# NIOSH Center for Motor Vehicle Safety

## **Performance Measures:** Evaluation of Strategic Plan for Research and Prevention, 2014-2018

The ***NIOSH Center for Motor Vehicle Safety Strategic Plan for Research and Prevention, 2014-2018*** set performance measures for each of the Center for Motor Vehicle Safety's (CMVS) 5 strategic goals. This document displays the CMVS Lead Team's final assessment of progress in meeting performance measures for each strategic goal. Each performance measure is rated as: Not Met, Partially Met, or Met or Exceeded. A Partially Met rating required funding of a project, initiating work under an existing project, or completing work addressing a part of the performance measure.

**Centers for Disease Control and Prevention**
National Institute for Occupational Safety and Health

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# Goal 1

## Identify risk factors for work-related crashes

*continued >*

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 1.1.1:** By 2018, complete at least two research projects addressing the role of operating environment factors on work-related motor vehicle crashes. Publish results. | ● | Law enforcement motor vehicle safety: Findings from a statewide survey [NIOSH publication]<br>Addressing occupational safety and health hazards in oil & gas drilling & servicing [Completed project] |
| **Performance Measure 1.1.2:** By 2018, complete at least two research projects or analyses related to hours of work, long hours of driving, or fatigue to provide evidence-based recommendations, particularly for workers not covered by FMCSA regulations. | ◗ | Factors associated with truck crashes in a large cross section of commercial motor vehicle drivers [Journal article]<br>The influence of daily sleep patterns of commercial truck drivers on driving performance [Journal article] |
| **Performance Measure 1.2.1-1:** By 2014, publish one methods paper on case identification and data linkage procedures in a peer-reviewed journal. | ● | Work-related fatal motor vehicle traffic crashes: Matching of 2010 data from the Census of Fatal Occupational Injuries and Fatality Analysis Reporting System (CFOI/FARS) [Journal article] |
| **Performance Measure 1.2.1-2:** By 2015, submit a second publication based on matched CFOI and FARS data to a peer-reviewed journal. | ◗ | Analysis of CFOI/FARS matched data [Conference presentations]<br>Analysis of CFOI/FARS data on seat belt use in fatal crashes [Conference presentations] |
| **Performance Measure 1.2.1-3:** By 2017, submit a third publication to a peer-reviewed journal based on analysis of matched CFOI and FARS for later data years. | ◗ | Analysis of CFOI/FARS data for the construction and oil & gas industries [Conference presentations] |
| **Performance Measure 1.2.2-1:** By 2016, initiate at least one research project to identify and evaluate sources of exposure data estimates. | — | |
| **Performance Measure 1.2.2-2:** By 2018, if initial efforts are successful, begin to develop annual exposure estimates on work-related trips or miles traveled. | — | |

Performance Measures Status Key:

— Not Met | ◗ Partially Met | ● Met or Exceeded

# Goal 1

## Identify risk factors for work-related crashes

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 1.2.3:** By 2018, publish at least one manuscript on risk factors for work-related crashes based on the analysis of naturalistic driving data. | ● | Gap acceptance during lane changes by large-truck drivers—an image based analysis [Journal article]<br><br>The influence of daily sleep patterns of commercial truck drivers on driving performance [Journal article] |
| **Performance Measure 1.3.1:** By 2018, influence standards and regulations applicable to work-related motor vehicle safety, through direct participation on standards committees or contributions to responses to regulatory initiatives by other agencies. | ● | Member of task groups that revised American National Standards Institute/American Society of Safety Professionals (ANSI/ASSP) Z15.1 – 2017 standard, *Safe Practices for Motor Vehicle Operations* and task groups that drafted Z15.3 technical report on automated vehicles.<br><br>Data from the NIOSH National Survey of Long-haul Truck Driver Health and Injury supported Federal Motor Carrier Safety Administration rulemaking to require seat belt use by all passengers in large trucks. |

Performance Measures Status Key:

— Not Met | ◗ Partially Met | ● Met or Exceeded

# Goal 2

## Apply engineering and technology-based safety interventions

*continued >*

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 2.1.1:** By 2018, develop and disseminate materials on the responses of specialized work vehicle operators to driver assistance systems or road safety information systems, and the criteria for effective systems. | ◗ | Modeling an advanced curve over-speed warning system for fire trucks [Conference presentation]<br>Preventing emergency vehicle crashes: Status and challenges of human factors issues [Journal article] |
| **Performance Measure 2.1.2:** By 2018, transfer new knowledge and best practices on at least two effective interventions on driver assistance or road safety information systems to manufacturers and organizations that use specialized work vehicles. | ◗ | Reducing firefighter vehicle crashes: Simulation and intervention [Funded project] |
| **Performance Measure 2.1.3:** By 2018, develop and disseminate materials on practices used by specialized work vehicle operators to acquire information on intersection configurations and make decisions on maneuvering through intersections and traffic light systems. | ◗ | Best-practice guidelines for occupational driver safety at intersections [Funded project] |
| **Performance Measure 2.1.4:** By 2018, transfer new knowledge and best practices on at least two effective interventions on driving assistance systems or road safety information systems associated with intersection safety to manufacturers of specialized work vehicles and organizations that use them, to reduce intersection crash incidents. | — | |
| **Performance Measure 2.2.1-1:** By 2014 and 2018, establish national anthropometric databases of fire fighters and emergency medical services personnel, respectively. | ● | Firefighter body dimensions for updating safety specifications for fire apparatus and firefighter protective equipment [Research dataset]<br>Anthropometric data for the EMTs in the United States [Research dataset] |
| **Performance Measure 2.2.1-2:** By 2015, develop and disseminate a sourcebook to assist users of the national anthropometric database of truck drivers. | ● | Anthropometric study of U.S. truck drivers: Methods, summary statistics, and multivariate accommodation models [NIOSH publication] |
| **Performance Measure 2.2.2:** By 2016, develop and disseminate materials on at least two improved interventions for fire apparatus. | ● | Seat and seatbelt accommodation in fire apparatus: Anthropometric aspects [Journal article]<br>Sizing firefighters: Method and implications [Journal article] |

Performance Measures Status Key:

— Not Met | ◗ Partially Met | ● Met or Exceeded

# Goal 2

## Apply engineering and technology-based safety interventions

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 2.2.3:** By 2017, transfer at least two human factors engineering recommendations or interventions to improve the design of fire apparatus, use of protective measures, and standards/specifications for fire apparatus. | ◗ | Two fire apparatus manufacturers are prototyping new designs based on NIOSH recommendations. |
| **Performance Measure 2.3.1:** By 2015, complete impact tests and update crashworthiness data related to biomechanical loading and injury risk to occupants of at least one type of specialized work vehicle. | ● | Impact and crashworthiness testing was used to develop guidelines shown for Performance Measures 2.3.2 and 2.3.3. |
| **Performance Measure 2.3.2:** By 2017, develop guidelines and at least three engineering recommendations to reduce biomechanical loading and injury risk to occupants during crash and rollover incidents of at least one type of specialized work vehicle. | ● | *Guidelines and standards incorporating NIOSH crash test data:*<br>General Services Administration Star-of-Life Ambulance Purchase Specification, KKK-A-1822F, Change Notice 9 (2016)<br>National Fire Protection Association Automotive Ambulance Standard, NFPA 1917 2nd Edition (2016)<br>Commission for Ambulance Accreditation Services (CAAS) Ground Vehicle Standard GVS V1.0 (2016) |
| **Performance Measure 2.3.3:** By 2017, transfer at least two human factors engineering recommendations or vehicle configuration improvements into safety standards/specifications for at least one type of specialized work vehicle. | ● | SAE J3026 Ambulance Patient Compartment Seating Integrity and Occupant Restraint standard, based on NIOSH research.<br>SAE J3027 Ambulance Litter Integrity, Retention, and Patient Restraint standard, based on NIOSH research. |
| **Performance Measure 2.4.1:** By 2017, publish a document on new technologies found in vehicles used for work purposes, challenges and risks associated with introducing these technologies, and research ideas on best safety practices. | ◗ | Member of task group that drafted Z15.3 technical report on automated vehicles. |
| **Performance Measure 2.4.2:** By 2016, initiate at least one research project assessing the effectiveness of automated vehicle functions or connected-vehicle technologies for reducing crash risk for specialized work vehicles. | ● | Reducing firefighter vehicle crashes: Simulation and intervention [Funded project]<br>Evaluation of commercial vehicle active safety systems and their effect on truck driver behavior [Funded project] |

Performance Measures Status Key:

— Not Met | ◗ Partially Met | ● Met or Exceeded

# Goal 3

## Promote evidence-based policies and practices

*continued >*

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 3.1.1:** By 2016, initiate at least two research projects to assess the effectiveness of road safety interventions. | ● | Evaluation of an in-vehicle monitoring system (IVMS) to reduce risky driving behaviors [Journal article]<br>Analysis of company fleet safety management data to guide research and prevention [Conference presentations] |
| **Performance Measure 3.1.2:** By 2016, publish a peer-reviewed paper and one trade-journal article to report driver training methods evaluation results. | ◗ | Online training for law enforcement to reduce risks associated with shift work and long work hours [Funded project]<br>Ongoing analysis of driver training and crash data for a large corporate fleet |
| **Performance Measure 3.1.3:** By 2016, initiate at least one research project to assess safety climate and culture as determinants of workplace road safety intervention success or failure. | ● | Analysis of relationship between safety climate and driving behavior of long-haul truck drivers [Conference presentation] |
| **Performance Measure 3.1.4:** By 2018, initiate research to validate fleet safety management audit tools. | ● | Using Z15.1 standard as a fleet safety audit tool [Conference presentations and webinars]<br>Analysis of the relationship between collision metrics and safety management practices [Conference presentation] |
| **Performance Measure 3.2.1:** By 2016, develop a guide to help employers justify the economic and occupational safety benefits of a motor vehicle safety program. | — | Business case calculator for road safety strategies developed, but did not meet expectations for usability |
| **Performance Measure 3.2.2:** By 2016, develop and distribute tools to support monitoring of workplace road safety performance. | — | |
| **Performance Measure 3.2.3:** By 2017, initiate a project to assess the integration of motor-vehicle safety management programs into occupational safety and health management systems. | — | |
| **Performance Measure 3.2.4:** By 2018, publish a peer-reviewed paper and one trade-journal article to report the results of economic research on road safety management programs. | — | |

Performance Measures Status Key:

— Not Met | ◗ Partially Met | ● Met or Exceeded

# Goal 3

## Promote evidence-based policies and practices

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 3.3.1:** By 2018, incorporate NIOSH input into fleet safety management standard revisions to either ANSI Z15.1 or ISO 39001. | ● | Member of task group that revised American National Standards Institute/American Society of Safety Professionals (ANSI/ASSP) Z15.1 – 2017 standard, *Safe Practices for Motor Vehicle Operations.*<br>Served on the U.S. committee for the International Organization for Standardization (ISO) 39001 standard, *Road-Traffic Safety Management Systems – Requirements and Guidance for Use.* |

Performance Measures Status Key:

— Not Met | ◗ Partially Met | ● Met or Exceeded

# Goal 4

## Share NIOSH research with global partners

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 4.1.1-1:** Strengthen research coordination through international organizations and nongovernmental organizations with global reach. | ◗ | Contributed to voluntary global road safety targets and indicators for 2020-2030 developed by the World Health Organization.<br>International Association of Oil and Gas Producers: Land Transportation Safety Recommended Practice: Implementing an In-Vehicle Monitoring Program — a Guide for the Oil and Gas Extraction Industry |
| **Performance Measure 4.1.1-2:** Expand collaborations to developing nations and emerging markets. | ◗ | Worked with the Institute of Road Traffic Education in India to evaluate training for heavy-goods vehicle drivers and build capacity for fleet safety management by transport operators. |
| **Performance Measure 4.1.2-1:** Establish partnerships for translation of NIOSH publications to other languages. | ◗ | Distracted driving GIF [Spanish version]<br>Older drivers in the workplace [Spanish version] |
| **Performance Measure 4.1.2-2:** By 2018, regularly update social media channels with new and noteworthy research results and injury prevention messages for global stakeholders. | ◗ | CDC Business Pulse: Motor vehicle safety at work [CDC Foundation publication]<br>NETS' Comprehensive Guide to Road Safety™ |
| **Performance Measure 4.1.3-1:** Strengthen participation in globally-recognized organizations. | ● | Promoted work-related road safety globally in support of the UN Decade of Action for Road Safety 2011-2020 as a member of the UN Road Safety Collaboration and co-chair of its Work-related Road Safety Project Group.<br>Served on the U.S. committee for the International Organization for Standardization (ISO) 39001 standard, *Road-Traffic Safety Management Systems – Requirements and Guidance for Use.* |
| **Performance Measure 4.2.1:** By 2016, publish a peer-reviewed paper comparing sources of data on work-related crashes around the world. | — | |
| **Performance Measure 4.2.2:** By 2016, publish at least two peer-reviewed papers on truck driver safety in India. | — | |

Performance Measures Status Key:

— Not Met | ◗ Partially Met | ● Met or Exceeded

# Goal 5

## Communicate safety and policy recommendations

| Performance Measures | Status | Examples |
|---|---|---|
| **Performance Measure 5.1.1-1:** By 2014, use one social media channel to communicate research results and injury prevention messages. | ● | @NIOSH_MVSafety [Twitter]<br>*1,097 followers as of December 2018* |
| **Performance Measure 5.1.1-2:** By 2015, use at least three social media channels to communicate research results and injury prevention messages. | ● | National Institute for Occupational Safety and Health [Facebook]<br>@NIOSH_MVSafety [Twitter]<br>nioshusa [Instagram] |
| **Performance Measure 5.1.1-3:** By 2018, regularly update social media channels with new and noteworthy research results and injury prevention messages. | ● | Workplace safety communication campaigns should be driven by employer, industry, workflow, and culture [NIOSH Science Blog]<br>Tweet at least twice per week |
| **Performance Measure 5.1.2:** By 2015, publish first eNewsletter to external stakeholders. | ● | Behind the Wheel at Work [eNewsletter]<br>*26,440 subscribers as of December 2018* |
| **Performance Measure 5.1.3:** By 2015, publish redesigned "Motor Vehicle Safety" webpage. | ● | Motor Vehicle Safety at Work [Webpage] |
| **Performance Measure 5.1.4:** By 2015, prepare an audience analysis for NIOSH information products on prevention of work-related crashes. | ● | NIOSH Center for Motor Vehicle Safety: Needs assessment and audience analysis [Contract report] |
| **Performance Measure 5.2.1:** By 2016, incorporate collaborative research and prevention activities into existing agreements with at least two partners, or initiate new agreements. | ● | Worked with the U.S. Bureau of Labor Statistics to analyze matched data to identify and characterize risk factors for U.S. fatal occupational motor vehicle crashes.<br>Worked with the National Highway Traffic Safety Administration to strengthen workplace crash data and enhance motor vehicle safety of emergency responders. |
| **Performance Measure 5.2.2:** By 2015, summarize the results of one NIOSH research study to disseminate through communication channels of trade associations and professional organizations. | ● | Research in brief: Motor vehicle safety for law enforcement officers– Still a priority [Journal article]<br>Survey Results Highlight Long-Haul Truck Driver Safety Issues [Blog post] |

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