,400
Federal Trainees	$435,000
State Trainees	$7,638,750
Total Costs	**$8,564,870**
Total 10-Year Cost Savings – 7% Discount Rate	**$8,004,551**
Total 10-Year Cost Savings – 3% Discount Rate	**$8,315,408**
Total Annualized Cost Savings – 7% Discount Rate	**$1,139,668**
Total Annualized Cost Savings – 3% Discount Rate	**$974,819**

3.7 TOTAL QUANTIFIED COSTS

This final rule will not result in any significant new costs for regulated entities. Instead, this rule will result in increased flexibility for drivers and a quantified reduction in costs for motor carriers. Federal and State governments will incur one-time training costs of $8.6 million for training inspectors on the new requirements. The Federal government also will incur a one-time eRODS software update cost of approximately $20,000. The change to the 30-minute break requirement will result in a reduction in opportunity cost, or a cost savings, for motor carriers. The Agency estimates the 10-year motor carrier cost savings attributable to the changes to the 30-minute break provision at $2,814.3 million (or a total 10-year motor carrier cost of -$2,814.3). As shown in Table 14, FMCSA estimates the total costs of this final rule at -$2,366.2 million (or $2,366.2 million in cost savings) discounted at 3%, and -$1.917.5 million (or $1,917.5 million in cost savings) discounted at 7%. Expressed on an annualized basis, this equates to -$277.4 million in costs (or $277.4 million in cost savings) at a 3% discount rate, and -$273.0 million in costs (or $273.0 million in cost savings) at a 7% discount rate. All values are in 2018 dollars.

Table 14. Total 10-Year and Annualized Costs of the Final Rule (in millions of 2018$)

Year	Federal and State Government Cost *(A)*	Cost due to Changes in 30-Min Break Provision *(B)*	Total Costs – Undiscounted *(C) = (A) +(B)*	Total Costs – (7% Discount Rate)	Total Costs – (3% Discount Rate)
2020	$8.6	($98.3)	**($89.7)**	($83.8)	($87.1)
2021	$0.0	($296.1)	**($296.1)**	($258.6)	($279.1)
2022	$0.0	($297.5)	**($297.5)**	($242.9)	($272.3)
2023	$0.0	($298.9)	**($298.9)**	($228.0)	($265.6)
2024	$0.0	($300.3)	**($300.3)**	($214.1)	($259.1)
2025	$0.0	($301.8)	**($301.8)**	($201.1)	($252.7)
2026	$0.0	($303.2)	**($303.2)**	($188.8)	($246.5)
2027	$0.0	($304.6)	**($304.6)**	($177.3)	($240.5)
2028	$0.0	($306.1)	**($306.1)**	($166.5)	($234.6)
2029	$0.0	($307.5)	**($307.5)**	($156.3)	($228.8)
Total 10-Year Costs				**($1,917.5)**	**($2,366.2)**
Total Annualized Costs				**($273.0)**	**($277.4)**

3.8 NON-QUANTIFIED COSTS

There are a number of other potential cost savings of this final rule that FMCSA considered which, due to uncertainty around driver behavior, could not be quantified on an industry level. FMCSA has granted 5-year exemptions from the requirement to return to the driver's normal work reporting location within 12 hours of coming on duty (examples include: National Asphalt Paving Association; Waste Management Holdings, Inc.; and American Concrete Pumping Association).[45,46,47] During the period of the exemption, all drivers utilizing it must carry a copy of the exemption notice; after that period entities seeking to maintain the exemption must reapply. This rule will result in cost savings to these (and potentially other) entities by alleviating the need to pursue the exemption process and eliminating compliance with exemption conditions such as carrying a copy of the exemption document, as well as reallocating the time and resources that would have been spent on the exemption reapplication. The Federal government will also experience a cost savings equal to the reduction in time and resources necessary to review, comment on, and make final determinations on the exemptions.

The Agency did not include the cost for ELD manufacturers to update ELD equipment or software in this RIA. A compliant ELD and its software will not need to be updated as a result of this rule. FMCSA is aware, however, that some ELD manufacturers have chosen to go beyond the minimum ELD requirements and provide additional features such as alerts when a driver may be close to an HOS violation. FMCSA acknowledges that the additional features will need to be updated as a result of the rule, or risk being inaccurate. ELD manufacturers providing these

[45] DOT, FMCSA. Federal Register Notice Docket No. FMCSA-2018-1400. January 26, 2018 available at: https://www.gpo.gov/fdsys/granule/FR-2018-01-26/2018-01400 (Accessed on November 20, 2018).
[46] DOT, FMCSA. Federal Register Notice Docket No. FMCSA-2018-0181. July 17, 2018. Available at: https://www.regulations.gov/document?D=FMCSA-2018-0181-0057 (Accessed on November 20, 2018)
[47] DOT, FMCSA. Federal Register Notice Docket No. FMCSA-2018-0175 Available at: https://www.gpo.gov/fdsys/pkg/FR-2018-11-01/pdf/2018-23881.pdf (Accessed on November 2, 2018).

features have staff that routinely provides updates and patches to their ELD software, and transmits those updates directly to the devices on-board vehicles. Many carriers have subscriptions with companies and will receive the updated software as soon as practicable. While updating ELD equipment is not a requirement or direct cost of the rule, it is an indirect cost attributable to this rule. FMCSA received comments from ELD manufacturers on the time required to make and distribute software updates, and discusses those comments in the preamble to the final rule. FMCSA did not receive comments addressing the cost of software updates, and considers updates to be part of normal business practices. Therefore, FMCSA is not estimating the cost of updating the additional ELD features in this RIA.

The Agency did not quantify impacts resulting from any potential decreases in congestion that may result from the final rule. Allowing drivers to take breaks at their convenience, such as during times of heavy traffic congestion, could allow the driver to operate at a more consistent speed without the starting and stopping that occurs in heavy traffic. An ATRI technical memorandum demonstrated that avoiding congestion could result in moving freight the same number of miles in fewer work hours. This could reduce fuel and vehicle costs for the motor carriers, congestion for the public by removing large vehicles from the road during peak travel times, and the incidence of crashes related to congestion. While these impacts could result from any individual trip, FMCSA cannot estimate the magnitude or likelihood of these potential impacts for many reasons. Most notably, these impacts hinge on the availability of CMV parking. FMCSA is aware that parking is not always available, especially in urban areas or heavily travelled truck routes.

Additional non-quantified cost savings include increased flexibility and a reduction in back office administrative costs resulting from the extension of the duty day and the air-mile radius for those operating under the short-haul exception; the increased options for drivers to respond to adverse driving conditions during the course of their duty period; and increased flexibility afforded to drivers, such as increased options with regard to on-duty and off-duty time resulting from changes to the 30-minute break requirement and the sleeper-berth provisions.

4. BENEFITS

The Agency does not anticipate that this final rule will result in new regulatory benefits. Additionally, the Agency does not believe that these changes will result in any reductions in safety or other regulatory benefits. The impacts of the rule on the benefits of the provisions are discussed below.

This chapter presents the Agency's findings on the benefits of the changes to four HOS provisions that: (1) increase flexibility for the 30-minute break rule by requiring a break after 8 hours of driving time (instead of on-duty time), and allowing the requirement to be satisfied by an on-duty break from driving rather than requiring an off-duty break; (2) modify the sleeper-berth exception to allow drivers to split their required 10-hours off duty into 2 periods, 1 of at least 7 consecutive hours in the sleeper berth and the other of not less than 2 consecutive hours, either off duty or in the sleeper berth, with neither period counting against the driver's 14-hour driving window; (3) change the short-haul exception available to certain CMV drivers by

lengthening the drivers' maximum on-duty period from 12 to 14 hours and extending the radius within which the driver may operate from 100 air miles (115.08 statute miles) to 150 air miles (172.6 statute miles); and (4) modify the adverse driving conditions exception by extending by 2 hours the maximum window during which driving is permitted. The first two items apply to drivers operating property-carrying CMVs, while the final two items apply to drivers operating either property-carrying or passenger-carrying CMVs.

4.1 30-MINUTE BREAK

4.1.1 Safety Benefit Impacts of the Preferred Alternative

The changes to the 30-minute break provision in this rule do not involve any increases in the maximum available driving time. The Agency thus believes that these changes will not have an impact on the safety benefits of the HOS rules. As discussed below, the Agency is reconsidering the value of off-duty breaks relative to on-duty breaks.

The Agency has carefully considered the views of numerous commenters requesting exemptions or removal of the 30-minute break requirement. As a result of the feedback, and after reviewing available research, FMCSA anticipates that a non-driving break, even an on-duty break, will not adversely affect safety relative to the previous requirements.

Based on comments received on the ANPRM and the NPRM, the Agency has taken another look at the Blanco, et al. (2011), study to determine the applicability of the study findings to the 30-minute break requirement.[48]

While Blanco, et al. (2011) found that off-duty breaks resulted in a greater decrease in subsequent safety critical events (SCE) than on-duty breaks, many of the breaks classified as 30-minute breaks were between 30 and 59 minutes in length, casting doubt on the findings' applicability to a strict 30-minute break.[49] Furthermore, the off-duty breaks in Blanco, et al. (2011) were voluntary, and many were taken in the sleeper berth. Both of these elements deviate from the previous environment where a rigid 30-minute rest break requirement forces drivers to go off duty regardless of whether they feel fatigued or have space to rest. Thus, the study participants could have experienced off-duty breaks that were more beneficial in nature than the off-duty breaks taken as a result of the 2011 final rule, as the study participants likely opted to take off-duty breaks as a countermeasure to fatigue.

Blanco, et al. (2011) categorized breaks from driving into four groups: Rest During Duty Period (Type 1), Work During Duty Period (Type 2), Rest During Duty Period/Off Duty (Type 3), and Off Duty (Type 4). Break Type 1 and Type 4 include resting activities such as eating and sleeping, and break Type 3 is a combination of Type 1 and Type 4 breaks such that it also includes rest activities. Blanco, et al. (2011) collected data from November 2005 to March 2007,

[48] Blanco, M., Hanowski, R., Olson, R., Morgan, J., Soccolich, S., Wu, S.C., & Guo, F. (2011) "The Impact of Driving, Non-Driving Work, and Rest Breaks on Driving Performance in Commercial Motor Vehicle Operations." Available in this rulemaking docket.

[49] In reviewing the Blanco study, it was determined that there were 3,171 breaks of 30 minutes or longer used in the analysis. It should be noted that there were relatively few off-duty breaks – only 211 off-duty breaks, which was less than 6.7 percent of the total number of breaks.

when any time spent in the vehicle cab (with the exception of the sleeper berth) was considered on-duty time. This would include in-cab activities that after 2011 could be considered off-duty, such as eating or taking naps. As such, while Blanco, et al. (2011) analyzes the reduction in SCEs for Type 1 and Type 4 breaks separately, under the present regulatory structure they would likely both be considered off-duty breaks and thus would fit into Type 4; Off-Duty Break.

Using the published data in Blanco, et al. (2011), FMCSA recalculated the magnitude of SCE reduction for an off-duty break using the break frequency published in Blanco, et al. (2011) for break Type 1, Type 3, and Type 4. This calculation resulted in a 33% magnitude of SCE reduction, which is lower than the 51% for Type 4 breaks alone, and very close to the 30% reduction for Break Type 2.[50] FMCSA acknowledges that this result is not precise due to the limitations of the available data. Multiple break types could make up a single break, such that the summation of the break frequency by type can be more than the total number of breaks, and the magnitude of SCE reduction would likely be slightly different than what was calculated above. It is clear that the magnitude of SCE reduction that Blanco, et al. (2011) attributed to off-duty breaks is larger than the SCE reduction that would be attributable to the off-duty 30-minute breaks required under the 2011 HOS rule (those that would be made up of Type 1, Type 3, and Type 4 breaks as defined by Blanco, et al. (2011)). In light of this review, it appears that FMCSA placed too great a value on off-duty breaks, compared to other types of breaks. What seems to be consistent in Blanco, et al. (2011) is that breaks of any type reduced SCEs. Therefore, the Agency is changing the break provision to allow the driver to take a break while on duty but not driving, rather than requiring the time to be off duty.

Further, the Agency is tying the break requirement to 8 hours of driving time rather than 8 consecutive hours since the driver's last off-duty or sleeper-berth period of at least 30 minutes. Based on the discussion above, FMCSA has concluded that on-duty breaks can generate essentially the same SCE reduction as off-duty breaks. Tying the break requirement to driving time is consistent with this finding. Many commenters to the ANPRM stated that the previous 30-minute break provision requires them to go off duty after 8 hours of on-duty time, even though they may not have driven for any extended period of time. FMCSA required the 30-minute break provision in the 2011 HOS rule because Blanco, et al. (2011) reported that a break from the driving task would lead to a reduction in SCEs in the hour after a break was taken. But drivers who take at least a 30-minute non-driving break (whether on or off duty) are receiving the intended benefits of the previous requirement. FMCSA continues to believe that a break from driving is important for safety but believes that this rule will be less burdensome for carriers and drivers while achieving the same goal – a break from the driving task.

FMCSA anticipates that the same level of safety can be achieved by (1) allowing the driver to take a break while on-duty but not driving, as discussed above, and (2) starting the eight-hour period when the CMV operator begins driving. This rule does not increase maximum driving time. Drivers continue to have 11 hours of available driving time. The 30-minute break can now

[50] It is FMCSA's position that a 3% difference is within the error bounds for determining impact upon crash rates. SCEs are a much more common event than crashes, which results in the likelihood that a 30% reduction and a 33% reduction in SCEs may have the same impact on overall crash rates.

be on duty, and in certain rare circumstances a driver may be able to accomplish additional driving time.[51] This will only be the case if a driver's schedule required 11 hours of driving and 3 hours of on-duty non-driving time. This is not generally the case, and, as such, the number of driving hours will not increase for most drivers. The Agency thus believes that these changes will have minimal to no impact on the safety benefits of the HOS rules.

Furthermore, the Agency has reviewed several requests for exemptions from the previous 30-minute break requirement. In certain cases, the Agency has granted limited exemptions after determining that they would not result in any decrease in safety.[52] For example, in certain cases the Agency has allowed the break requirement to be satisfied with on-duty not driving time. An exemption requires a carrier to report recordable crashes related to the exemption to the Agency. FMCSA notes that exempt carriers have reported few crashes; in any case, crashes are caused by many factors, and none has been determined to be directly attributed to an exemption.

FMCSA has analyzed MCMIS crash data to gain insight into the relationship between crash risk and one exemption in particular. On August 21, 2015 (80 FR 50912), FMCSA allowed operators of vehicles transporting certain hazardous materials (HM) to satisfy the 30-minute break requirement using attending time. This exemption was necessary because FMCSA regulations prohibit operators of vehicles transporting certain HM from leaving their vehicles unattended (§ 397.5); they could not satisfy the requirement for an off-duty break while maintaining on-duty attendance of the HM load. MCMIS contains counts of crashes where a vehicle with an HM placard was present, as well as crash counts of all large truck crashes. Using these data points, FMCSA examined the total number of crashes where a vehicle with an HM placard was present for the two years before and after the exemption went into effect. From August 22, 2013 through August 21, 2015, there were 7,217 crashes where vehicles with an HM placard were present, or 2.616 % of the total crashes involving large trucks (7,217 HM placard present / 275,915 large truck crashes). From August 22, 2015 through August 21, 2017, there were 7,277 crashes where vehicles with an HM placard were present, or 2.419 % of the total crashes involving large trucks (7,277 HM placard present / 300,775 large truck crashes). This analysis has some limitations: not all vehicles transporting HM are large trucks and crashes cannot necessarily be attributed to the exemption. Furthermore, FMCSA does not have VMT data for all large trucks carrying hazardous materials before and after the exemption. However, the slight decrease in the percentage of CMV crashes involving placarded HM compared to all large truck crashes may suggest that the "attendance" exemption did not increase crash risk for operators of vehicles

[51] Available data from VTTI shows that approximately 1% of works shifts require more than 10 hours of driving, and less than 4% of work shifts require more than 13.5 hours of on-duty and/or driving time.

[52] For more information about each of the exemptions, and the specific conditions under which they were granted, please review the following notices. ATA granted August 21, 2015 (80 FR 50912). The Department of Energy granted June 22, 2015 (80 FR 35703). The National Asphalt Paving Association granted January 26, 2018 (83 FR 35703). The National Tank Truck Carriers granted April 9, 2018 (83 FR 15221). R&R Transportation granted October 2, 2015 (80 FR 59848). The Specialized Carriers & Rigging Association granted on November 1, 2016 (81 FR 75727). The Department of Defense Surface Deployment & Distribution Command granted on October 28, 2013 (78 FR 64265). The American Concrete Pumping Association granted on March 21, 2017 (82 FR 14595). The National Pork Producers Council granted on June 11, 2014 (79 FR 33634). The California Farm Bureau Bee Transporters granted on June 19, 2015 (80 FR 35425).

transporting certain HM. FMCSA has not discovered evidence of adverse safety impacts that would require withdrawal of any 30-minute exemption.

In other cases, however, the Agency has denied requests for blanket exemptions because the applicants were unable to demonstrate how they would maintain an equivalent level of safety without the 30-minute break.[53]

FMCSA believes the increased scheduling flexibility afforded to drivers with these changes may increase their efficiency, but is unlikely to significantly affect driving hours or the amount of work completed in a shift. The changes will give drivers greater ability to plan their breaks, and allow for on-duty activities such as time spent at loading docks to fulfill the break requirement. This increased flexibility could increase VMT for an individual driver during a given shift, but would affect only the amount of work performed in shifts taking more than 13.5 hours to complete. This is because the 30-minute break during a shift that is less than 13.5 hours would not result in reaching the 14-hour limit, and thus would not limit the amount of work performed.

FMCSA analyzed recent data from VTTI and found that shifts that ran 13.5 hours or more comprise less than 4% of all shifts.[54] For these shifts that do require more than 13.5 hours of duty time to complete, the new break requirements may allow for a shift to be completed on time rather than carry over to the next duty period. However, FMCSA does not anticipate that increasing a given shift by 30 minutes of on-duty time would enable motor carriers to meaningfully increase aggregate VMT.

4.1.2 Safety Benefit Impacts of Alternative 1

Alternative 1, which would eliminate the 30-minute break requirement, is more flexible than the preferred alternative. However, eliminating the requirement would allow drivers to operate a vehicle for 11 hours without stopping. FMCSA anticipates that most drivers would take breaks to eat and rest, resulting in an equivalent level of cost savings as quantified for the preferred alternative. FMCSA considers 11 continuous hours of driving detrimental to safety, regardless of however rare of an occurrence. As such, alternative 1 may be more flexible, would result in an equivalent level of motor carrier cost savings, but would also lead to a reduction in safety benefits relative to the preferred alternative. Therefore, FMCSA did not finalize alternative 1.

[53] For more information about thesdenial, please review the request by Transco/McLane denied July 18, 2017 (82 FR 32918).
[54] For further detail on the VTTI data, see the discussion in 3.1.2 regarding the opportunity cost of the 30-minute break to motor carriers.

4.2 SLEEPER BERTH

4.2.1 Safety Benefit Impacts of the Preferred Alternative

This final rule would not increase the available driving time or extend the driving window beyond 14 hours. Additionally, as discussed both here and in the final rule, there is an extensive body of research suggesting that split-sleep schedules may improve safety and productivity compared to consolidated daytime sleep. Mollicone, et al. (2007) conducted a laboratory study of 93 healthy adult subjects to investigate physiological sleep obtained in a range of restricted sleep schedules. [55] Eighteen different conditions with restricted nocturnal anchor sleep, with and without diurnal naps, were examined. The study found that "split sleep schedules are feasible and can be used to enhance the flexibility of sleep/work schedules involving restricted nocturnal sleep due to scheduling." The authors of the study concluded that its results are generally applicable to any continuous industrial operation that involves sleep restriction, night operations, and shift work.

Belenky, et al. (2012) conducted a laboratory study on 53 healthy participants, making a between-group comparison of nighttime, split, or daytime sleep across a 5-day simulated workweek. [56] The effect of the three sleep conditions was measured by polysomnography, Psychomotor Vigilance Task, high fidelity driving simulator, Digit Symbol Substitution Test, and subjective state, as well as the long-term health-related biomedical measurements of blood glucose, IL-6, leptin, testosterone, and blood pressure. In comparison to consolidated nighttime sleep or split sleep, participants in the daytime sleep condition slept less and reported (on a subjective sleepiness scale) that they felt sleepier. With respect to total sleep time and sleepiness, the findings of this 2012 study suggest that split sleep is preferable to consolidated daytime sleep which is allowed under the both the previous and the current regulations.

Short, et al. (2015) conducted a systematic review of the sleep, sleepiness, and performance implications of limited wake shift work schedules. [57] The authors identified 20 independent studies, including 5 laboratory and 17 field-based studies focused on maritime watch keepers, ship bridge officers, and long-haul train drivers. Findings indicate that limited wake shift work schedules were associated with better sleep and lower sleepiness in the case of (1) shorter time-at-work, (2) more frequent rest breaks, (3) shifts that start and end at the same clock time every 24 hours, and (4) work shifts commencing in the daytime (as opposed to night).

Soccolich, et al. (2015) analyzed data that had been naturalistically collected during a separate study to compare driver usage of three separate restart methods under the 2005 HOS regulations: 10 consecutive hours off duty, 34 consecutive hours off duty, or the split sleeper-berth provision,

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[55] Mollicone, D.J., Van Dongen, H.P.A., Dinges, D.F. (2007). Optimizing sleep/wake schedules in space: Sleep during chronic nocturnal sleep restriction with and without diurnal naps. Acta Astronautica, 60 (2007) 354–361

[56] Belenky, G., Jackson, M.L., Tompkins, L., Satterfield, B., & Bender, A. (2012). Investigation of the effects of split sleep schedules on commercial vehicle driver safety and health. Washington, DC: Federal Motor Carrier Safety Administration.

[57] Short, M. A., Agostini, A., Lushington, K., & Dorrian, J. (2015). A systematic review of the sleep, sleepiness, and performance implications of limited wake shift work schedules. Scandinavian Journal of Work, Environment and Health, 41(5):425440.

which requires a consolidated sleeper-berth period of at least 8 hours. [58] The study also examined the relationship between the driver's choice of restart method and that driver's safety performance. Due to the naturalistic origin of the data, the drivers chose which restart method worked best for their schedule and their preference, and they were free to use any restart period at any time, as long as they complied with the applicable HOS regulations. Safety performance was determined by analyzing safety critical events alongside baseline data for each driver during the shift following their chosen restart method. After controlling for individual driver differences, Soccolich et al. (2015) found that safety performance was comparable (i.e., not significantly different) between drivers who used the sleeper-berth provision and drivers who chose either the 10- or 34- hour restart method.

The above research highlights the value of split-sleep scenarios in combating driver fatigue, but does do not directly speak to the changes in this rule, i.e., allowing a 7/3 "split" option, and not counting either rest period in the calculation of the 14-hour driving window. Under the 2003 HOS rule, which initially established the concept of the 14-hour driving window, drivers were permitted to accumulate the minimum off-duty period of 10 consecutive hours in 4 separate ways: (1) a minimum of 10 consecutive hours off duty; (2) a minimum of 10 consecutive hours in a sleeper berth; (3) by combining consecutive hours in the sleeper berth and off-duty time that total 10 hours; and (4) by combining 2 separate sleeper-berth rest periods totaling at least 10 hours, provided that neither period is less than 2 hours. The fourth option was the split sleeper-berth option at the time, which allowed drivers to split their sleeper-berth time in any combination (such as 4/6; 5/5) as long as each period was at least 2 hours, totaling a minimum of 10 hours. The rule allowed these periods to be excluded from the calculation of allowable on-duty and driving time. This approach resulted in concerns that the 2005 HOS rule intended to alleviate. The primary issue was the ability of drivers to split their rest periods into segments that did not provide for an adequate consolidated rest period, such as the 5/5 split. The 2005 HOS rule resulted in more clarity by relying on the fixed 14-hour driving window under which only a consolidated period of at least 8 hours in the sleeper berth would not be counted against the 14-hour driving window. Although comments were closely divided on the issue and research related to the length of the consolidated rest period was not definitive, the Agency limited drivers to an 8/2 spilt option.

In developing this rule, the Agency reviewed available research regarding the sleeper-berth exception that has been in place since 2005 to determine if the intention of the regulation – an adequate consolidated rest period – can be achieved while providing additional flexibility.

Research conducted prior to 2003 found that commercial drivers were getting 5.18 hours of sleep per night, on average (Mitler et al., 1997).[59] In 2003, FMCSA revised the HOS regulations to provide drivers with more opportunities for sleep. Research completed after 2003 found an

[58] Soccolich, S., Hanowski, R., & Blanco, M. (2015). Evaluating the Sleeper Berth Provision: Investigating Usage Characteristics and Safety-Critical Event Involvement. Available at: https://vtechworks.lib.vt.edu/handle/10919/73954 (accessed on June 19, 2019).

[59] Mitler, M.M., Miller, J.C., Lipsitz, J.J., Walsh, J.K., Wylie, C.D. (1997). The sleep of long-haul truck drivers. New England Journal of Medicine, 337, 755-761. Available in the docket for this rulemaking.

increase in sleep for drivers following the implementation of the 2003 HOS regulations. Hanowski et al. (2007) conducted a naturalistic driving study with 73 drivers, collecting and analyzing sleep actigraphy data to determine overall sleep quantity.[60] The study found that commercial drivers were getting more sleep under the revised HOS regulations, with an average of 6.15 hours of sleep per 24-hour period, nearly one full hour more than the average reported by Mitler et al.).

Van Dongen and Mollicone (2013) conducted a naturalistic driving study of 106 CMV drivers whose schedules included the HOS restart provision.[61] The study found that drivers obtained between 6.0 and 6.2 hours of sleep (on average) per 24 hours during duty cycles, as measured by wrist-worn actigraphy devices.

Dinges et al. (2017) conducted a naturalistic driving study to evaluate the operational, safety, fatigue, and health impacts of the HOS restart provisions.[62] A total of 235 CMV drivers, representative of the industry, contributed data while working their normal schedules, with 181 drivers completing all 5 months of the study. Drivers' sleep times were monitored with wrist-worn actigraphy devices. The study found that drivers obtained, on average approximately 6.5 hours of sleep per day during duty periods.

Finally, Sieber et al. (2014) conducted a survey of 1,670 long-haul truck drivers at 32 truck stops across the 48 contiguous United States.[63] The research team used the responses to compute prevalence estimates for self-reported health conditions and risk factors. Drivers were asked to report how many hours they slept per night, on average; researchers compared drivers' self-reported sleep durations to those reported by sampled working adults in the 2010 National Health Interview Survey. Of the 1,265 drivers that answered this question, the National Institute of Occupational Safety and Health study found that:

- 26.5% of long-haul truck drivers reported that they slept 6 hours or less per night, compared to 30.0% of the general working population;
- 51.4% of long-haul truck drivers reported that they slept 6–8 hours per night, compared to 63.9% of the general working population; and
- 22.1% of long-haul truck drivers reported that they slept more than 8 hours per night, compared to 5.0% of the general working population.

[60] Hanowski, R.J., Hickman, J., Fumero, M.C., Olson, R.L., Dingus, T.A. (2007). The sleep of commercial vehicle drivers under the 2003 hours-of-service regulations. Accident; Analysis and Prevention, 39(6), 1140-5.
[61] Van Dongen, H.P.A. & Mollicone, D.J. (2013). Field study on the efficacy of the new restart provision for hours of service. (FMCSA-RRR-13-058). Washington, DC: Federal Motor Carrier Safety Administration.
[62] Dinges, D.F., Maislin, G., Hanowski, R.J., Mollicone, D.J., Hickman, J.S., Maislin, D., Kan, K., Hammond, R.L., Soccolich, S.A., Moeller, D.D., & Trentalange, M. (2017). Commercial motor vehicle (CMV) driver restart study: Final report. (FMCSA-RRR-15-011). Washington, DC: Federal Motor Carrier Safety Administration.
[63] Sieber, W.K., Robinson, C.F., Birdsey, J., Chen, G.X., Hitchcock, E.M., Lincoln, J.E., Akinori, N., & Sweeney, M.H. (2014). Obesity and other risk factors: The National Survey of U.S. Long-Haul Truck Driver Health and Injury. American Journal of Industrial Medicine, 57, 615-626.

These studies show that long-haul truck drivers are, on average, getting more sleep than they did prior to the HOS rule change in 2003. Further, it shows that drivers are likely getting more sleep than other working adults in the United States.

Maislin et al. (2001) showed that it is possible for a person to avoid physiological sleepiness or performance deficits on less than seven hours of sleep; the subjects in this study were supplementing their sleep with longer naps later in the day.[64] Maislin found that a shorter restricted anchor sleep combined with longer naps can reduce sleepiness and performance deficits similar to longer duration anchor sleep alone. This study confirmed that total sleep time per 24-hour period is what is most important to reduce fatigue and improve performance. Rest breaks, and especially naps, are an important tool in combating fatigue, and FMCSA encourages their use. As noted in Wylie (1998), "[n]aps in trips with judged drowsiness appeared to result in recovery effect, compared to the relatively high levels of drowsiness seen in the hour prior to napping."[65] Research on napping indicates it does refresh a driver and improves performance in the near term. Caldwell et al. (1997) found that their subjects performed better after napping compared to after only resting without sleep.[66] Garbarino et al. (2004) found that, in addition to working as a short-term countermeasure to fatigue experienced during normal working hours, napping "before night work can be an effective countermeasure to alertness and performance deterioration."[67] Naps do not have to be long to improve performance. Sallinen et al. (1997) found that naps of less than 1 hour most influenced performance, and a survey of train engineers found that 20-minute napping was effective for enhancing alertness (Moore-Ede et al., 1996). [68, 69]

The research discussed above demonstrates that drivers are getting adequate sleep, and that allowing a 7/3 split option will continue to provide the opportunity for a consolidated sleep period commensurate with current levels of sleep for truck drivers. The 7/3 split option will allow for additional flexibility to obtain restorative rest depending on individual differences, resulting in more efficient use of drivers' time. Further, by excluding the shorter rest period from the calculation of the 14-hour driving window, a driver has the ability to obtain needed rest without using available work time.

FMCSA does not believe that the available research supports either a 6/4 or a 5/5 split option. Drivers are currently typically obtaining more than 6 hours of sleep during a 24-hour period, and neither the 6/4 nor the 5/5 split options would provide opportunity to maintain the current levels.

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[64] Maislin, G., Rogers, N.L., Price, N.J., Mullington, J.M., Szuba, M.P., Van Dongen, H.P.A., and Dinges, D., (2001) Response Surface Modeling of the Effects of Chronic Sleep Restriction with and Without Diurnal Naps – Report. Available in the docket for this rulemaking.

[65] Wylie, D. (1998) Commercial Motor Vehicle Driver Drowsiness, Length of Prior Principal Sleep Periods, and Naps – Report. Available in the docket for this rulemaking.

[66] Caldwell, J.S., et al. (1997). The Efficacy of Hypnotic-Induced Prophylactic Naps for the Maintenance of Alertness and Performance in Sustained Operations – Report. Available in the docket for this rulemaking.

[67] Garbarino, S., et al. (2004) Professional Shift-Work Drivers Who Adopt Prophylactic Naps Can Reduce the Risk of Car Accidents During Night Work - Report Abstract. Available in the docket for this rulemaking.

[68] Sallinen, Harma, M., Åkerstedt, T., Rosa, R., Lillqvist, O. (1997) Can a Short Napbreak Improve Alertness in a Night Shift? – Report. Available in the docket for this rulemaking.

[69] Moore-Ede, M., Mitchell, R.E., Heitmann, A., Trutschel, U., Aguirre, A., Hajamavis, H. (1996) Canalert '95 - Alertness Assurance in the Canadian Railways – Report. Available in the docket for this rulemaking.

This rule will ensure that drivers using the sleeper berth to obtain the minimum off-duty time have at least one consolidated rest period of a sufficient length to have restorative benefits to fatigue. This rule intends to provide drivers with the flexibility to make decisions regarding their rest that best fit their individual needs while continuing to prohibit potential overly-long periods of wakefulness and duty hours that could lead to fatigue-related crashes.

As discussed extensively in the preamble to the final rule, the Agency reviewed the comments received and studies provided and has determined that the change will not result in adverse safety outcomes. The available studies on sleeper berth use highlight the fact that the split sleeper-berth option is a viable and safe alternative to a minimally compliant, consolidated break of 10 consecutive hours. This final rule retains a sleeper-berth period of sufficient length for drivers to have the opportunity for rest, and when combined with the shorter rest period ensure drivers will continue to have 10 hours of time during each day when they are relieved of all responsibility for performing work. The previous sleeper-berth rule excluded from the 14-hour driving window the required 8-hour period in the berth. The NPRM proposed a similar exclusion not only for the proposed seven-hour period in the berth, but also for the shorter qualifying off-duty period of at least two hours. Advocates for Highway and Auto Safety argued that none of the studies cited by the Agency speak to the risks of allowing drivers to operate later into their duty period. It is true that no studies examine the specific parameters of the sleeper-berth rule proposed in the NPRM, but the absence of academic research exactly on point does not prohibit the Agency from using its own expertise and judgment to promulgate regulations. In this case, FMCSA balanced the industry's desire for added operational flexibility against its overriding responsibility for motor carrier safety, and concluded that the shorter off-duty period (expanded by 50% from the previous rule) would afford drivers an opportunity for rest sufficient to counteract any fatigue effects associated with the extended duty day. In fact, we believe that exclusion of the shorter period will promote more effective rest since drivers need no longer worry that the 14-hour clock is ticking away potential work time while they try to rest. And, unlike the "pause" proposed in the NPRM (which the Agency has not adopted), this measure is available only to drivers who use sleeper berths and are thus experienced in obtaining rest in a variety of places. As such, the Agency anticipates that the increased flexibility in this rule will not affect the safety outcomes achieved by the previous sleeper-berth provision.

The NPRM requested comment on whether the changes to the sleeper berth provision would result in increases in VMT. Commenters provided feedback explaining all possible outcomes of the rule's effect on VMT. FMCSA believes that these changes will increase the ability of drivers to take rest periods when they can find a safe place to park, to schedule drive time during non-peak hours, and to avoid conditions such as traffic, weather, and road closures. FMCSA agrees with commenters that these efficiencies could allow driver mileage to vary in a given work shift or week. In terms of net impacts of the changes to VMT, driving hours, and work schedules, it is important to remember that the changes adopted in this final rule will not directly affect the volume of freight shipped or aggregate VMT. While these and other changes to the HOS rules may shift freight loads between drivers and carriers, those changes are not expected to affect the total economic demand for the movement of freight. It is possible that the additional flexibilities due to this rule will allow carriers to respond more readily to demand shifts when they occur. However the specific contribution of this increased flexibility would be dwarfed by overall economic circumstances in measuring the effects of this rule on the volume of freight shipped or aggregate VMT.

4.2.2 Safety Benefit Impacts of Alternative 1

Alternative 1, which would maintain an 8/2 split option but exclude the shorter rest period from the calculation of the 14-hour driving window, allows fewer options for drivers to split their 10 hours of off-duty time and is thus more restrictive than the preferred alternative. Based on the research discussed above, a 7/3 split option would allow for an adequate consolidated rest period without impacting safety relative to an 8/2 split option. Alternative 1 would reduce cost savings associated with the rule without providing additional safety benefits compared to the preferred alternative. Therefore, FMCSA did not finalize alternative 1.

4.2.3 Safety Benefit Impacts of Alternative 2

Alternative 2, which would allow a 7/3 split option but include the shorter rest period in the calculation of the 14-hour driving window, is more restrictive than the preferred alternative, and would reduce cost savings attributable to the final rule. Blanco et al. (2011) showed that the SCE rate increased modestly with increasing work and driving hours, but also found that breaks can be used to counteract the negative effects of time-on-task. The results from the break analyses indicated that significant safety benefits can be achieved when drivers take breaks from driving. FMCSA believes that the shorter rest break will have fatigue-reducing effects regardless of whether it is included in the calculation of the 14-hour driving window, and thus alternative 2 would not provide additional safety benefits relative to the preferred alternative. As such, alternative 2 would be more restrictive, would reduce cost savings associated with the rule, and would not provide any additional safety benefits relative to the preferred alternative. Therefore, FMCSA did not finalize alternative 2.

4.3 SHORT-HAUL OPERATIONS

4.3.1 Safety Benefit Impacts of the Preferred Alternative

The Insurance Institute for Highway Safety (IIHS) conducted a study in 2017 and found that interstate truck drivers operating under the short-haul exception had a crash risk 383% higher than those not using the exception.[70] IIHS recommended that, due to this finding, the Agency should not propose an extension of the short-haul exception from 12 to 14 hours. The case-control study sampled serious crashes of large trucks operated in North Carolina by interstate carriers. The entire study, which controlled for roadway exposure differences, collected data including large truck crashes occurring from September 2010 to December 2012 and saw 198 serious crashes, of which 48 were by trucks with a short-haul exemption. FMCSA reviewed the study and noted that, while the finding was statistically significant, it was based on a very small sample size, which prevented the author from estimating a matched-pair odds ratio restricted to drivers operating under a short-haul exception, and was not nationally representative. Further, the authors noted that other related factors unobserved in the study may have led to this result. For example, it is possible that older or more poorly maintained trucks are used in local

[70] IIHS (2017) Teoh, Eric. (2017) "Crash Risk Factors for Interstate Large Trucks in North Carolina." Available at: https://www.ncbi.nlm.nih.gov/pubmed/28882260.

operations. Regardless, because FMCSA's number one priority is safety, the Agency investigated the safety implications of the changes in this rule using available data.

Congress passed the Fixing America's Surface Transportation (FAST) Act on December 4, 2015.[71] Among other things, it exempted drivers of ready-mixed concrete delivery trucks from the requirement to return to work after 12 hours of coming on duty. Beginning on December 5, 2015, operators of concrete mixer trucks met the requirements for the short-haul exception if they returned to their normal work reporting location within 14 hours after coming on duty. MCMIS contains data on crashes based on vehicle type, allowing the Agency to isolate crashes involving concrete mixer trucks both before and after the congressionally mandated changes to the short-haul exception that mirror this rule for all short-haul operators.

The Agency first focused on the time of day when crashes occurred. Assuming that the majority of concrete mixer trucks are operated on a schedule with a workday that begins in the morning hours and ends in the evening hours, those crashes that occur in the later part of the day would occur towards the end of the 12- or 14-hour workday for the concrete mixer driver. FMCSA found that the percent of concrete mixers in crashes at later hours of the day (5:00 pm to 11:59 pm, when drivers are more likely to be close to their maximum hours for the day) has been declining in recent years, falling from 7.6% in 2013 to 5.8% in 2017.

FMCSA also examined the total number of crashes that involved concrete mixer trucks for the two years before and after the congressionally mandated change went into effect. From December 4, 2013 through December 3, 2015, there were 2,723 concrete mixers involved in crashes, or 0.907% of the total large trucks involved in crashes (2,723 concrete mixers involved in crashes / 300,324 large trucks, including concrete mixers, involved in crashes). From December 4, 2015 through December 2, 2017, there were 2,955 concrete mixers involved in crashes, or 0.919% of the total large trucks involved in crashes (2,955 concrete mixers involved in crashes / 321,471 large trucks, including concrete mixers, involved in crashes). A Chi-square test suggests that this very minor increase in the concrete mixer share of the total is not statistically significant at the $p<0.05$ level. Both of the analyses suggest that the implementation of the FAST Act on December 4, 2015, did not increase the share of concrete mixers involved in large truck crashes when extending the short-haul exception requirement from 12 to 14 hours.

Some commenters to the NPRM did not agree with the Agency's use of the concrete mixer analysis discussed above based on its lack of direct correlation to the short-haul population. FMCSA did not claim that the analysis is definitive, or that the population of concrete mixers is representative of all short-haul operations. Instead, the analysis was offered as the best available data with a before and after comparison of changes similar to those proposed in the NPRM. FMCSA did not receive comments with additional data on the impact that the proposal would have on crash rates.

As noted above, FMCSA does not anticipate that extending the air-mile radius will result in increased VMT. The extension will afford drivers additional flexibility and allow carriers to reach customers farther from the work reporting location while maintaining eligibility for the short-haul exception. Extending the air-mile radius will not extend the duty day nor will it extend

[71] FHWA. 2015. FAST Act. Available at, https://www.fhwa.dot.gov/fastact/legislation.cfm

the maximum driving time. Rather, more carriers serving customers in the 100 to 150-mile range from their work reporting location might use the short-haul exception. Carriers will have the flexibility to meet customer needs more efficiently while maintaining eligibility for the short-haul exception. While more drivers or more trips will now be eligible for the short-haul exception, and thus excluded from the requirement to take a 30-minute break or prepare daily RODS, the total costs of freight transportation will likely not change to such an extent that the quantity of trucking services demanded will increase.

FMCSA does not anticipate that the changes in this final rule would lower costs or prices to such an extent that it would stimulate demand in the freight market, but acknowledges that freight loads may shift from one carrier or driver to another. Because total VMT is not expected to increase, and the changes to the short-haul exception will not extend the workday beyond the current long-haul driving window, the Agency does not anticipate changes in exposure or crash risk.

Additionally, the Agency emphasizes the changes to the short-haul exception in this rule will not allow any additional drive time during the duty day, or allow driving after the 14th hour from the beginning of the duty day. The employer must maintain accurate time records showing when the driver reports for work and is released from duty each day. Therefore, FMCSA anticipates that this rule will not affect the crash risk of drivers operating under the short-haul exception.

4.3.2 Safety Benefit Impacts of Alternative 1

Alternative 1, which would extend the time required for drivers to return to their work reporting location from 12 to 14 hours, but continue to maintain a 100 air-mile radius requirement, would reduce the population of drivers eligible for the short-haul exception. As discussed above, FMCSA does not anticipate that changing the air-mile radius from 100 to 150 air-miles will impact safety. Alternative 1 would thus be more restrictive, would reduce cost savings associated with the rule, and would not provide any additional safety benefits relative to the preferred alternative. Therefore, FMCSA did not finalize alternative 1.

4.4 ADVERSE DRIVING CONDITIONS

4.4.1 Safety Benefit Impacts of the Preferred Alternative

The Agency defines adverse driving conditions in § 395.2 as "snow, sleet, fog, other adverse weather conditions, a highway covered with snow or ice, or unusual road and traffic conditions, none of which were apparent on the basis of information known to the person dispatching the run at the time it was begun." The proposal to extend the driving window by 2 hours during adverse driving conditions was intended to alleviate the situation where drivers might feel pressure to rush to stay ahead of unexpected bad weather or make up for lost time toward the end of a shift, with the 14-hour window threatening to close. The Agency believes that this rule will reach this goal by allowing drivers added time to park and wait out the adverse driving condition, or perhaps to drive more slowly with a reduced risk of crashes. While the Agency is not aware of any research specific to the impact of adverse driving conditions on crash risk, the flexibility provided in the rule will allow drivers to make decisions based on current conditions without

penalizing them by "shortening" their driving window. Further, the Agency stresses that this rule will not increase maximum available driving time beyond that allowed under the current regulations, but may increase driving hours by allowing some drivers to use more of their available driving time.

The NPRM inquired whether drivers would use the additional time in the driving window to increase their vehicle miles traveled. Commenters provided a variety of responses, but clear data showing the impact of the rule on VMT was not provided. Ultimately, drivers and motor carriers will react to – not plan for – each unique set of circumstances. By their very nature, adverse driving conditions are unpredictable, and thus motor carriers will not be able to plan in advance for additional deliveries or trips, which would likely severely restrict any impacts on truck VMT. As a result, FMCSA did not estimate an increase in VMT resulting from the changes to this provision.

The Agency is unable to quantitatively assess the impacts on safety from this rule due to a lack of data regarding the use of the adverse driving provision. The Agency also lacks data on the relationship between crash risk and adverse driving conditions, and potential reductions in crash risk that result from the avoidance of these conditions.

4.5 HEALTH IMPACTS

The RIA for the 2011 HOS final rule estimated health benefits in the form of decreased mortality risk based on decreases in daily driving time, and possible increases in sleep. The changes were largely based on limiting the use of the 34-hour restart provision. That provision, however, was removed by operation of law when the study required by the 2015 DOT Appropriations Act failed to find statistically significant benefits of the 2011 limitations on the 34-hour restart.[72] This rule does not affect the reinstated original 34-hour restart provision, and thus the health benefits estimated in the 2011 RIA will not be affected by this rule.

As it pertains to this final rule, FMCSA anticipates that some drivers will experience a decrease in stress, which could lead to increases in health benefits. As discussed previously in this RIA, drivers have repeatedly provided comments relating to stress resulting from the rigid 14-hour driving window. The sleeper-berth provision could alter drivers' schedules relative to the previous requirements, by allowing drivers' flexibility to rest, without penalty, when they are tired or need to avoid heavy traffic. However, this provision will continue to allow for an adequate consolidated rest period. This rule retains the existing limits on driving and work time, but could allow for changes in the number of hours driven or worked on any given day. The flexibilities in this rule are intended to allow drivers to shift their drive and work time under the HOS rules in an effort to mitigate the impacts of unpredictable variables (e.g., traffic, weather, and detention times). Total hours driven or worked could increase or decrease on a given day, but FMCSA does not anticipate that these time shifts will negatively impact drivers' health. Instead, this rule will empower drivers to make informed decisions based on the current situation, and as a result could lead to a decrease in stress and subsequent health benefits.

[72]See 1.1 Background and Description of this Proposed Rulemaking, above.

FMCSA also notes that the effect of specific regulatory changes on driver health is difficult to evaluate, first, because most health effects have multiple causes and are discernible only over extended time periods, and, second, because a cause-and-effect relationship between a rule and a given health outcome may be difficult to establish. As pointed out in the 2005 HOS final rule, attempts to create a dose-response curve for the effects of exposure to diesel exhaust have not produced clear-cut results (70 FR 49978, 4983, August 25, 2005). Such an attempt would be even more difficult for the incremental HOS changes promulgated today.

FMCSA believes that the changes made by this final rule are safety- and health-neutral. For example, the expansion of the short-haul radius from 100 to 150 air-miles and of the workday from 12 to 14 hours simply gives short-haul carriers the same driving limit and driving window that other carriers have utilized for many years (without a distance limit). The 11- and 14-hour HOS limits now applicable to both short- and long-haul carriers are consistent with the statutory obligation to protect driver safety and health (49 U.S.C. 31136(a)(2), (4)), as shown by the extensive discussion in the 2005 HOS final rule (70 FR 49978, 49982 et seq.).

4.6 TOTAL BENEFITS

The Agency does not anticipate that this final rule will result in new regulatory benefits, or in any change to safety or other existing regulatory benefits. The provisions in this rule do not allow for increases in maximum available driving time, and the changes also provide drivers with additional flexibility to be able to take breaks when they are tired. The changes to the 30-minute break provision will allow drivers to take on-duty breaks, but, as discussed previously, the Agency is reconsidering the value of off-duty breaks relative to on-duty breaks and, in this rule, has focused on a targeted approach of achieving a break from driving. As such, FMCSA does not anticipate that any of the changes will affect the safety benefits of the HOS rules.

5. REGULATORY FLEXIBILITY ACT ANALYSIS

The Regulatory Flexibility Act of 1980 (RFA) (5 U.S.C. 601, et seq.), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA) (Pub. L. 104–121, 110 Stat. 857), requires Federal agencies to consider the impact of their regulatory actions on small entities, analyze effective alternatives that minimize small entity impacts, and make their analyses available for public comment. The term "small entities" means small businesses and not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations under 50,000.[73] Accordingly, DOT policy requires an analysis of the impact of all regulations on small entities, and mandates that agencies strive to lessen any adverse effects on these entities. Section 605 of the RFA allows an Agency to certify a rule, in lieu of preparing an analysis, if the rulemaking is not expected to have a significant economic impact on a substantial number of small entities.

FMCSA developed an Initial Regulatory Flexibility Analysis (IRFA) for the NPRM, and reviewed comments in response to the IRFA. A comment received on the NPRM from the Small Business Administration's (SBA) Office of Advocacy noted the regulatory relief that this rule will provide for drivers needing additional flexibility in their schedule due to unforeseeable driving conditions or for other reasons. The regulatory relief for small entities afforded by this rule was also noted in a comment received on the NPRM from the Petroleum Marketers Association of America. However, one commenter to the NPRM noted that the IRFA had too narrow a focus on the industries affected by the rule, and did not consider other industries besides Truck Transportation (NAICS Subsector 484) that would be affected by the changes to the HOS provisions. In response to this comment, FMCSA evaluated small entities potentially impacted by the rule in an expanded set of industries conducted at the level of two-digit the North American Industry Classification System (NAICS) sectors.

This rule affects drivers, motor carriers, and Federal and State governments. Drivers are not considered small entities because they do not meet the definition of a small entity in Section 601 of the RFA. Specifically, drivers are considered neither a small business under Section 601(3) of the RFA, nor are they considered a small organization under Section 601(4) of the RFA. Federal and State governments do not meet the definition of a small entity because they are governmental jurisdictions with populations greater than 50,000.

The SBA defines the size standards used to classify entities as small. SBA establishes separate standards for each industry, as defined by NAICS. In the NPRM, FMCSA estimated that the motor carriers that would experience regulatory relief under the rule would be in industries within Subsector 484 (Truck Transportation). These industries include General Freight Trucking (4841) and Specialized Freight Trucking (4842). Subsector 484 has an SBA size standard based on annual revenue of $27.5 million.

The SBA defines the size standards used to classify entities as small. SBA establishes separate standards for each industry, as defined by the NAICS.[74] This rule could affect many different

[73] RFA, Pub. L. No. 96-354, 94 Stat. 1164 (codified at 5 U.S.C. § 601, et seq.).
[74] Executive Office of the President, OMB. "North American Industry Classification System." 2017. Available at: https://www.census.gov/eos/www/naics/2017NAICS/2017_NAICS_Manual.pdf (accessed January 15, 2020).

industry sectors in addition to the Transportation and Warehousing sector (NAICS sectors 48 and 49); for example, the Construction sector (NAICS sector 23), the Manufacturing sector (NAICS sectors 31, 32, and 33), and the Retail Trade sector (NAICS sectors 44 and 45). Industry groups within these sectors have size standards for qualifying as small based on the number of employees (e.g., 500 employees), or on the amount of annual revenue (e.g., $27.5 million in revenue). In order to determine the NAICS industries potentially affected by this rule, FMCSA cross-referenced occupational employment statistics from BLS with NAICS industry codes.

FMCSA examined data from the U.S. Census Bureau to determine the number of small entities within the identified NAICS industry groups. The Census Bureau collects and publishes data on the number of firms, establishments, employment, annual payroll, and estimated receipts by enterprise employment size.[75] The most recent data available are from the 2012 County Business Patterns and the 2012 Economic Census.[76] The firms and establishments are grouped by the employment size of the enterprise, all within 4-digit NAICS industry groups. The largest employment size group is 500+ employees per enterprise. The table also provides the employment and receipts at *establishments* within each enterprise employment size category. Because there are no data available on the revenue per enterprise or the number of employees per enterprise (although these data are available at the establishment level), FMCSA identifies the number of establishments that would be considered small based on SBA size standards.

For industries with an employee-based size standard, the number of small establishments was identified based on the employment groupings of the enterprise. The enterprises employment size groups are as follows: 0-4, 5-9, 10-19, 20-99, 100-499, and 500+. When a size standard fell within a defined enterprise employment size group, the entire group was considered small. For example, if the size standard was 250 employees, all establishments within the 100-499 employment size group, as well as smaller employment size groups, were counted as small. This results in an overestimation in the number of establishments that are considered small, as some establishments within the employment size group would not be small.

For industries with a revenue-based size standard, the number of establishments within each enterprise employment size group was divided by the estimated receipts for those establishments. This provided the estimated average revenue per establishment within each enterprise employment size group. If this value was below the revenue size standard, then all establishments within that enterprise employment size group, and all smaller enterprise employment size groups, were considered to be small for purposes of the analysis.

Table 15 presents the NAICS sectors determined by FMCSA to be affected by this rule along with information on the number of firms in the industry, the percent of firms determined to be

[75] An enterprise (or "company") is a business organization consisting of one or more domestic establishments that were specified under common ownership or control. The enterprise and the establishment are the same for single-establishment firms. Each multi-establishment company forms one enterprise – the enterprise employment and annual payroll are summed from the associated establishments. An establishment is a single physical location where business is conducted or where services or industrial operations are performed.
[76] U.S. Department of Commerce, U.S. Census Bureau. Enterprise Statistics. *Table 2: Selected Enterprise Statistics by Employment Size by Sector in the U.S.: 2012. Release date June 15, 2016*. Available at: http://www2.census.gov/econ/esp/2012/esp2012_table2.xlsx (accessed January 17, 2020).

small entities based on the industry-specific size standards, and the estimated number of small entities.

Table 15. Percent and Number of Small Firms in Affected NAICS Sectors

NAICS Sector	Meaning of NAICS Sector	Number of Firms *(A)*	Percent of Small Entities[1] *(B)*	Number of Small Entities[2] *(C = A x B)*
11	Agriculture, Forestry, Fishing and Hunting	12,486	100%	12,454
21	Mining, Quarrying, and Oil and Gas Extraction	22,306	97%	21,627
23	Construction	641,808	100%	641,808
31	Manufacturing	33,952	97%	32,999
32	Manufacturing	54,120	93%	50,121
33	Manufacturing	87,153	98%	85,300
42	Wholesale Trade	145,904	79%	114,828
44	Retail Trade	333,358	98%	327,856
45	Retail Trade	131,034	99%	130,091
48	Transportation and Warehousing	53,098	99%	52,697
49	Transportation and Warehousing	15,720	92%	14,458
51	Information	39,642	96%	38,229
53	Real Estate and Rental and Leasing	4,197	100%	4,197
54	Professional, Scientific, and Technical Services	583,762	100%	583,762
55	Management of Companies and Enterprises	26,819	100%	26,819
56	Administrative and Support and Waste Management and Remediation Services	326,379	100%	326,379
61	Educational Services	34,654	100%	34,654
62	Health Care and Social Assistance	402,594	100%	402,576
71	Arts, Entertainment, and Related Industries	92,857	100%	92,857
72	Arts, Entertainment, and Related Industries	446,097	100%	446,097
81	Public Administration	366,008	100%	366,008

[1]Values in the table are rounded to the nearest whole percent for display purposes. The "Number of Small Entities" in Column (C) is the product of unrounded values.

FMCSA does not have exact estimates on the per-motor carrier impact of this rule. The RIA for this final rule estimates cost savings associated with the changes to the 30-minute break requirement. For illustrative purposes, FMCSA developed a per-driver annual cost savings estimate. As shown in Table 16, a firm with one driver could expect a cost savings of approximately $127 in 2021, the first full year of the analysis.

Table 16. Weighted Annual Per-Driver Cost Savings of the Changes to the 30-Minute Break Requirement

Driver Group	Hours Saved per shift[(a)]	Shifts per year[(b)]	Annual Hours Saved per Driver[(c)]	Annual Per-Driver Cost Savings[(d)]	% of Total Hours[(e)]
Group 1	0.25	120	30	$99.98	19%
Group 2	0.50	80	40	$133.30	81%
Group 3	0.00	60	0	$0	0%
Weighted Annual Per-Driver Cost Savings				**$127.04**	

[(a)]See Table 5 in the RIA
[(b)]See Table 6 in the RIA
[(c)]Hours Saved per Shift × Annual Hours Saved per Driver
[(d)]Annual Hours Saved per Driver × $3.33 Motor Carrier Profit Margin
[(e)]See Table 7 in the RIA, Total Hours Saved per Year, by Group ÷ Total Hours Saved per Year for All Groups

The RFA does not define a threshold for determining whether a specific regulation results in a significant impact. However, the SBA, in guidance to government agencies, provides some objective measures of significance that the agencies can consider using.[77] One measure that could be used to illustrate a significant impact is labor costs, specifically, if the cost of the regulation exceeds 1% of the average annual revenues of small entities in the sector. Given the average annual per-entity impact of $127.04, a small entity would need to have average annual revenues of less than $12,704 to experience an impact greater than 1% of average annual revenue, which is an average annual revenue that is smaller than would be required for a firm to support one employee. Therefore, this rule does not have a significant impact on the entities affected.

6. UNFUNDED MANDATES REFORM ANALYSIS

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531-1538) requires Federal agencies to assess the effects of their discretionary regulatory actions. In particular, the Act requires agencies to prepare a comprehensive written statement for any proposed or final rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $165 million (which is the value equivalent of $100 million in 1995, adjusted for inflation to 2018 levels) or more in any one year. Because this rule will not result in such an expenditure, a written statement is not required. However, the Agency does discuss the costs and benefits of this rule elsewhere in this RIA.

[77] SBA, Office of Advocacy. "A Guide for Government Agencies. How to Comply with the Regulatory Flexibility Act." 2017. Available at: https://www.sba.gov/sites/default/files/advocacy/How-to-Comply-with-the-RFA-WEB.pdf (accessed on January 16, 2020).

7. EXECUTIVE ORDER 13771 (REDUCING REGULATION AND CONTROLLING REGULATORY COSTS)

E. O. 13771, Reducing Regulation and Controlling Regulatory Costs, was issued on January 30, 2017 (82 FR 9339, Feb. 3, 2017). E.O. 13771 requires that, for every one new regulation issued by an Agency, at least two prior regulations be identified for elimination, and that the cost of planned regulations be prudently managed and controlled through a budgeting process. Final implementation guidance addressing the requirements of E.O. 13771 was issued by OMB on April 5, 2017.[78] OMB guidance defines what constitutes an E.O. 13771 regulatory action and an E.O. 13771 deregulatory action, provides procedures for how agencies should account for the costs and cost savings of such actions, and outlines various other details regarding implementation of E.O. 13771.

This final rule will have total costs less than zero, and, therefore qualifies as an E.O. 13771 deregulatory action. The present value of the cost savings of this final rule, measured on an infinite time horizon at a 7% discount rate, expressed in 2016 dollars, and discounted to 2020 (the year the final rule will go into effect and cost savings will first be realized), is $4,105 million. On an annualized basis, these cost savings are $287 million.

For the purpose of E.O. 13771 accounting, the April 5, 2017, OMB guidance requires that agencies also calculate the costs and cost savings discounted to year 2016. In accordance with this requirement, the present value of the cost savings of this rule, measured on an infinite time horizon at a 7% discount rate, expressed in 2016 dollars, and discounted to 2016, is $3,132 million. On an annualized basis, these cost savings are $219 million.

[78] Executive Office of the President. OMB. *Memorandum M-17-21. Guidance Implementing Executive Order 13771*. April 5, 2017.

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