



# NIOSH Traumatic Injury Strategic Goals

## NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH STRATEGIC PLAN FOR THE TRAUMATIC INJURY RESEARCH PROGRAM August 7, 2009

### *Mission Statement:*

The mission of the NIOSH traumatic injury (TI) research and prevention program is to reduce the incidence of traumatic occupational injuries and deaths through a focused program of surveillance, research and prevention. The program strives to fulfill its mission through the following:

- **High Quality Research:** NIOSH applies the public health approach to identifying and addressing the most compelling traumatic injury risks facing workers across all sectors. Injury and fatality surveillance identifies, characterizes, prioritizes, and tracks injuries and fatalities; case investigations and analytic epidemiologic, social science, and engineering research discover risk and causal factors; protective technology research identifies, develops, and assesses prevention options; and evaluation research determines program and intervention efficacy.
- **Practical Solutions:** The NIOSH traumatic injury research and prevention program is committed to the development of practical solutions to the complex problems that cause traumatic injuries and deaths among workers.
- **Partnerships:** Collaborative efforts in partnership with labor, industry, government, and other stakeholders are usually the best means of achieving successful outcomes. Fostering these partnerships is a cornerstone of the NIOSH traumatic injury research and prevention program.
- **Research to Practice (r2p):** Our research must be prevention oriented and lead to effective, practical prevention measures that can be implemented in workplaces. Every research project within the NIOSH traumatic injury research and prevention program includes a strategy to promote the transfer and translation of research findings into effective, feasible prevention practices, products, and technologies that will be adopted in the workplace.

***Background of the TI Research Program:***

Definition and scope of the program area: Traumatic occupational injury is defined as any damage inflicted to the body by energy transfer during work with a short duration between exposure and the health event. Traumatic injuries at work remain a leading cause of death and disability among U.S. workers. NIOSH relies heavily on hazard, injury and fatality surveillance to identify and track traumatic injury problems in specific worker populations, and to establish research priorities. On average, nearly 15 workers in the United States die each day from injuries sustained at work. Daily, an estimated 11,500 private-sector workers have a nonfatal work-related injury or illness, and more than half will require job transfer, work restrictions, or time away from their jobs as a result. More than 9,000 workers are treated in emergency departments each day, and approximately 200 of these workers are hospitalized. In 2006, workers' compensation costs for employers totaled \$88 billion.

**Fatal Occupational Injuries**

There were 5,703 fatal work injuries in the United States in 2006, down slightly from the revised total of 5,734 fatalities in 2005. The rate of fatal work injuries in 2006 was 3.9 per 100,000 workers, down from a rate of 4.0 per 100,000 in 2005.

Fatalities: Tables 1 and 2 present the Number and Rate per 100,000 Workers (respectively) of Fatal Occupational Injuries by Industry Sector for 2004 and 2005

*Table 1. Number of Fatal Occupational Injuries by Industry Sectors—2004, 2005*

Industry Sector	Number of Fatal Injuries	
	2004	2005
Services	1518	1494
Construction	1268	1238
Transportation, Warehousing and Utilities	931	967
Agriculture, Forestry, and Fishing	663	718
Wholesale and Retail Trade	576	602
Manufacturing	459	394
Mining	152	159
Healthcare and Social Assistance	131	119
<b>Total</b>	<b>5698</b>	<b>5691</b>

**Source: BLS Census of Fatal Occupational Injuries ([www.bls.gov/iif](http://www.bls.gov/iif))**

*[Notes: Industry was unknown for 5 fatalities. Government workers are distributed across the sectors according to the industry of the agency.]*

Table 2. Rate of Fatal Occupational Injuries by Industry Sectors—2004, 2005

Industry Sector	Rate of Fatal Injuries (# per 100,000 workers)	
	2004	2005
Agriculture, Forestry, and Fishing	28.0	31.6
Mining	23.4	25.5
Transportation, Warehousing and Utilities	12.8	13.1
Construction	11.8	11.1
Wholesale and Retail Trade	2.9	2.8
Manufacturing	2.6	2.4
Services	2.5	2.2
Healthcare and Social Assistance	0.9	0.7

**Source:** BLS Census of Fatal Occupational Injuries ([www.bls.gov/iif](http://www.bls.gov/iif))

*[Notes: Industry was unknown for 5 fatalities. Fatalities associated with events or exposures of bodily reaction and exertion (8) and other events or exposures (3) were excluded from the event categories. Government workers are distributed across the sectors according to the industry of the agency.]*

### Nonfatal injuries

The Bureau of Labor Statistics (BLS) estimated that there were 3.8 million nonfatal occupational injuries in 2007 occurring at a rate of 4 cases per 100 full-time equivalent workers. Of these injuries, 30% were attributed to goods producing industries and 70% were attributed to service providing industries. The top three industries in the nonfatal injury distribution were manufacturing (19%), health care and social assistance (17%), and retail trade (15%). The BLS data are based on a survey of employers that excludes an estimated 22% of US workers, including the self-employed, private household workers, farms with fewer than 11 employees, and government employees.

To help fill gaps in data on nonfatal occupational injuries, NIOSH conducts: 1) surveillance of occupational injuries and illnesses treated in a nationally-representative sample of hospital emergency departments through a work supplement to the National Electronic Injury Surveillance System (NEISS-Work), and 2) periodic surveys of farm operators and workers. In 2004, there were an estimated 3.4 million nonfatal occupational injuries and illnesses treated in hospital emergency departments at a rate of 2.5 cases per 100 fulltime equivalent workers. Injuries and illnesses are not separately classified in NEISS-Work data; it is estimated that 90-95% of all cases are injuries. Workers aged less than 25 years had the highest rates.

Based on NIOSH/National Agricultural Statistics Service (NASS) surveys of farm operators in 2001 and 2004, there were an estimated 83,940 nonfatal injuries per year among adults 20 years and older in agriculture production. The corresponding injury rate for the 2 years combined was 4.8/100 workers/year.

### **Emerging Issues**

NIOSH uses multiple on-going surveillance systems to identify significant emerging needs or trends associated with work-related traumatic injuries. These surveillance systems monitor fatal and nonfatal injury trends so that a proactive research response can be formulated to appropriately utilize scarce resources. NIOSH conducts fatality investigations of selected work-related deaths through the Fatality Assessment and Control Evaluations (FACE) program and also funds a State-based FACE program. The targets for investigation are shifted to address previously unaddressed problems and new problems as they emerge. These surveillance and investigation programs play a critical role in identifying significant emerging research areas that are especially relevant to the NIOSH traumatic injury research mission.

### **Relevant Priority Populations**

Occupational hazards are known to be distributed differentially, and workers of specific age, gender, social, and/or economic characteristics are more likely to have increased risks of work-related diseases and injuries. The relative proportions of high risk and vulnerable populations (such as older workers and minorities) within the U.S. workforce are increasing, and it is important to focus on these populations, particularly as they have been largely underserved in the past. Older workers are at greatly increased risk of work-related injury fatalities. Younger workers are also at increased risk of work-related injury because they often have limited job knowledge, training, and skills.

### **The Strategic Plan for the NIOSH Traumatic Injury Research and Prevention Program was developed to:**

- Focus program activities in directions that are likely to advance the program's mission
- Provide guidance to NIOSH intramural and extramural scientists when conceptualizing and planning research projects and activities
- Help management make decisions about the direction of the program given finite resources
- Plan program activities by taking into account external factors that impact the program and the stakeholders affected by the program, and
- Facilitate coordination of programs within the NIOSH portfolio

The NIOSH Traumatic Injury Research Program conducts surveillance, research and prevention activities to address occupational injuries and fatalities due to falls in the workplace, motor vehicle incidents, workplace violence, machines and industrial vehicles, and hazards among high risk and vulnerable worker groups.

The NIOSH Traumatic Injury strategic, intermediate, and activity/outcome goals are cross-referenced to relevant NORA Industry Sector Council strategic goals. The cross references are contained in brackets that immediately follow the goal statement. The following key provides the coding scheme for the cross-referencing citations:

Type of Goal	Abbreviation
Strategic Goal	SG
Intermediate Goal	IG
Activity/Output Goal	AOG

### **Definitions**

**Strategic Goal:** Strategic goals are the top-level goals in strategic plans. A strategic goal is a statement of a specific desired change in the social system. We strongly encourage the use of strategic goals that articulate reductions in occupationally-related illnesses, injuries, and/or hazardous exposures. *Example: Reduce work-related asthma in manufacturing industries.*

**Intermediate Goal:** Intermediate goals are the desired activities that organizations or individuals undertake with the research or public health practice outputs created by the program. If possible, an intermediate goal should state both the stakeholder actor and the research or public health output the stakeholder will use. *Example: Veteran’s Administration hospital management will adopt recommended work practices to reduce WR asthma.*

**Activity/Output Goal:** Activity/Output goals are statements of desired program activities, including outputs and transfers to stakeholders. They include goals to create tools, controls, guidelines, training materials, recommendations, new knowledge, surveillance systems, documents, policies, conferences, etc. *Example: Complete study of productivity changes related to adoption of [proven control technology] by surgical services departments.*

**Bracketed reference numbers:** When appropriate, corresponding strategic goals from other NIOSH Sector and Cross-sector Programs are denoted following the TI Goal number for purposes of cross-reference and promotion of inter-Program coordination.

## **Strategic Goal 1 (09PPTRISG1): Reduce Fall Injuries in the Workplace**

### **Strategic Subgoal 1a (10PPTRISG1a): Reduce Fall Injuries in the Construction Industry [CON SG 1.0]**

*Intermediate Goal 1a.1 (10PPTRIIG1a.1): Construction organizations, engineers, architects, and employers in the construction industry will implement effective, evidence-based fall prevention and protection designs, technologies, programs, and communications materials for their structure design and at their worksites. [CON IG 1.1]*

**Activity/Output Goal 1a.1.1(10PPTRIAOG1a.1.1):**Collaborate with occupational safety professionals, trade associations, and safety equipment manufacturers to develop effective strategies, protective technologies, and personal protection equipment for preventing fall incidents and protecting workers. [CON IG 1.1]

**Activity/Output Goal 1a.1.2(10PPTRIAOG1a.1.2):**Collaborate with technology development organizations to test the feasibility of incorporating advanced technologies into existing elevation-access equipment to improve fall incident controls.

**Activity/Output Goal 1a.1.3 (10PPTRIAOG1a.1.3):** Collaborate with occupational safety professionals, trade associations, insurance companies, and other Government agencies to transfer fall prevention knowledge and innovations to employers. [CON r2pG 1.1.3; CON IG 1.2; CON r2pG 1.2.6]]

**Activity/Output Goal 1a.1.4 (10PPTRIAOG1a.1.4):** Collaborate with architect and engineering professional organizations to transfer safe-by-design innovations and knowledge to architects, engineers, and construction corporations to incorporate them in structure design and construction plans. [CON IG 1.4; CON r2pG 1.4.3; SG 13.0]]

*Intermediate Goal 1a.2 (10PPTRIIG1a.2): Safety research organizations, trade associations, insurance companies, and employers will identify, characterize, and reduce fatal and serious injuries associated with construction falls to a lower level among Hispanic construction workers. [CON SG 12.0]*

**Activity/Output Goal 1a.2.1 (10PPTRIAOG1a.2.1):**Explore and evaluate the effectiveness of new types of construction-tailored interventions to address Hispanic worker fall risks. These might include creative mechanisms involving community-based organizations, peer-to-peer networks, family-based measures, or similar efforts as well as policy initiatives. [CON RG 12.2.6]

**Activity/Output Goal 1a.2.2 (10PPTRIAOG1a.2.2):** Transfer new knowledge and best practices on fall prevention to construction special trade contractors, general building contractors, small employers and companies who employ Hispanic construction workers. [CON IG 12.3]

**Activity/Output Goal 1a.2.3 (10PPTRIAOG1a.2.3):** Document effectiveness of implementation of fall prevention measures reflecting critical risk factors and obstacles to Hispanic construction workers.

## **Strategic Subgoal 1b (10PPTRISG1b): Reduce Fall Injuries in the Health Services Industry**

***Intermediate Goal 1b.1 (10PPTRIIG1b.1): The health services industry will implement comprehensive slip, trip, and fall (STF) prevention programs.***

**Activity/Output Goal 1b.1.1 (10PPTRIAOG1b.1.1):** Conduct intervention trials in health care settings to evaluate the effectiveness of STF prevention measures.

**Activity/Output Goal 1b.1.2 (10PPTRIAOG1b.1.2):** Develop hazard assessment checklists for use by the health care industry to identify STF hazards in health care settings addressing the most common STF hazards.

**Activity/Output Goal 1b.1.3 (10PPTRIAOG1b.1.3):** Develop evidence-based findings on how to implement a comprehensive slip, trip, and fall prevention program in health care settings that can serve as the basis of a national STF prevention campaign.

## **Strategic Subgoal 1c (10PPTRISG1c): Reduce Fall Injuries in the Wholesale and Retail Trade (WRT) Industry [WRT SG 2]**

***Intermediate Goal 1c.1 (10PPTRIIG1c.1): Engineers, WRT trade associations, and employers in the WRT industry will implement effective, evidence-based fall prevention and protection designs, technologies, programs, and communication materials for the handling, storage and retrieval of merchandise.***

**Activity/Output Goal 1c.1.1 (10PPTRIAOG1c.1.1):** Collaborate with researchers, WRT trade associations, worker groups, occupational safety and health professionals, and manufacturers of safety and health equipment to evaluate and develop effective strategies and technical engineering solutions for storage and retrieval of merchandise, goods, and materials to reduce fall-from-elevation incidents.

**Activity/Output Goal 1c.1.2 (10PPTRIAOG1c.1.2):** Collaborate with technology development organizations to test the feasibility of

incorporating advanced technologies into existing elevation-access and merchandise retrieval equipment to improve fall incident controls.

**Activity/Output Goal 1c.1.3 (10PPTRIAOG1c.1.3):** Collaborate with occupational safety professionals, WRT trade associations, and insurance companies to transfer fall prevention knowledge, innovations, and guidelines to the WRT industry and small business employers. [WRT IG 2.3]

## **Strategic Subgoal 1d (10PPTRISG1d): Reduce Fall Injuries in the Public Safety, Services, Manufacturing and other high risk Industries**

*Intermediate Goal 1d.1 (10PPTRIIG1d.1): Government agencies, vehicle and equipment manufacturers, standards committees, and occupational safety professionals will work together to improve the designs of ambulances, fire trucks, and heavy trucks to reduce the risk of injuries and fatalities associated with falls from these vehicles.* [SPS IG 3.3; TWU IG 1.14]

**Activity/Output Goal 1d.1.1 (10PPTRIAOG1d.1.1):** Evaluate ingress/egress designs of ambulances, fire trucks, and heavy trucks; work with equipment manufacturers to review and consider design enhancement. [SPS TG 3.3.2; TWU 1.14.2]

**Activity/Output Goal 1d.1.2 (10PPTRIAOG1d.1.2):** Work with national standard groups to update or develop ingress/egress design standards for specific motor vehicles.

**Activity/Output Goal 1d.1.3 (10PPTRIAOG1d.1.3):** Develop and disseminate guidelines for ingress/egress use and modifications to reduce slips, trips, and falls among EMS personnel, firefighters, and truck drivers. [SPS TG 13.1.3; TWU 1.14.1]

*Intermediate Goal 1d.2 (10PPTRIIG1d.2): The food services industry and other high risk industries will implement comprehensive slip, trip, and fall (STF) prevention programs.* [TWU IG 1.15, IG 1.18, IG 1.21; IG 1.23; IG 1.28]

**Activity/Output Goal 1d.2.1 (10PPTRIAOG1d.2.1):** Identify STF prevention strategies and research gaps that need to be addressed in the food services and other industries.

**Activity/Output Goal 1d.2.2 (10PPTRIAOG1d.2.2):** Develop and evaluate promising solutions for STF prevention in the food services industry.

**Activity/Output Goal 1d.2.3 (10PPTRIAOG1d.2.3):** Conduct intervention trials in the food services industry to evaluate the effectiveness of STF prevention measures.

**Activity/Output Goal 1d.2.4 (10PPTRIAOG1d.2.4):** Develop hazard assessment checklists for use by the food services industry to identify the most common STF hazards.

**Activity/Output Goal 1d.2.5 (10PPTRIAOG1d.2.5):** Develop evidence-based guidelines for preventing STF incidents in the food services industry that can serve as the basis of a national STF prevention campaign.

**Strategic Subgoal 1e (10PPTRISG1e): Reduce fall injuries through research on human characteristics and on biotechnology-based fall control measures.**

*Intermediate Goal 1e.1 (10PPTRIIG1e.1): Researchers will identify biomedical information of humans to design out fall risk or craft engineering solutions to control worker fall risk.*

**Activity/Output Goal 1e.1.1 (10PPTRIAOG1e.1.1):** Collaborate with other federal agencies to improve understanding of how individual worker characteristics contribute to fall incidents and to the design of effective fall protection devices. This should include exploration of physical variations, neurological traits, cognition process, social and cultural factors, and safety attitudes.

**Activity/Output Goal 1e.1.2 (10PPTRIAOG1e.1.2):** Study elderly workers' physical and cognitive constraints associated with falls and the mechanisms through which elderly workers at increased risk for fall injury, and develop a guideline to address risk of occupational fall as a result of decreased ability to perform their job tasks and respond to non-routine situations.

*Intermediate Goal 1e.2 (10PPTRIIG1e.2): Manufacturers will produce and market new, improved fall protection devices and systems that effectively reduce the forces to the human body during fall arrest and fall termination.*

**Activity/Output Goal 1e.2.1 (10PPTRIAOG1e.2.1):** Collaborate with manufacturers of safety equipment to test the effectiveness of new strategies, technologies, sensors (such as visual cue design and shoe characteristics and material properties) in reducing postural instability at elevation to reduce fall-initiation risk.

**Activity/Output Goal 1e.2.2 (10PPTRIAOG1e.2.2):** Collaborate with manufacturers of safety equipment to develop improved sizing systems

and configurations of fall protection devices to accommodate current worker population, including female workers, for improved fall protection.

**Activity/Output Goal 1e.2.3 (10PPTRIAOG1e.2.3):** Collaborate with manufacturers of safety equipment to develop improved devices or accessories for impact energy or stress relief (such as fall-arrest harnesses accessories to prevent the risk of suspension trauma) during and after a fall incident to further protect worker.

***Intermediate Goal 1e.3 (10PPTRIIG1e.3): Researchers, safety professionals, and safety investigators will use comprehensive digital models of human fall dynamics to evaluate new fall prevention and protection technologies, products, and methods and conduct fall injury investigations to recommend solutions.***

**Activity/Output Goal 1e.3.1 (10PPTRIAOG1e.3.1):** Develop knowledge databases for improving digital human models on fall dynamics, including the phases of fall initiation and fall termination, for use in efficient evaluation of new fall prevention and protection methods and strategies, in fall incident investigations (reconstruction), and in workers' hazard recognition training.

**Activity/Output Goal 1e.3.2 (10PPTRIAOG1e.3.2):** Transfer knowledge databases to digital model developers to develop scientifically comprehensive yet easy-to-use digital modeling modules for use in workplace planning for fall prevention, workers' hazard recognition training, and fall incident investigations.

**Strategic Goal 2 (09PPTRISG2): Reduce occupational injuries and deaths due to motor vehicle incidents and crashes [SPS SG 3, SG 6, SG12; WRT SG 4]**

***Intermediate Goal 2.1 (10PPTRIIG2.1): Industries and companies will incorporate effective interventions into their policies and procedures to reduce motor vehicle related incidents and crashes among professional drivers (i.e., those who drive as a primary job duty such as long- and short-haul truckers, intrastate drivers, day delivery drivers, and taxi drivers). [TWU IG 1.11]***

**Activity/Output Goal 2.1.1 (10PPTRIAOG2.1.1):** Identify risk factors for vehicle crashes among professional truck drivers (i.e., long-haul truckers) [TWU AOG 1.11.1].

**Sub Activity/Output Goal 2.1.1.1(10PPTRISAOG2.1.1.1):** Promote partnerships with other federal agencies during all phases of research related to professional truck drivers to ensure effective translation of research results.

**Activity/Output Goal 2.1.2 (10PPTRIAOG2.1.2):** Identify risk factors for vehicle crashes among professional drivers other than long-haul truckers (e.g., short-haul truckers, intrastate drivers, day delivery drivers, taxi drivers) and prioritize these subpopulations of drivers for targeted research efforts. [WRT AOG 4.2.2 through 4.2.6]

**Sub Activity/Output Goal 2.1.2.1(10PPTRISAOG2.1.2.1):** Promote efforts and research proposals addressing vehicle crashes among subpopulations of professional drivers (other than long-haul truckers) that were identified as highest priority [TWU IG 1.29; TWU AG 1.29.1 through 1.29.3; AFF IG 4.5; SRV SG 1].

**Sub Activity/Output Goal 2.1.2.2 (10PPTRISAOG2.1.2.2):** Promote NORA activities, both intramural and extramural, that focus attention on subpopulations of professional drivers (other than long-haul truckers), particularly subpopulations that were identified as highest priority.

**Activity/Output Goal 2.1.3 (10PPTRIAOG2.1.3):** Evaluate intervention strategies for their effectiveness in reducing work-related motor vehicle incidents and crashes. [WRT AOG 4.3.2]

***Intermediate Goal 2.2 (10PPTRIIG2.2): The road construction industry will incorporate effective interventions into their policies and procedures to reduce injuries and deaths due to vehicle and equipment related struck-by incidents [CON SG 3.0].***

**Activity/Output Goal 2.2.1 (10PPTRIAOG2.2.1):** Evaluate strategies to reduce ground worker exposures to road construction vehicles and equipment [CON IG 3.3].

**Sub Activity/Output Goal 2.2.1.1 (10PPTRISAOG2.2.1.1):** Evaluate existing engineering control strategies (internal traffic control plans and off-the-shelf proximity warning systems) [CON RG 3.3.1].

**Activity/Output Goal 2.2.2 (10PPTRIAOG2.2.2):** Promote the availability and use of operator visibility information for construction vehicles and equipment [CON IG 3.4].

**Sub Activity/Output Goal 2.2.2.1 (10PPTRISAOG2.2.2.1):** Make available blind area diagrams for selected construction vehicles and equipment used in the road construction industry [CON r2pG 3.4.1].

**Sub Activity/Output Goal 2.2.2.2 (10PPTRISAOG2.2.2.2):**  
Disseminate and promote the use of blind area diagrams for training equipment operators and ground workers who work around operating construction vehicles and equipment [CON r2pG 3.4.2].

**Activity/Output Goal 2.2.3(10PPTRIAOG2.2.3):** Evaluate worker injury risks associated with the expanded use of night work in the road construction industry [CON IG 3.5].

**Sub Activity/Output Goal 2.2.3.1 (10PPTRISAOG2.2.3.1):**  
Survey the industry on night work-related injuries [CON RG 3.5.1].

**Sub Activity/Output Goal 2.2.3.2 (10PPTRISAOG2.2.3.2):**  
Convene a workshop addressing night work in road construction to improve the understanding of injury patterns and risk factors [CON RG 3.5.2].

**Activity/Output Goal 2.2.4 (10PPTRIAOG2.2.4):** Gain widespread usage of effective prevention measures in the road construction industry [CON IG 3.6].

**Sub Activity/Output Goal 2.2.4.1 (10PPTRISAOG2.2.4.1):**  
Partner with road construction industry stakeholders and other federal agencies to widely disseminate effective practices for reducing injuries associated with vehicle and equipment related struck-by incidents [CON r2pG 3.6.1].

**Sub Activity/Output Goal 2.2.4.2 (10PPTRISAOG2.2.4.2):**  
Develop a strategy to use industry surveys to identify a baseline and a mechanism to track usage of prevention measures over the decade [CON r2pG 3.6.2].

**Activity/Output Goal 2.2.5 (10PPTRIAOG2.2.5):** Investigate, through the Fatality Assessment and Control Evaluation (FACE) Program, vehicle and equipment related deaths associated with road construction work zones.

**Sub Activity/Output Goal 2.2.5.1(10PPTRISAOG2.2.5.1):**  
Identify factors that contribute to vehicle and equipment related fatalities that occur in road construction work zones.

**Sub Activity/Output Goal 2.2.5.2(10PPTRISAOG2.2.5.2):**  
Develop and disseminate comprehensive recommendations for preventing similar deaths in road construction work zones.

***Intermediate Goal 2.3 (10PPTRIIG2.3): Industry will incorporate effective interventions into their policies and procedures to reduce motor vehicle related incidents and crashes among public safety and emergency response workers.***

**Activity/Output Goal 2.3.1 (10PPTRIAOG2.3.1):** Evaluate strategies to reduce incidents of vehicle related injuries and deaths among firefighters [SPS SG 3].

**Sub Activity/Output Goal 2.3.1.1 (10PPTRISAOG2.3.1.1):**  
Evaluate seatbelt use in fire service vehicles [SPS IG 3.1].

**Sub Activity/Output Goal 2.3.1.2 (10PPTRISAOG2.3.1.2):**  
Evaluate the effectiveness of policies and practices to reduce fatalities related to high-speed response and unsafe driving among fire service personnel [SPS IG 3.2].

**Activity/Output Goal 2.3.2 (10PPTRIAOG2.3.2):** Evaluate strategies to reduce incidents of vehicle related injuries and deaths among law enforcement personnel [SPS SG 6].

**Sub Activity/Output Goal 2.3.2.1 (10PPTRISAOG2.3.2.1):**  
Evaluate seatbelt use in law enforcement vehicles [SPS IG 6.1].

**Activity/Output Goal 2.3.3 (10PPTRIAOG2.3.3):** Evaluate strategies to reduce incidents of vehicle related injuries and deaths among emergency medical services (EMS) personnel [SPS Strategic Goal SG 12].

**Sub Activity/Output Goal 2.3.3.1 (10PPTRISAOG2.3.3.1):**  
Create and promulgate training programs to ensure safe operation of all ground vehicles through management and labor organization partnerships [SPS IG 12.1].

**Sub Activity/Output Goal 2.3.3.2 (10PPTRISAOG2.3.3.2):**  
Develop partnerships with vehicle and equipment manufacturers, EMS agencies, and other stakeholders and partners to improve the designs of all vehicle types used by EMS to decrease the risks of injuries and fatalities that result from vehicle crashes [SPS IG 12.2].

**Activity/Output Goal 2.3.4 (10PPTRIAOG2.3.4):** Investigate, through the Fire Fighter Fatality Investigation and Prevention Program (FFFIPP), vehicle related deaths among fire service and EMS personnel.

**Sub Activity/Output Goal 2.3.4.1 (10PPTRISAOG2.3.4.1):** Identify factors that contribute to vehicle related fatalities that occur among fire service and EMS personnel.

**Sub Activity/Output Goal 2.3.4.2 (10PPTRISAOG2.3.4.2):** Develop and disseminate comprehensive recommendations for preventing similar deaths among fire service and EMS personnel.

**Intermediate Goal 2.4(10PPTRIIG2.4):** *Global partners will collaborate to develop strategies for reducing occupational road traffic injuries worldwide* [GLC SG 3].

**Activity/Output Goal 2.4.1(10PPTRIAOG2.4.1):** Partner with the World Health Organization to include and promote occupational aspects of road safety in the WHO Global Road Safety Initiative [GLC IG 3.1].

**Sub Activity/Output Goal 2.4.1.1 (10PPTRISAOG2.4.1.1):** Develop an online library of international good practices for workers driving or walking on roads [GLC AOG 3.1.1].

**Sub Activity/Output Goal 2.4.1.2(10PPTRISAOG2.4.1.2):** Hold an international conference to solidify national and international partnerships and initiate actions to implement and evaluate practices in at least three countries [GLC AOG 3.1.2].

**Sub Activity/Output Goal 2.4.1.3(10PPTRISAOG2.4.1.3):** Publish a NIOSH/WHO document that describes international good practices for workers driving or walking on roads [GLC AOG 3.1.3].

**Activity/Output Goal 2.4.2 (10PPTRIAOG2.4.2):** Provide technical assistance to global partners developing international road safety initiative outputs to protect workers driving or walking on roads [GLC IG 3.2].

**Sub Activity/Output Goal 2.4.2.1 (10PPTRISAOG2.4.2.1):** Assist the UN Road Safety Collaboration and other global organizations [GLC AOG 3.2.1].

**Strategic Goal 3(09PPTRISG3): Reduce occupational injuries and deaths due to workplace violence**

**Strategic Subgoal 3a (10PPTRISG3a): Reduce occupational injuries and deaths due to workplace violence among taxicab drivers** [TWU IG 1.19]

***Intermediate Goal 3a.1 (10PPTRIIG3a.1): Industry will implement effective safety equipment in their taxicabs and transportation regulators will incorporate effective safety equipment into their ordinances to prevent injuries to taxi drivers resulting from physical violence.***

**Activity/Output Goal 3a.1.1 (10PPTRIAOG3a.1.1):** Develop partnerships with trade associations, police departments, taxicab companies, and community regulators for the development of and support to NIOSH research protocols for evaluation of safety equipment in taxicabs to prevent robberies, assaults and homicides.

**Activity/Output Goal 3a.1.2 (10PPTRIAOG3a.1.2):** Conduct research to identify risk factors for injuries to taxi drivers resulting from physical violence. [TWU AG 1.19.1]

**Activity/Output Goal 3a.1.3 (10PPTRIAOG3a.1.3):** Conduct research studies to demonstrate the effectiveness of safety equipment in taxicabs such as partitions, cameras, GPS and emergency alert systems, and cashless systems, and training programs to reduce robberies, assaults and homicides of taxicab drivers. [TWU AG 1.19.2]

**Activity/Output Goal 3.a.1.4 (10PPTRIAOG3a.1.4):** Conduct research studies to demonstrate the effectiveness of model programs to increase adoption by the industry, transportation regulators, and drivers and their associations of effective safety equipment in cabs to reduce violence risk. Evaluate effectiveness of partnerships with regulators and industry to implement programs.

**Activity/Output Goal 3a.1.5 (10PPTRIAOG3a.1.5):** Develop partnerships with community transportation regulators, police departments and their associations, and taxicab associations to implement a model program in at least 1 community to increase the number of taxicabs compliant with effective interventions. [TWU AG 1.19.3]

**Activity/Output Goal 3a.1.6 (10PPTRIAOG3a.1.6):** Collaborate with industry, municipal and state transportation regulators, taxicab safety equipment manufacturers, and regulatory agencies to promote implementation of effective safety equipment nationwide to prevent injuries to taxi drivers resulting from physical violence. [TWU AG 1.19.3]

**Strategic Subgoal 3b (10PPTRISG3b): Reduce workplace violence among high risk retail trade workers including grocery stores, gasoline stations, convenience stores, bakeries, liquor stores, and other shops and businesses at risk of robbery. [WRT SG 3]**

***Intermediate Goal 3b.1 (10PPTRIIG3b.1): Retail businesses will implement NIOSH recommendations for effective security equipment, cash handling procedures, environmental designs, and employee training for behavior in a robbery event for prevention of robberies in their workplace and robbery-related injury in their workplace.***

**Activity/Output Goal 3b.1.1 (10PPTRIAOG3b.1.1):** Conduct research to evaluate successful models for diffusion of NIOSH and OSHA guidelines for prevention of robbery and robbery-related assaults and homicides to retail businesses. Different models will include evaluation of problem-oriented community policing model, health communication models, legislative models, and business self-certification programs. Research will be conducted to evaluate different approaches and partnerships using these diffusion models for increasing participation in training and education programs and compliance to recommendations.

**Activity/Output Goal 3b.1.2 (10PPTRIAOG3b.1.2):** Improve transfer, diffusion, and adoption of effective workplace violence interventions using proven diffusion models in high robbery-risk retail trade sector businesses. [WRT IG 3.3]

**Sub-Activity/Output Goal 3b.1.2.1 (10PPTRISAOG3b.1.2.1):** Utilize partnerships with employers, labor unions, trade associations, police departments and their associations, and federal agencies to increase the knowledge of workplace violence risks and potential strategies and interventions that limit risks in high risk wholesale and retail trade businesses.

**Sub-Activity/Output Goal 3b.1.2.2 (10PPTRISAOG3b.1.2.2):** Develop and implement communication plans for effective workplace violence intervention strategies that are demonstrated to have reached target audiences in the wholesale and retail trade sector.

**Sub-Activity/Output Goal 3b.1.2.3 (10PPTRISAOG3b.1.2.3):** Utilize and evaluate partnerships with employers, trade associations, government agencies, police departments and their associations, and crime prevention organizations to increase knowledge among police departments and implement a successful community policing program which increases business compliance to interventions and reduces robbery-related assaults in 3 communities.

**Activity/Output Goal 3b.1.3 (10PPTRIAOG3b.1.3):** Use reliable economic models to accurately assess the costs of fatal and non-fatal

injuries and illnesses from workplace violence and the potential savings from reducing incidence and severity of workplace violence events.

**Sub-Activity/Output Goal 3b.1.3.1 (10PPTRISAOG3b.1.3.1):**

Complete an assessment of reduction in costs due to implementation of a successful community policing program in one community.

**Sub-Activity/Output Goal 3b.1.3.2 (10PPTRISAOG3b.1.3.2):**

Disseminate return on investment and cost data to community partners to promote compliance to NIOSH and OSHA guidelines for retail workplace violence prevention.

**Strategic Subgoal 3c (10PPTRISG3c): Identify risk factors and effective interventions to prevent workplace violence among high risk services, health care, social service, and public safety sector workers**

such as eating and drinking establishment workers including pizza delivery services; hotels/motel workers; automotive repair mechanics; teachers and other high risk school workers; nurses and nursing assistants in general medical, home health care, nursing homes, and psychiatric hospitals; social service workers in job training, residential care, and day care industries; private security workers; and public safety and correctional workers in emergency response tasks (e.g., medical services and police calls and correctional officer activities). [SPS SG 7; IG 9.1; SRV SG 11]

***Intermediate Goal 3c.1 (10PPTRIIG3c.1): Industry will implement NIOSH recommendations for effective interventions to reduce workplace violence to high risk services, health care, and social service sector workers.***

**Activity/Output Goal 3c.1.1 (10PPTRIAOG3c.1.1):** Develop partnerships with industry, unions, and federal agencies in the development of and support to NIOSH protocols for research into workplace violence risk factors and evaluation of interventions in high risk services, health care, social service, and public safety sector workers.

**Activity/Output Goal 3c.1.2 (10PPTRIAOG3c.1.2):** Conduct studies to identify risk factors associated with physical trauma and verbal abuse (such as bullying, harassment and intimidation) from workplace violence among high risk services, health care, social service, and public safety sector workers. [SPS RG 7,1,2; RG 9.1.2]

**Activity/Output Goal 3c.1.3 (10PPTRIAOG3c.1.3):** Identify, develop, and evaluate effective interventions that reduce violence among high risk populations of workers in the high risk services, health care, social service, and public safety sectors. [SPS RG 7.1.4; RG 9.1.5; SRV IG 11.1, RG 11.1.2]

**Activity/Output Goal 3c.1.4 (10PPTRIAOG3c.1.4):** Improve transfer, diffusion, and adoption of effective workplace violence interventions in high risk services, health care, social service, and public safety sector workers. [SPS IG 7.2, TG 9.1.7, IG 9.2; SRV DG 11.1.3]

**Sub-Activity/Output Goal 3c.1.4.1 (10PPTRISAOG3c.1.4.1):** Utilize partnerships with employers, labor unions, trade associations and government agencies in the service sector to increase the knowledge of workplace violence risks and potential strategies to limit risks, and evaluate the effectiveness of these partnerships.

**Sub-Activity/Output Goal 3c.1.4.2 (10PPTRISAOG3c.1.4.2):** Develop and implement communication plans for effective workplace violence intervention strategies that are demonstrated to have reached target audiences in the range of small to large employers. [SPS TG 7.1.5, TG 7.1.3]

**Activity/Output Goal 3c.1.5 (10PPTRIAOG3c.1.5):** Use reliable economic models to accurately assess the costs of fatal and non-fatal injuries and illnesses from workplace violence and the potential savings from reducing incidence and severity of workplace violence events among service and public safety sector workers.

**Sub-Activity/Output Goal 3c.1.5.1 (10PPTRISAOG3c.1.5.1):** Disseminate return on investment and cost data to community partners to promote compliance to NIOSH and OSHA guidelines for workplace violence prevention in high risk service and public safety sectors.

## **Strategic Goal 4(09PPTRISG4): Reduce Occupational Injuries and Deaths due to Machines and Industrial Vehicles**

**Strategic Subgoal 4a (10PPTRISG4a): : Reduce occupational injuries and deaths in industries at high risk for mobile machine and industrial vehicle overturns. [AFF IG 4.1]**

*Intermediate Goal 4a.1 (10PPTRIIG4a.1): Government agencies, equipment manufacturers, and farming groups will work together in a prevention-through-design effort to increase the use of ROPS on tractors to an effective level in the agricultural production industry and other high risk industries. [AFF IG 4.1]*

**Activity/Output Goal 4a.1.1 (10PPTRIAOG4a.1.1):** Provide data to manufacturers on the effectiveness of cost-effective rollover protective structures (CROPS) for existing ROPS retrofit programs (e.g. state programs).

**Activity/Output Goal 4a.1.2 (10PPTRIAOG4a.1.2):** Partner with manufacturers to provide cost-effective rollover protective structures (CROPS) for existing ROPS retrofit programs (e.g. state programs).

**Activity/Output Goal 4a.1.3 (10PPTRIAOG4a.1.3):** Partner with the NIOSH Agricultural Health Centers, equipment manufacturers, and other stakeholders to increase the percentage of farm tractors in the US equipped with ROPS to an effective level.

**Activity/Output Goal 4a.1.4 (10PPTRIAOG4a.1.4):** Partner with the USDA, National Agricultural Statistics Service (NASS) to continue monitoring the prevalence of ROPS-equipped tractors used on agricultural production establishments in the US.

***Intermediate Goal 4a.2 (10PPTRIIG4a.2): Government agencies, equipment manufacturers, and industry groups will work together in a prevention-through-design effort to increase the use of new ROPS technologies on mobile machines at high risk for overturns.***

**Activity/Output Goal 4a.2.1 (10PPTRIAOG4a.2.1):** Work with volunteer standards organizations to finalize the adoption of an AutoROPS standard for use on zero-turn mowers and similar mobile machines.

**Activity/Output Goal 4a.2.2 (10PPTRIAOG4a.2.2):** Partner with zero-turn mower manufacturers to transfer AutoROPS technology to the industry.

**Strategic Subgoal 4b (10PPTRISG4b): Reduce occupational injuries and deaths in industries at high risk for mobile machine and industrial vehicle non-overturn events. [AFF IG 4.2]**

***Intermediate Goal 4b.1 (10PPTRIIG4b.1): Government agencies, equipment manufacturers, and industry groups will work together in a prevention-through-design effort to decrease pedestrians being struck by mobile machinery and industrial vehicles. [AFF IG 4.2; CON IG 3.3; TWU IG 1.25]]***

**Activity/Output Goal 4b.1.1 (10PPTRIAOG4b.1.1):** Work with industry partners and other federal agencies to develop controls to reduce fatal injuries due to forklifts. [TWU AG 1.25.2]

**Activity/Output Goal 4b.1.2 (10PPTRIAOG4b.1.2):** Work with mining industry partners to develop interventions for preventing injuries related to machine safety and powered haulage equipment. [MIN IG 4.2]

**Activity/Output Goal 4b.1.3 (10PPTRIAOG4b.1.3):** Partner with the NIOSH Agricultural Health Centers, equipment manufacturers, and other stakeholders to decrease the deaths and injuries to pedestrians struck by farm tractors and other agricultural machines. [AG IG 4.2]

**Activity/Output Goal 4b.1.4 (10PPTRIAOG4b.1.4):** Disseminate to the commercial logging industry proven or promising prevention strategies to address key injury risk factors.

***Intermediate Goal 4b.2 (10PPTRIIG4b.2): Government agencies, equipment manufacturers, and industry groups will work together in a prevention-through-design effort to decrease other injury events caused by mobile machinery and industrial vehicles.*** [AFF IG 4.3; SRV IG 15.4]

**Activity/Output Goal 4b.2.1 (10PPTRIAOG4b.2.1):** Validate a computer simulation model to analyze the impact of dynamic loading of scissor-lifts for evaluating fall, collapse and tip-over incidents for use in improving equipment design and developing effective safety devices for adoption by equipment manufacturers.

**Strategic Subgoal 4c (10PPTRISG4c): Reduce occupational injuries and deaths in industries at high risk for stationary machine entanglements.** [AFF IG 4.3, IG 4.4]

***Intermediate Goal 4c.1 (10PPTRIIG4c.1): Government agencies, equipment manufacturers, and industry groups will work together to use existing technologies and training programs to prevent machinery entanglements.*** [AFF IG 4.3, IG 4.4]

**Activity/Output Goal 4c.1.1 (10PPTRIAOG4c.1.1):** Work with consensus standards committees and regulatory agencies on the adoption of new ANSI and ISO methods for machine risk reduction.

**Activity/Output Goal 4c.1.2 (10PPTRIAOG4c.1.2):** Work with small businesses to limit entanglement events.

**Activity/Output Goal 4c.1.3 (10PPTRIAOG4c.1.3):** Work with the mining industry to develop interventions, best practices, and strategies for improving miners' training with respect to hazard recognition, risk factor awareness, and emergency response. [MIN IG 4.5]

***Intermediate Goal 4c.2 (10PPTRIIG4c.2): Government agencies, equipment manufacturers, and industry groups will work together in a prevention-through-design effort to evaluate and adopt new technologies to prevent machinery entanglements.***

**Activity/Output Goal 4c.2.1 (10PPTRIAOG4c.2.1):** Partner with the US Coast Guard and the commercial fishing industry to continue development of emergency-stop (e-stop) and other machine safety technologies.

**Activity/Output Goal 4c.2.2 (10PPTRIAOG4c.2.2):** Complete the testing and market development of passively controlling hazardous energy during un-jamming tasks on industrial machines for adoption by manufacturers.

**Activity/Output Goal 4c.2.3 (10PPTRIAOG4c.2.3):** Complete testing and market development of the NIOSH radio frequency (HASARD) device for passively controlling hazardous energy from worker proximity to conveyors and communicate the findings to manufacturers.

**Activity/Output Goal 4c.2.4 (10PPTRIAOG4c.2.4):** Work with manufacturers to investigate wearable sensor technologies for empowering the miner to take proactive steps in decreasing his/her exposure to work-related injuries. [MIN IG 4.3]

**Strategic Subgoal 4d (10PPTRISG4d): Reduce occupational injuries and deaths due to Machines and Industrial Vehicles through the Identification of New Hazards and Risk Factors.**

***Intermediate Goal 4d.1 (10PPTRIIG4d.1): Government agencies, equipment manufacturers, and industry groups will work together to analyze and evaluate surveillance data for deaths and injuries caused machinery and industrial vehicles.*** [AFF IG 4.3]

**Activity/Output Goal 4d.1.1 (10PPTRIAOG4d.1.1):** Characterize and track injuries and fatalities from machinery and industrial vehicles.

**Activity/Output Goal 4d.1.2 (10PPTRIAOG4d.1.2):** Identify and prioritize risk factors associated with machinery and industrial vehicles.

**Activity/Output Goal 4d.1.3 (10PPTRIAOG4d.1.3):** Identify work situations of high risk for machine-related fatal injury and develop prevention strategies for those who can intervene in the workplace by conducting Fatality Assessment and Control Evaluation (FACE) investigations of targeted occupational fatality incidents in industries at high risk for machinery-related deaths.

***Intermediate Goal 4d.2 (10PPTRIIG4d.2): Government agencies, equipment manufacturers, and industry groups will work together to prioritize new research and intervention strategies based on machinery and industrial vehicles surveillance activities.***

**Activity/Output Goal 4d.2.1 (10PPTRIAOG4d.2.1):** Partner with high risk industries to identify and prioritize research and intervention programs for risk factors found to be associated with machinery and industrial vehicles.

**Activity/Output Goal 4d.2.2 (10PPTRIAOG4d.2.2):** Partner with regulatory agencies to identify and prioritize the development of new standards and employer programs based on machinery and industrial vehicles risk factors.

**Strategic Goal 5(09PPTRISG5):Reduce occupational injuries and deaths among high risk and vulnerable worker groups (i.e., young workers, older workers, Hispanic workers, foreign-born workers, immigrant workers, workers with physical disabilities, day workers, and groups with injury rates that exceed the average for all workers and/or are increasing over time ).**  
[AFF SG 2; CON SG 12.0; WRT SG 6]

***Intermediate Goal 5.1 (10PPTRIIG5.1) Employers, trade organizations, governmental agencies, safety practitioners, safety advocates, community groups, educators and researchers will use occupational injury data and research to raise awareness of occupational safety problems among vulnerable worker groups (e.g., young workers, older workers, Hispanic workers, foreign-born workers), and to guide prevention and research efforts.***

**Activity/Output Goal 5.1.1(10PPTRIAOG5.1.1):** Develop and follow a schedule whereby existing injury surveillance data are analyzed and reported for vulnerable worker groups (e.g., young workers, older workers, Hispanic workers, foreign-born workers). These analyses will address injury burden, patterns, and trends. [AFF IG 2.2; CON IG 12.1]

**Activity/Output Goal 5.1.2 (10PPTRIAOG5.1.2):** Work with federal and state agencies and other external partners to facilitate the use of research findings on vulnerable worker groups in public and private sector intervention efforts. [AFF IG 2.4]

**Activity/Output Goal 5.1.3 (10PPTRIAOG5.1.3):** Target specific vulnerable worker groups (i.e., currently youth < 18 years of age and Hispanic workers, but other groups could be included in the future) for on-site fatality investigations through the Fatality Assessment and Control Evaluation Program (FACE) and collect information on potential contributors to disparate risks, including informal and formal workplace policies and norms, work arrangements, and worker characteristics.

**Activity/Output Goal 5.1.4 (10PPTRIAOG5.1.4):** Meet and communicate regularly with the NIOSH Occupational Health Disparities Program and researchers funded by NIOSH to research vulnerable groups (e.g. state FACE programs, childhood agricultural injury researchers) to share findings and experiences, and identify opportunities for research and prevention collaborations.

**Activity/Output Goal 5.1.5 (10PPTRIAOG5.1.5):** Develop and disseminate occupational safety and health materials that are age, language and culturally appropriate. [AFF IG 2.4; CON IG 12.3]

***Intermediate Goal 5.2 (10PPTRIIG5.2): NIOSH and other research organizations will support risk factor and intervention evaluation research targeted to vulnerable worker groups (e.g. young workers, older workers, immigrant workers, workers with physical disabilities, day workers). [AFF IG 3.2; CON IG 12.2]***

**Activity/Output Goal 5.2.1 (10PPTRIAOG5.2.1):** Work with the NIOSH Occupational Health Disparities Program to explore partnerships to support risk factor research and intervention evaluations targeted at vulnerable worker groups (e.g. young worker, older workers, immigrant workers, workers with physical disabilities, day workers), including community participatory approaches.

**Activity/Output Goal 5.2.2 (10PPTRIAOG5.2.2):** Develop and seek funding for follow-back investigations and focused surveys of vulnerable worker groups (e.g. young workers, older workers, immigrant workers, workers with physical disabilities, day workers), in order to supplement existing surveillance data. [CON IG 12.1]

**Activity/Output Goal 5.2.3 (10PPTRIAOG5.2.3)** Develop and seek funding for risk factor, intervention and intervention evaluation research for vulnerable worker groups (e.g. young workers, older workers, immigrant workers, workers with physical disabilities, day workers). [CON IG 12.2]

**Activity/Output Goal 5.2.4(10PPTRIAOG5.2.4):** Work with the NIOSH Office of Extramural Programs to support extramural research to assess risk factors, evaluate interventions, and evaluate policies to prevent childhood agricultural injuries as part of the congressionally appropriated childhood agricultural injury prevention initiative and disseminate findings to stakeholders.

**Activity/Output Goal 5.2.5 (10PPTRIAOG5.2.5):** Evaluate risk factors for workplace violence associated with high risk immigrant workers.

**Activity/Output Goal 5.2.6 (10PPTRIAOG5.2.6):** Evaluate the factors associated with fatal and non-fatal workplace violence incidents among youth worker populations in high risk services sector industries.

***Intermediate Goal 5.3(10PPTRIIG5.3): Employers, trade organizations, unions, governmental agencies, standards setting bodies, safety practitioners, safety advocates and researchers will use occupational injury research to raise awareness of occupational safety problems among high-risk worker groups (e.g., groups with injury rates that exceed the average for all workers and/or are increasing over time), and to guide prevention and research efforts. [CON IG 12.3]***

**Activity/Output Goal 5.3.1 (10PPTRIAOG5.3.1):** Work with federal agencies, trade associations, labor unions and other external partners to facilitate the use of research findings on high risk worker groups in public and private sector intervention efforts.

**Activity/Output Goal 5.3.2 (10PPTRIAOG5.3.2):** Conduct fatality investigations of line-of-duty fire fighter injury deaths through the Congressionally appropriated Fire Fighter Fatality Investigation and Prevention Program to identify contributory factors, including those associated with work organization and safety culture, and to develop recommendations for preventing future similar deaths.

***Intermediate Goal 5.4 (10PPTRIIG5.4): NIOSH and other research organizations will support risk factor and intervention evaluation research targeted to high risk worker groups (e.g., groups with injury rates that exceed the average for all workers and/or are increasing over time).***

**Activity/Output Goal 5.4.1 (10PPTRIAOG5.4.1):** Develop and seek funding for follow-back investigations and focused surveys of high risk worker groups (e.g. miners, fire fighters, emergency medical services workers, fishers), in order to supplement existing surveillance data.

**Activity/Output Goal 5.4.2 (10PPTRIAOG5.4.2):** Develop and seek funding for risk factor, intervention and intervention evaluation research for high risk worker groups (e.g. miners, fire fighters, emergency medical services workers, fishers).

**Strategic Goal 6 (10PPTRISG6): Increase the Use of Surveillance Data to Guide Occupational Traumatic Injury Research and Prevention Efforts. [AFF SG 1; CON SG 14.0; SRV SG 17]**

*Intermediate Goal 6.1(10PPTRIIG6.1): Employers, unions, regulatory agencies, safety practitioners and researchers will use occupational injury surveillance data to raise awareness of occupational safety problems and guide prevention and research efforts.*

**Activity/Output Goal 6.1.1(10PPTRIAOG6.1.1):** Partner with other federal agencies to analyze, modify or piggyback on their data collection systems and infrastructure to analyze and collect data on occupational injury deaths, nonfatal injuries, and hazards in a cost-effective manner.

**Activity/Output Goal 6.1.2(10PPTRIAOG6.1.2):** Work with the NIOSH Office of Extramural Programs to support, enhance and expand state-level occupational injury surveillance programs that use existing state-level occupational injury data for state-level prevention, and collect unique state-level data to guide prevention efforts and fill gaps in national occupational injury surveillance systems.

**Activity/Output Goal 6.1.3(10PPTRIAOG6.1.3):** Develop and follow a schedule whereby existing occupational injury surveillance data are analyzed and reported by NORA industry sector and event, to the greatest level of detail as supported by the data. These analyses will address injury burden, patterns, and trends. [AFF SG 1; SRV RG 17.1.3]

**Activity/Output Goal 6.1.4 (10PPTRIAOG6.1.4):** Provide relevant occupational injury surveillance data to OSHA, MSHA and the Wage and Hour Division of the Department of Labor upon request and in direct response to proposed rulemaking.

**Activity/Output Goal 6.1.5 (10PPTRIAOG6.1.5):** Disseminate occupational injury surveillance data and associated prevention recommendations, frequently in collaboration with state agencies and other partners. [AFF IG 1.3]

**Activity/Output Goal 6.1.6(10PPTRIAOG6.1.6):** Increase access to occupational injury surveillance data through the internet. [AFF IG 1.3]

**Activity/Output Goal 6.1.7(10PPTRIAOG6.1.7):** Provide technical assistance on collecting, analyzing and interpreting occupational injury surveillance data.

***Intermediate Goal 6.2(10PPTRIIG6.2): Policy makers, NIOSH, other federal agencies, and/or other statistical and research organizations will support research into the contributors to under-reporting of nonfatal occupational injuries, improvements to existing surveillance systems, and additional systems that provide supplementary data on occupational fatal injuries, nonfatal injuries, hazards and use of control strategies.***

**Activity/Output Goal 6.2.1(10PPTRIAOG6.2.1):** Develop a prioritized list of research questions and promising research approaches to understand under-reporting and improve occupational nonfatal injury surveillance in conjunction with other federal agencies, statistical and research organizations, and academic researchers.

**Activity/Output Goal 6.2.2(10PPTRIAOG6.2.2):** Meet annually with the Bureau of Labor Statistics and OSHA to exchange information, coordinate surveillance activities, identify data gaps (including gaps in denominator data), and develop strategies to address these gaps.

**Activity/Output Goal 6.2.3 (10PPTRIAOG6.2.3):**Work with federal agencies, academicians and other internal and external partners to research innovative approaches to document the experience of worker groups who are not well-captured in the conventional occupational injury surveillance systems (e.g. immigrant workers, workers with disabilities, contract workers, day laborers, volunteers) and seek funding opportunities to further this research.

**Activity/Output Goal 6.2.4 (10PPTRIAOG6.2.4):** Meet annually with at least two other federal agencies to encourage the inclusion in data systems of standardized codes and narrative information on work-relatedness, occupation, industry, and circumstances of injury.

**Activity/Output Goal 6.2.5 (10PPTRIAOG6.2.5):** Work with federal and state agencies and other internal and external partners to explore the addition of economic burden variables to existing and under-development surveillance systems.

**Activity/Output Goal 6.2.6(10PPTRIAOG6.2.6):** Work with federal and state agencies and other internal and external partners to explore the addition of variables on personal protective technology and other control strategies in existing and under-development surveillance systems.

**Activity/Output Goal 6.2.7 (10PPTRIAOG6.2.7):** Develop and seek funding for surveillance research methods projects and projects that address NORA industry sector goals to improve industry sector-specific surveillance.

**Activity/Output Goal 6.2.8 (10PPTRIAOG6.2.8):** Work with the NIOSH Office of Extramural Programs and NORA Sectors to increase occupational safety surveillance research, including evaluations of existing surveillance systems and methods, and the development of new approaches to occupational injury surveillance.