OR-FACE

Oregon Health Authority

OHSU OREGON HEALTH & SCIENCE UNIVERSITY

Preventing Transportation Fatalities: Lessons Learned from Oregon Cases

OTA

Trucking Leadership & Safety Summit

May 2, 2015

Oregon Institute of
Occupational Health Sciences

Agenda

- What is OR-FACE
- Surveillance/Assessment
- Investigation
- Outreach
- SHIFT study
- Proposed projects

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Mission

- Prevent traumatic work-related deaths in Oregon through
  - Surveillance
  - Targeted investigation
  - Assessment
  - Outreach

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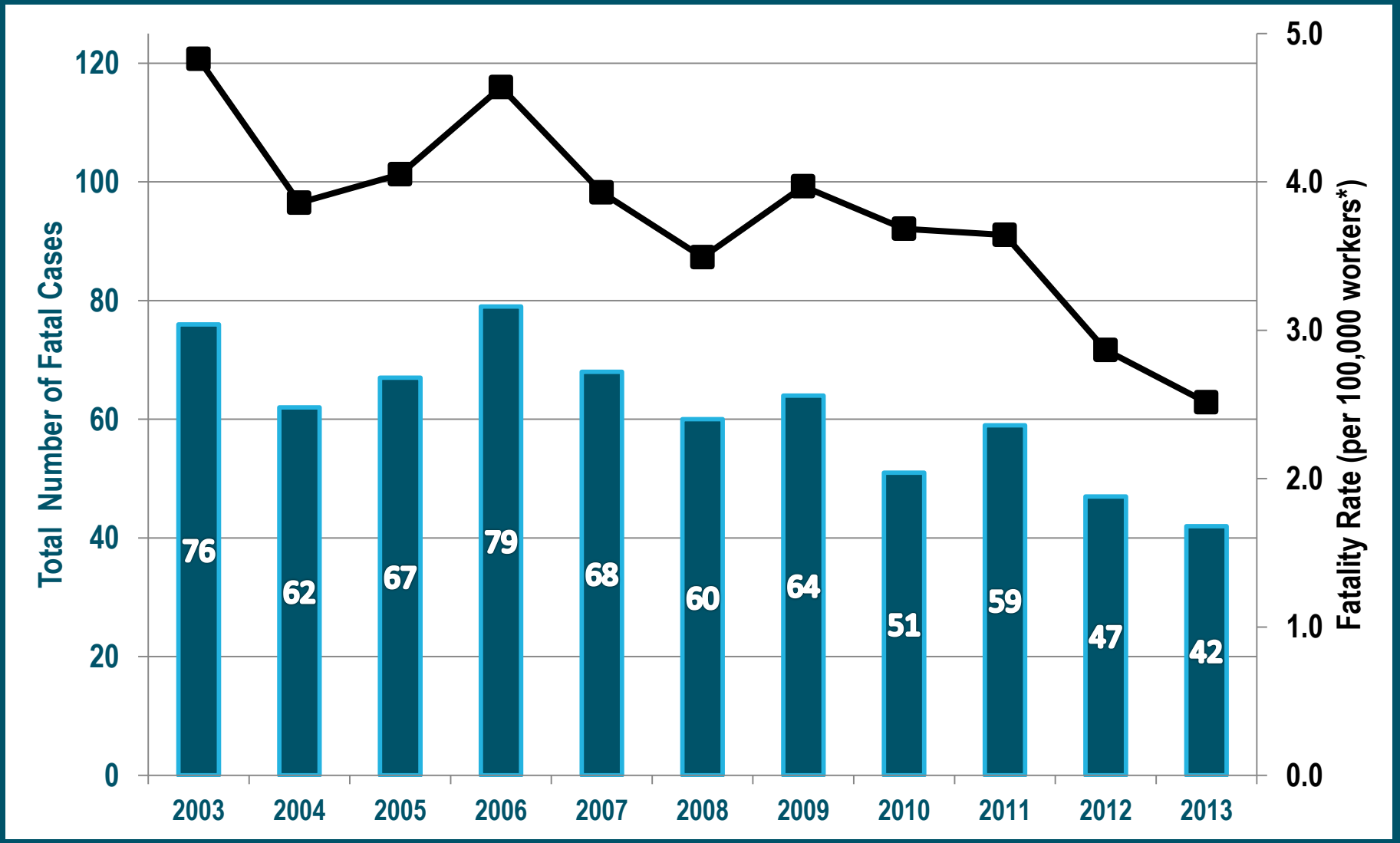
Worker fatalities in Oregon (2003-2013)



Employment data from State of Oregon Employment Department (Total nonfarm employment, annual average not seasonally adjusted)

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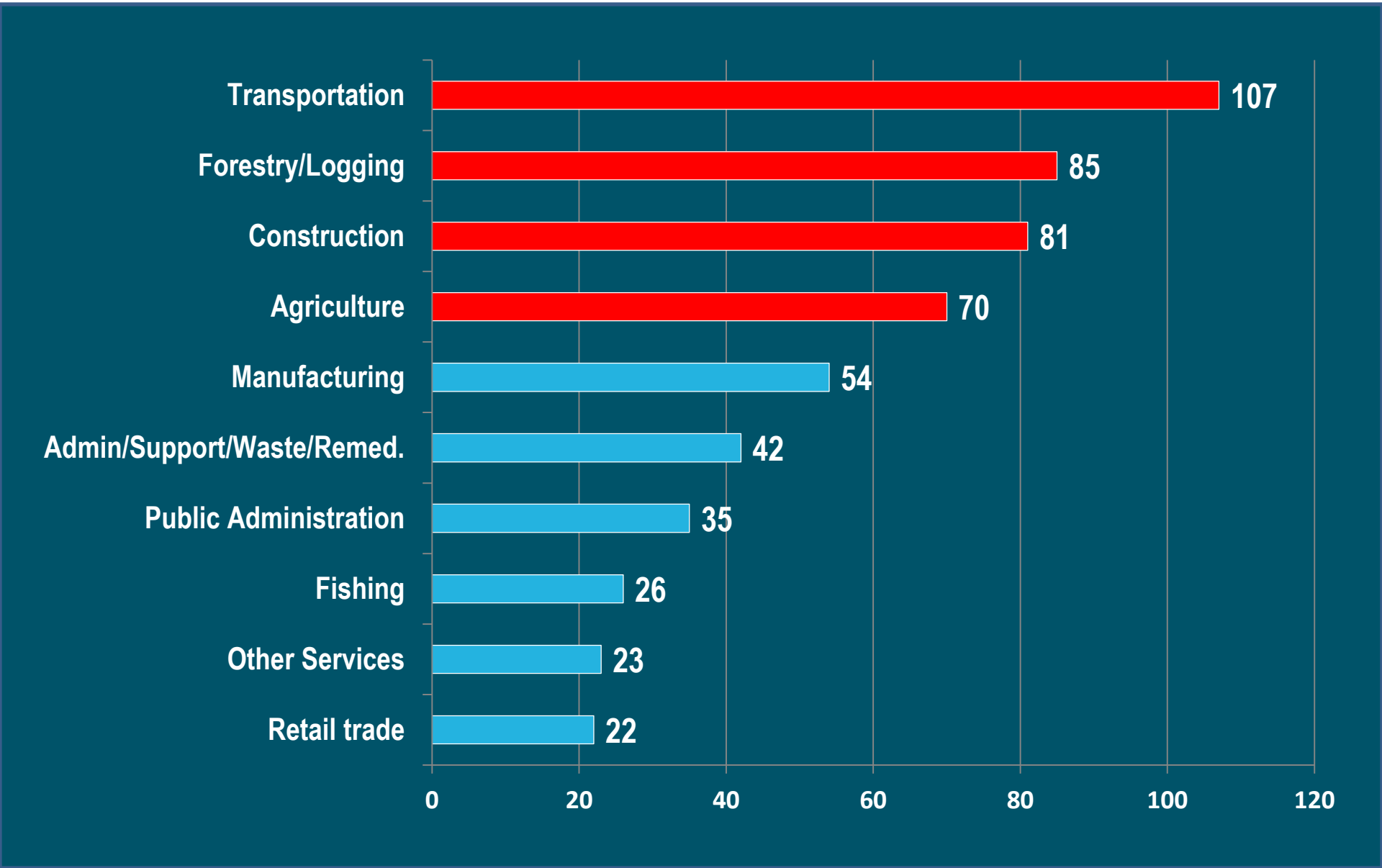
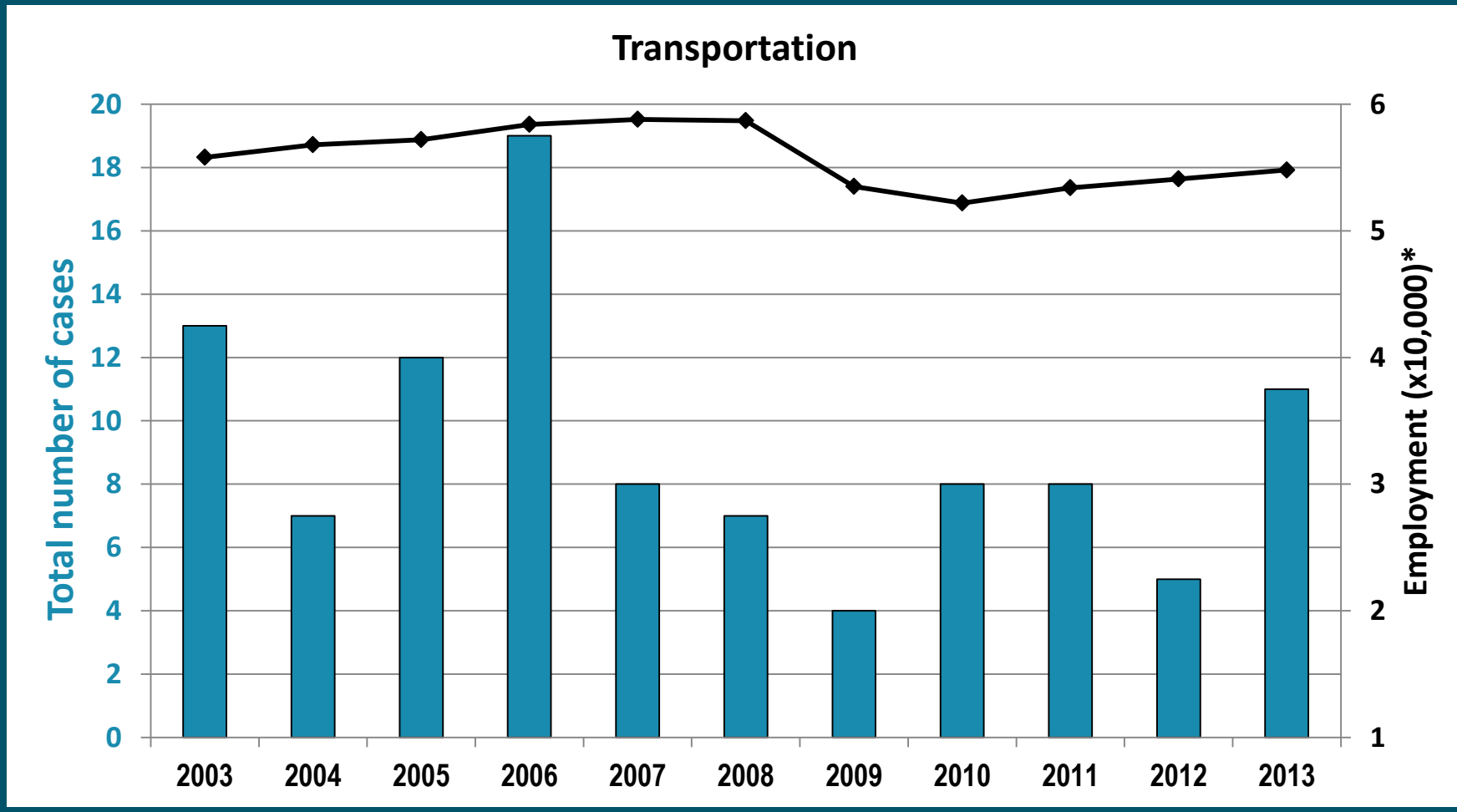
Worker fatalities in Oregon (2003-2013)
Top 10 industries in total number

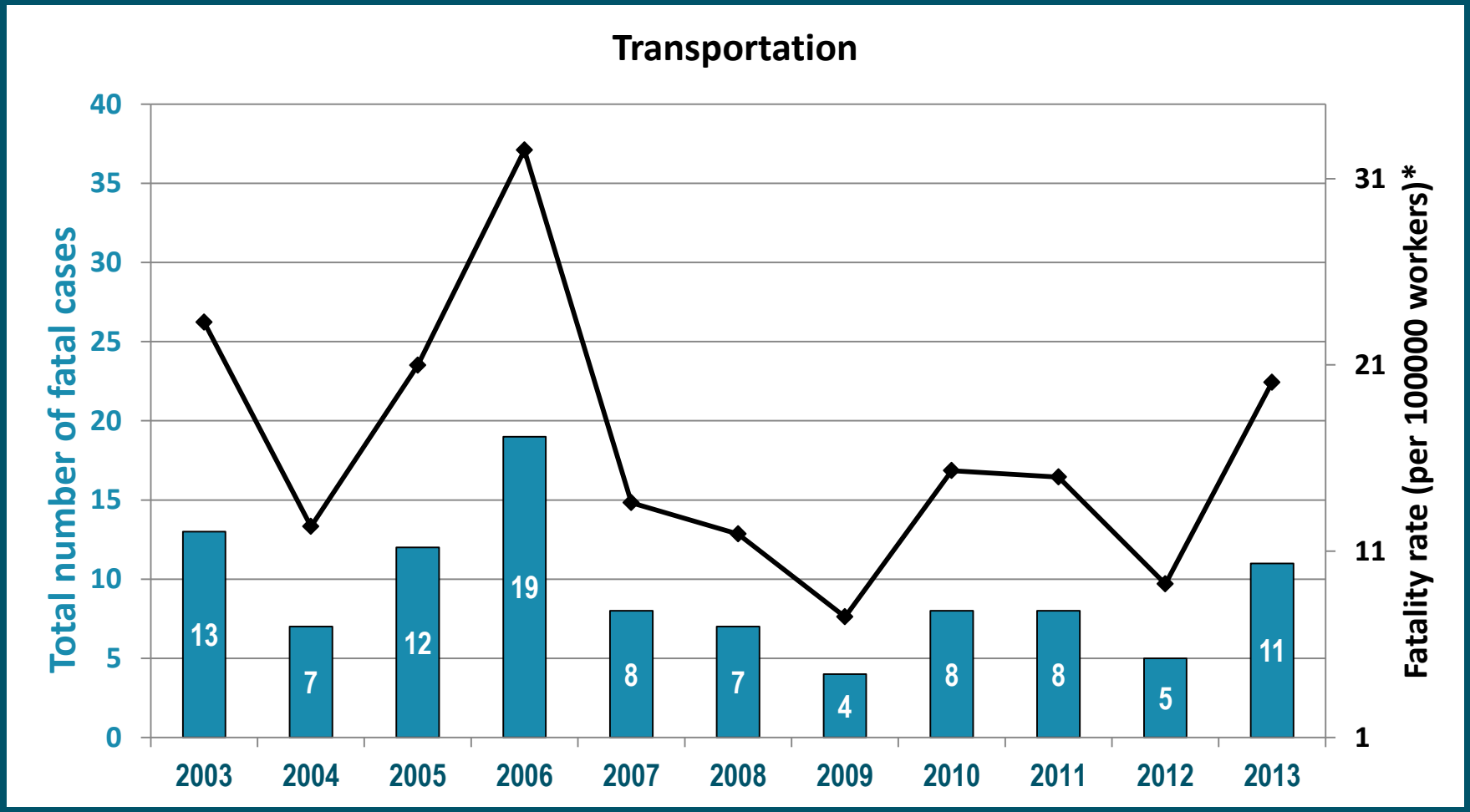


Worker fatalities in Oregon (2003-2013)



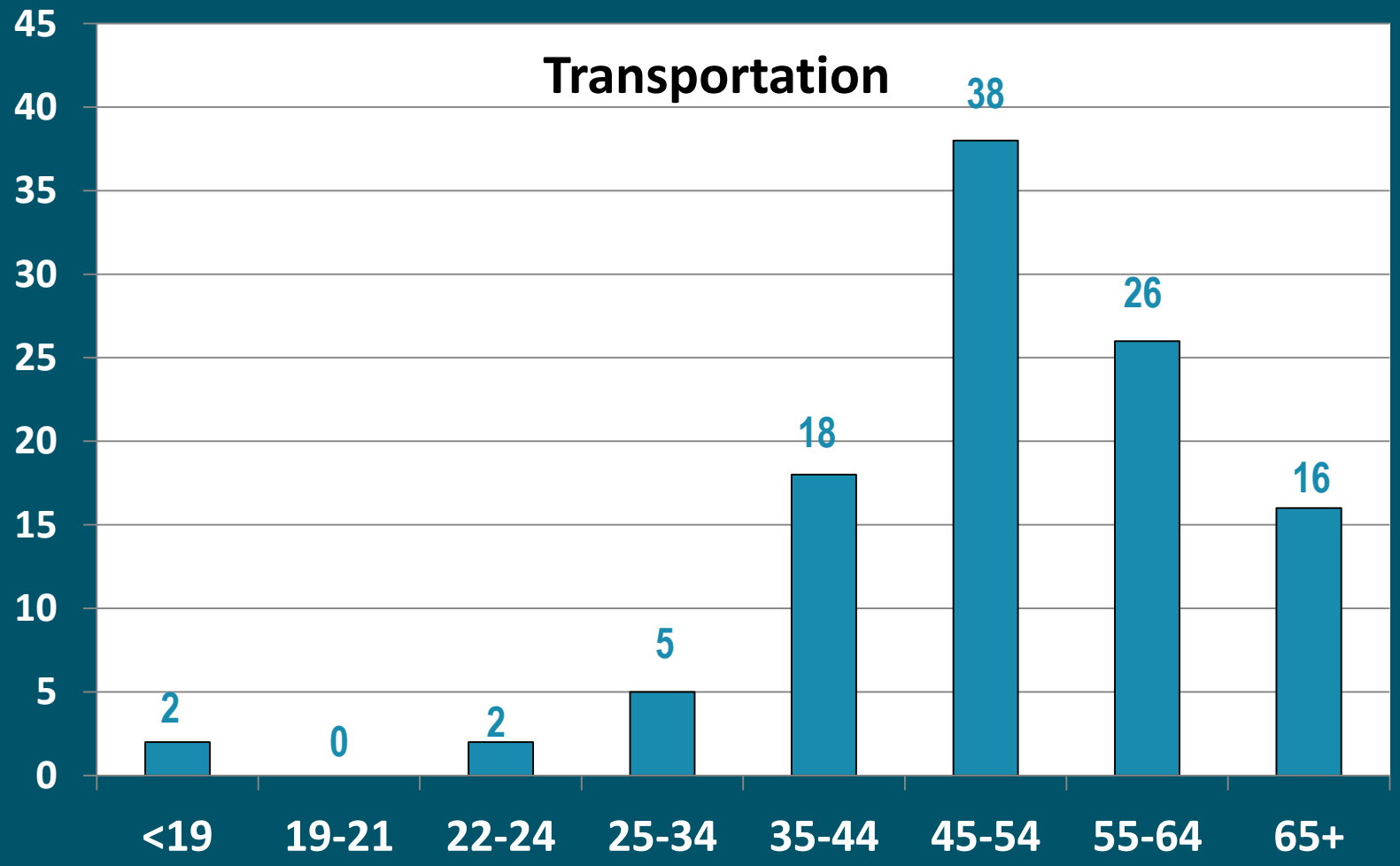
*State of Oregon Employment Department (Total nonfarm employment, annual average not seasonally adjusted)

Worker fatalities in Oregon (2003-2013)

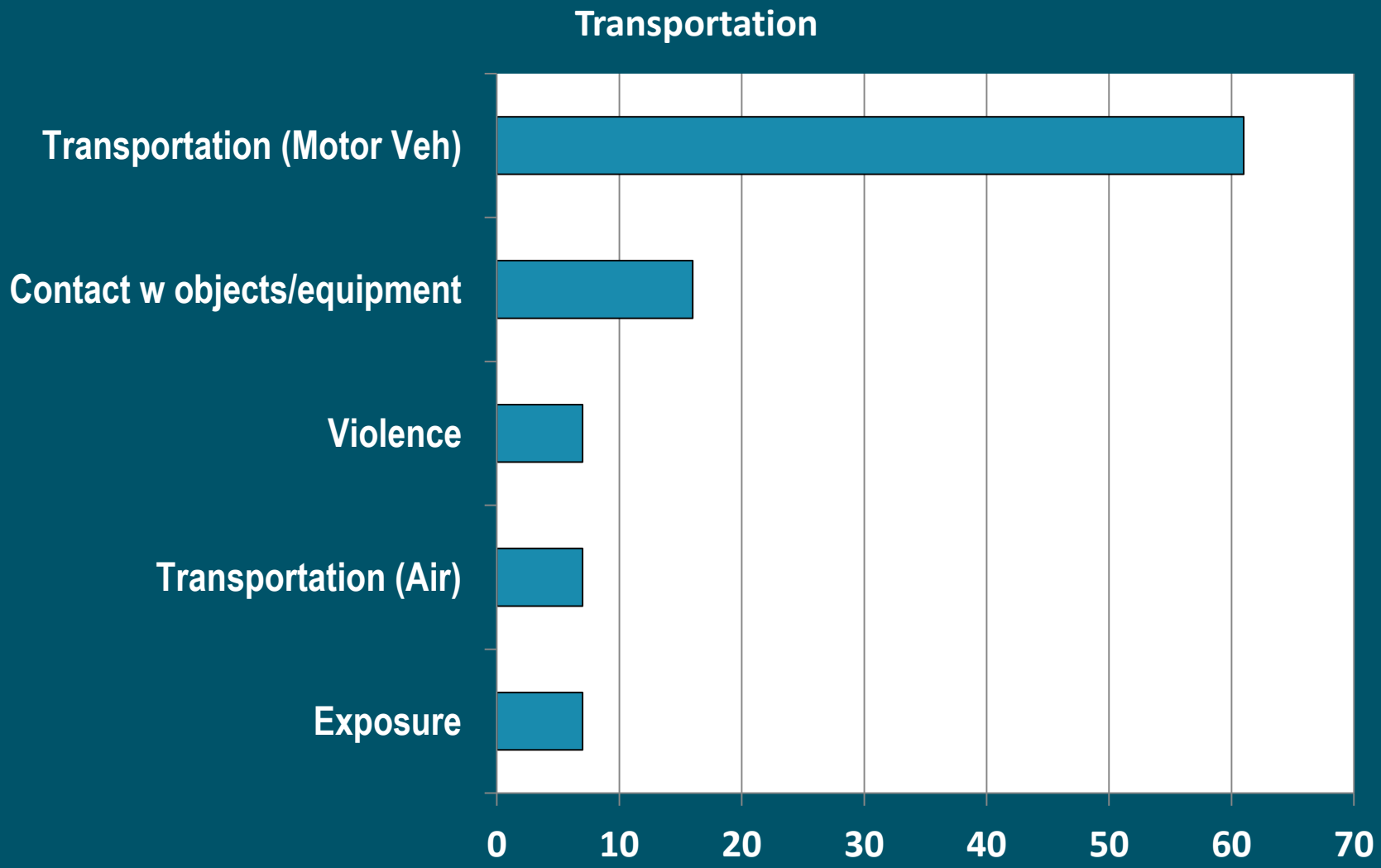


*State of Oregon Employment Department (Total nonfarm employment, annual average not seasonally adjusted)

Worker fatalities in Oregon (2003-2013)
Age Range

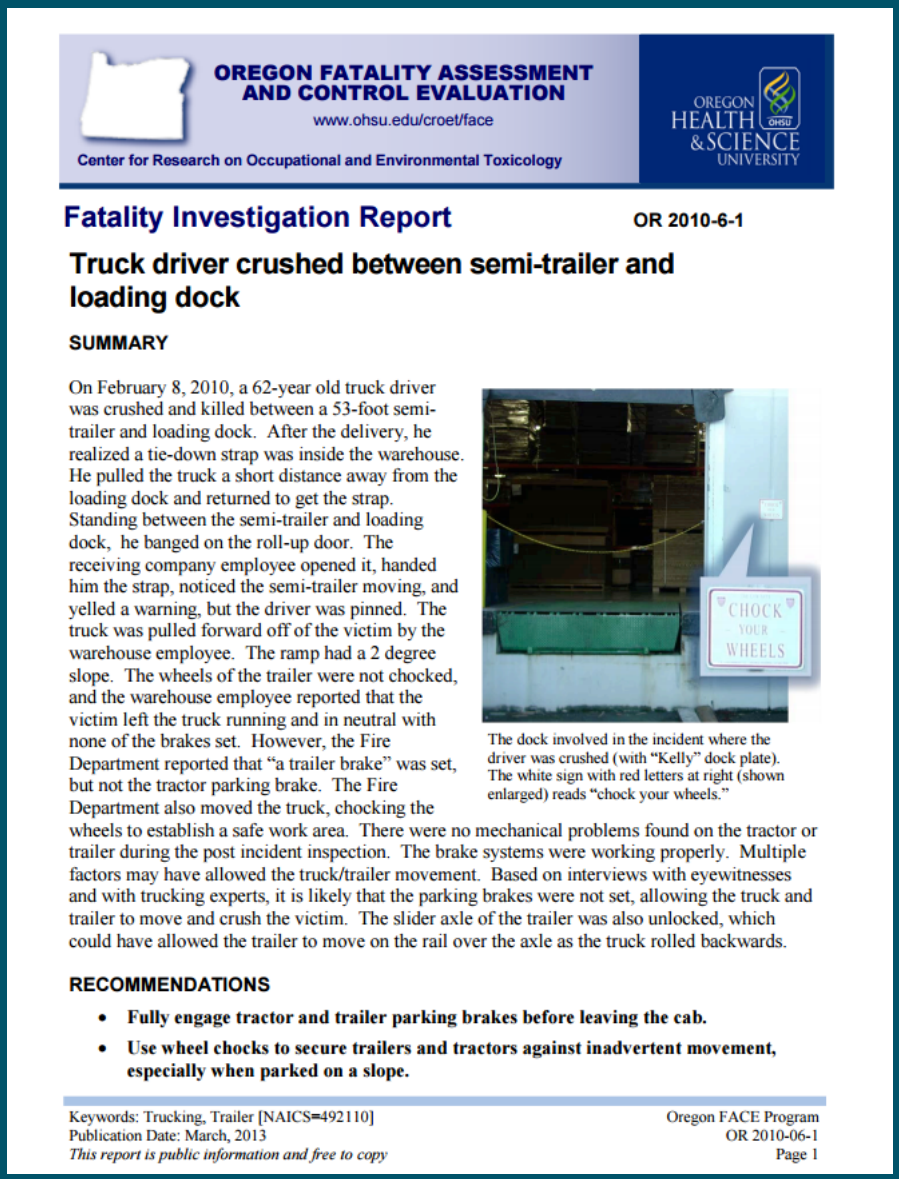


Worker fatalities in Oregon (2003-2013)
Events



CAUSE OF DEATH

Crushing abdominal and pelvic injuries



OREGON FATALITY ASSESSMENT AND CONTROL EVALUATION
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Fatality Investigation Report OR 2010-6-1

Truck driver crushed between semi-trailer and loading dock

SUMMARY

On February 8, 2010, a 62-year old truck driver was crushed and killed between a 53-foot semi-trailer and loading dock. After the delivery, he realized a tie-down strap was inside the warehouse. He pulled the truck a short distance away from the loading dock and returned to get the strap. Standing between the semi-trailer and loading dock, he banged on the roll-up door. The receiving company employee opened it, handed him the strap, noticed the semi-trailer moving, and yelled a warning, but the driver was pinned. The truck was pulled forward off of the victim by the warehouse employee. The ramp had a 2 degree slope. The wheels of the trailer were not chocked, and the warehouse employee reported that the victim left the truck running and in neutral with none of the brakes set. However, the Fire Department reported that "a trailer brake" was set, but not the tractor parking brake. The Fire Department also moved the truck, chocking the wheels to establish a safe work area. There were no mechanical problems found on the tractor or trailer during the post incident inspection. The brake systems were working properly. Multiple factors may have allowed the truck/trailer movement. Based on interviews with eyewitnesses and with trucking experts, it is likely that the parking brakes were not set, allowing the truck and trailer to move and crush the victim. The slider axle of the trailer was also unlocked, which could have allowed the trailer to move on the rail over the axle as the truck rolled backwards.

The dock involved in the incident where the driver was crushed (with "Kelly" dock plate). The white sign with red letters at right (shown enlarged) reads "chock your wheels."

RECOMMENDATIONS

- **Fully engage tractor and trailer parking brakes before leaving the cab.**
- **Use wheel chocks to secure trailers and tractors against inadvertent movement, especially when parked on a slope.**

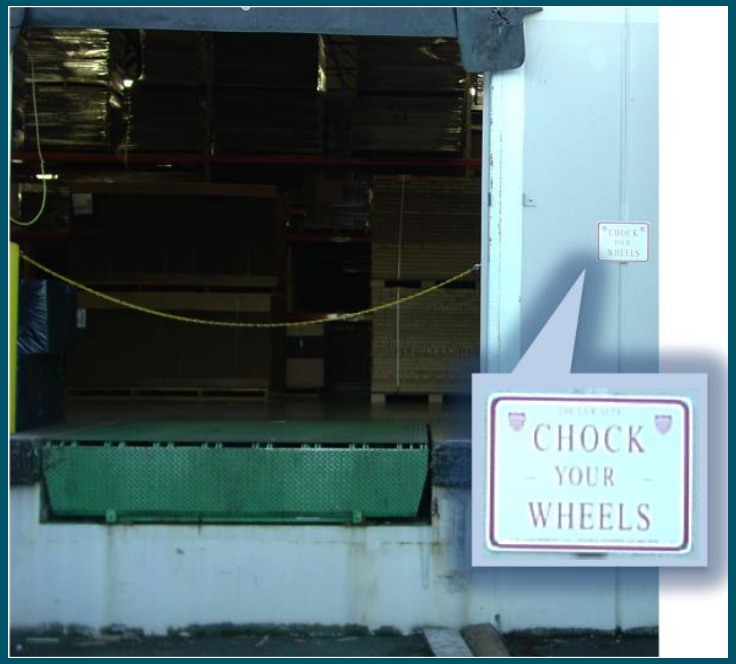
Keywords: Trucking, Trailer [NAICS=492110]
Publication Date: March, 2013
This report is public information and free to copy

Operator

- 62 year-old driver
- Full time driver for 5-6 years with company
- Returned from partial retirement to maintain benefits
- Passed medical exam for CDL
- Stood between trailer and dock knocking on roll-up door

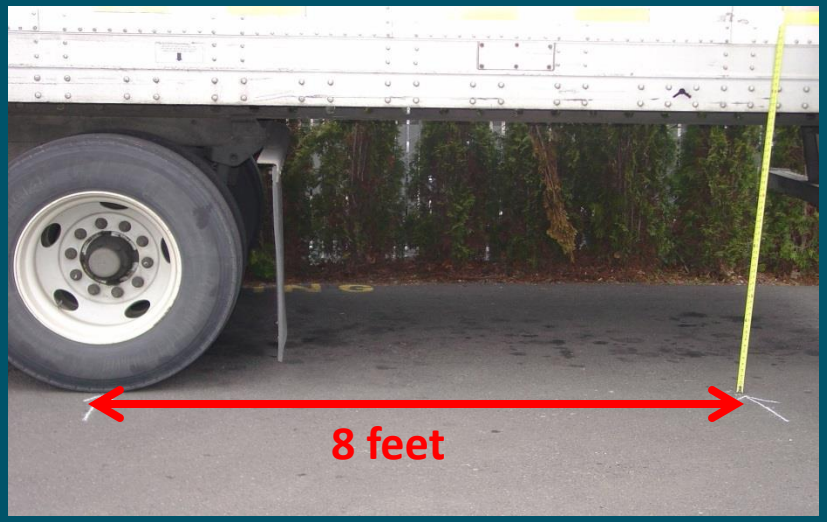
Facts

- **Tractor was rented**
- **Trailer pulled forward 4 feet from dock**
- **Rear-sliding axle was unlocked**
- **Warehouseman saw trailer moving**



FACTS

- Warehouseman saw trailer moving
- Post-incident inspection-no deficiencies
- Truck left running
  - Trolley valve brake set
  - Parking brake NOT set

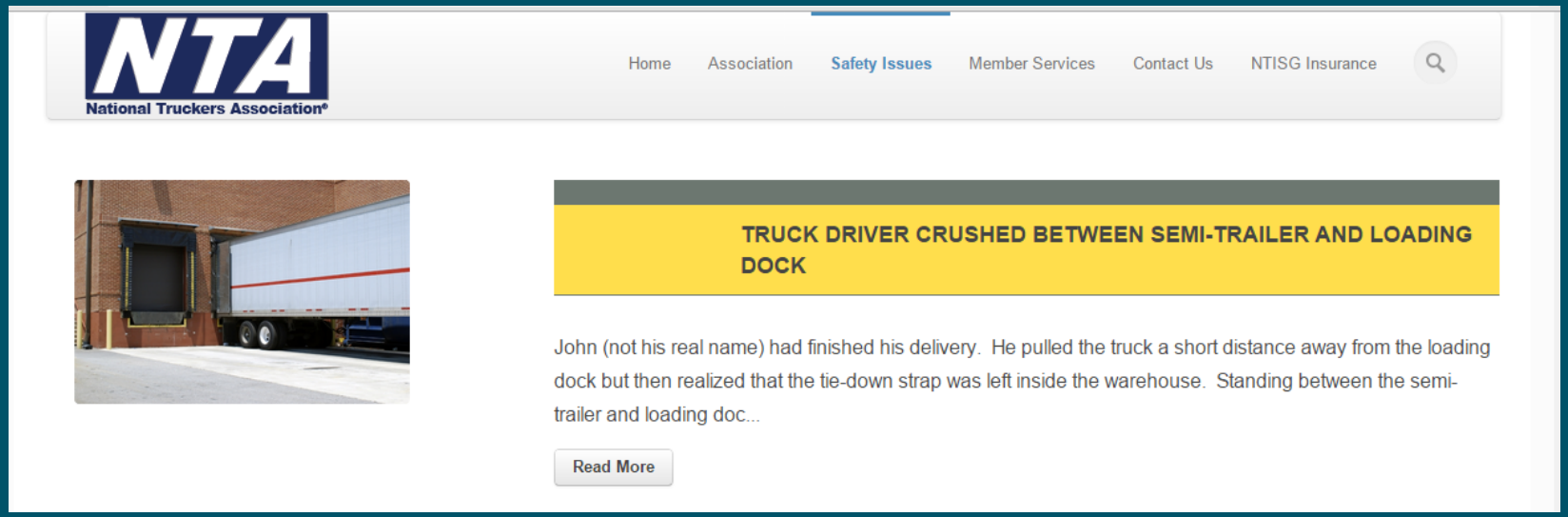


Assumptions

- Driver unfamiliar with rented tractor brakes
- Driver retrieving strap

Recommendations

- Fully engage tractor and trailer parking brakes before leaving cab
- Chock wheels especially if on a slope
- Don’t stand in pinch points
- Train on controls prior to use especially locking mechanisms and brakes
- Monitor safe operating procedures



CAUSE OF DEATH

Crush injuries to chest and head

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Fatality Investigation Report OR 2004-04-01

Parked forklift crushes operator against semi-trailer

SUMMARY

On February 10, 2004, a 42-year-old forklift operator was crushed between the forklift he had been operating and a semi-trailer he was helping to load. Assisting the truck driver to tie down the load, the operator backed the forklift to the opposite side of the trailer, put the automatic transmission into neutral, engaged the parking brake, and jumped out to take the strap thrown across the load by the truck driver. The forklift's engine was left running. While the operator was facing the trailer and busy with the strap, the forklift engaged in reverse and backed into him, crushing him against the trailer with enough force to make the trailer shudder. The truck driver looked under the trailer and saw the victim's legs dangling in the air. He ran to engage the gearshift on the forklift into forward to release the victim. Efforts to revive the victim were unsuccessful, and he was pronounced dead at the scene.

Twin of forklift that backed into and crushed the operator after he jumped out to help load a truck.

CAUSE OF DEATH: Crush injuries to chest and head.

RECOMMENDATIONS

- **Before exiting any powered industrial truck, even briefly, completely shut down power, place controls in neutral and apply parking brake.**
- **Employers should provide ongoing evaluation and feedback for operators of mobile machinery to ensure that operator proficiency and safe work practices are maintained.**
- **Maintain the machine in safe operating condition.**
- **Employees should be encouraged to report concerns related to the safe operation and maintenance of mobile machinery.**

Key Words: Hispanic, Machine Safety

OR FACE Program
OR 2004-04-1
Release Date 09/18/05
Page 1

Operator

- 42 year-old forklift operator
- Worked 8 years for employer
- Hispanic
- Fluent in English
- Experienced forklift operator
- Viewed as leader

Facts

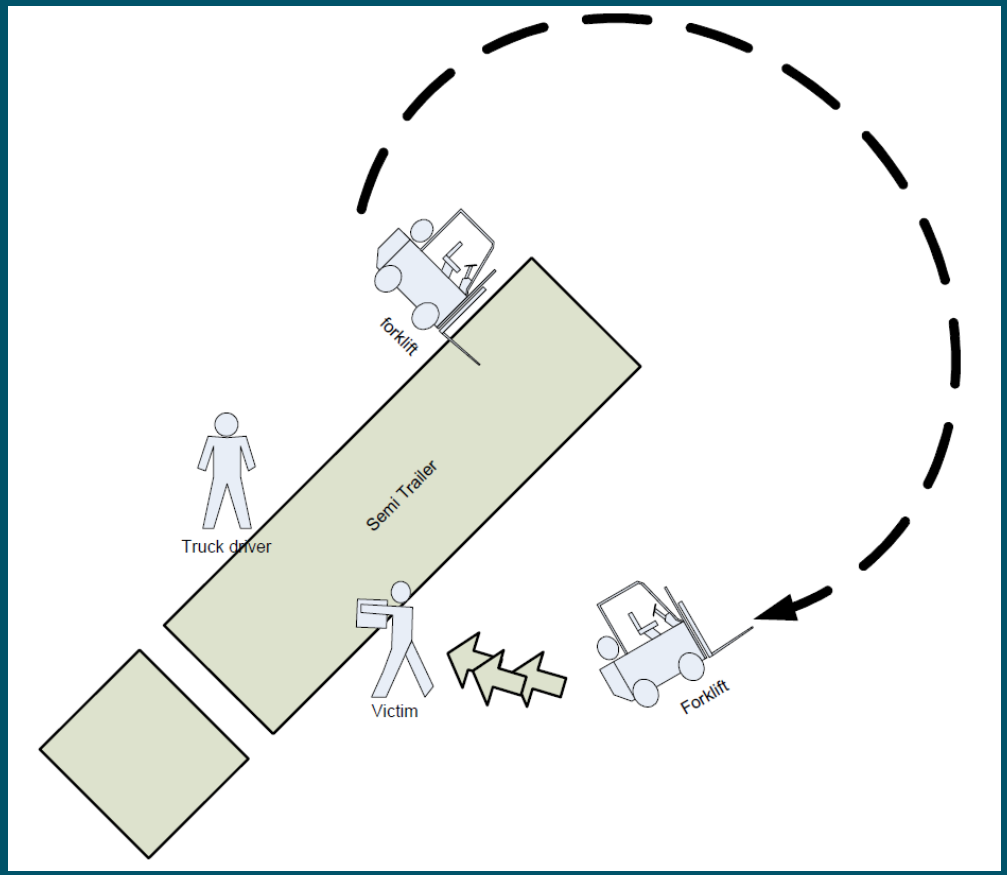
- Operator crushed between forklift and semi-trailer
- Training three years prior to incident
- Forklifts maintained onsite w/on call manufacture representative support

Facts (cont'd)

- Helping truck driver with straps to secure load
- Facing trailer with forklift directly behind
- Forklift engine left running, forks on ground and brake
- Gravel surface
- Only two forklifts and other was in repair
- Post incident – forklift moved Without releasing brake

Assumptions

- Brakes overheated and failed
- Back-up alarm system did not sound



Recommendations

- Shut down power completely before exiting (neutral and parking brake)
- Provide on-going evaluation and feedback for operators
- Maintain equipment in safe operating condition
- Encourage employees to report unsafe conditions

CAUSE OF DEATH
Blunt chest trauma

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Fatality Investigation Report OR 2007-11-1

Salesman killed when forklift falls off truck loading ramp

SUMMARY

The actual forklift in this incident (with identifying images masked out) was a stand-up model for warehouse work.

On June 4, 2007, a 37-year-old forklift salesman was crushed, and died 2 days later, after a forklift he was delivering for a customer fell off the dock plate between a flatbed truck and a loading dock. The truck had been backed up to the loading dock, the parking brake set, and the transmission placed in neutral. However, the truck wheels were not blocked against motion. The salesman initially operated the forklift to release tension on the winch line as the truck driver removed the binding chains. As the truck driver went to store the binding chains, the salesman backed the forklift off the bed of the truck. The truck bed was 9 inches below the loading dock, and the dock plate connecting the truck to the dock was set at an incline. The drive wheels were on the front of the forklift (to the rear in this instance), and as the salesman accelerated to go up the incline, the drive wheels on the bed of the truck pushed the truck away from the dock. The dock plate slipped off the truck bed and the forklift fell 4 feet to the ground. The victim was crushed between the forklift and the loading dock.

CAUSE OF DEATH: Blunt chest trauma

RECOMMENDATIONS

- **Before loading or unloading operations, completely block the truck and trailer against motion.**
- **Employers must train operators of powered industrial trucks in safe operating procedures and hazards associated with particular operations, such as loading and unloading from transport vehicles.**
- **Employees need to clearly communicate with coworkers when working together on or near moving machinery.**

Keywords: Machine Safety
Publication Date: October 1, 2009
This report is public information and free to copy

Operator

- 37-year old sales/account manager
- 10 years as forklift driver
- Recertified ~10 months prior
- With employer for 2.5 years
- Responsible for deliveries

Facts

- Tow truck operator backed truck to dock
- Dock 9 inches higher than loaded flatbed
- Salesman climbed on flatbed to help unload

Facts (cont'd)

- Salesman accelerated the forklift onto dock plate
- Weight of forklift lowered bed behind rear axle
- Salesman fell off the forklift and crushed between forks and load dock
- Drive wheels pushed truck away from the loading dock

Recommendations

- Before loading/unloading block the truck and trailer against motion
- Train on loading/unloading hazards from transport vehicles
- Clearly communicate with coworkers when working together on or near moving machinery

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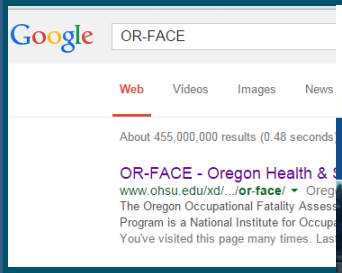
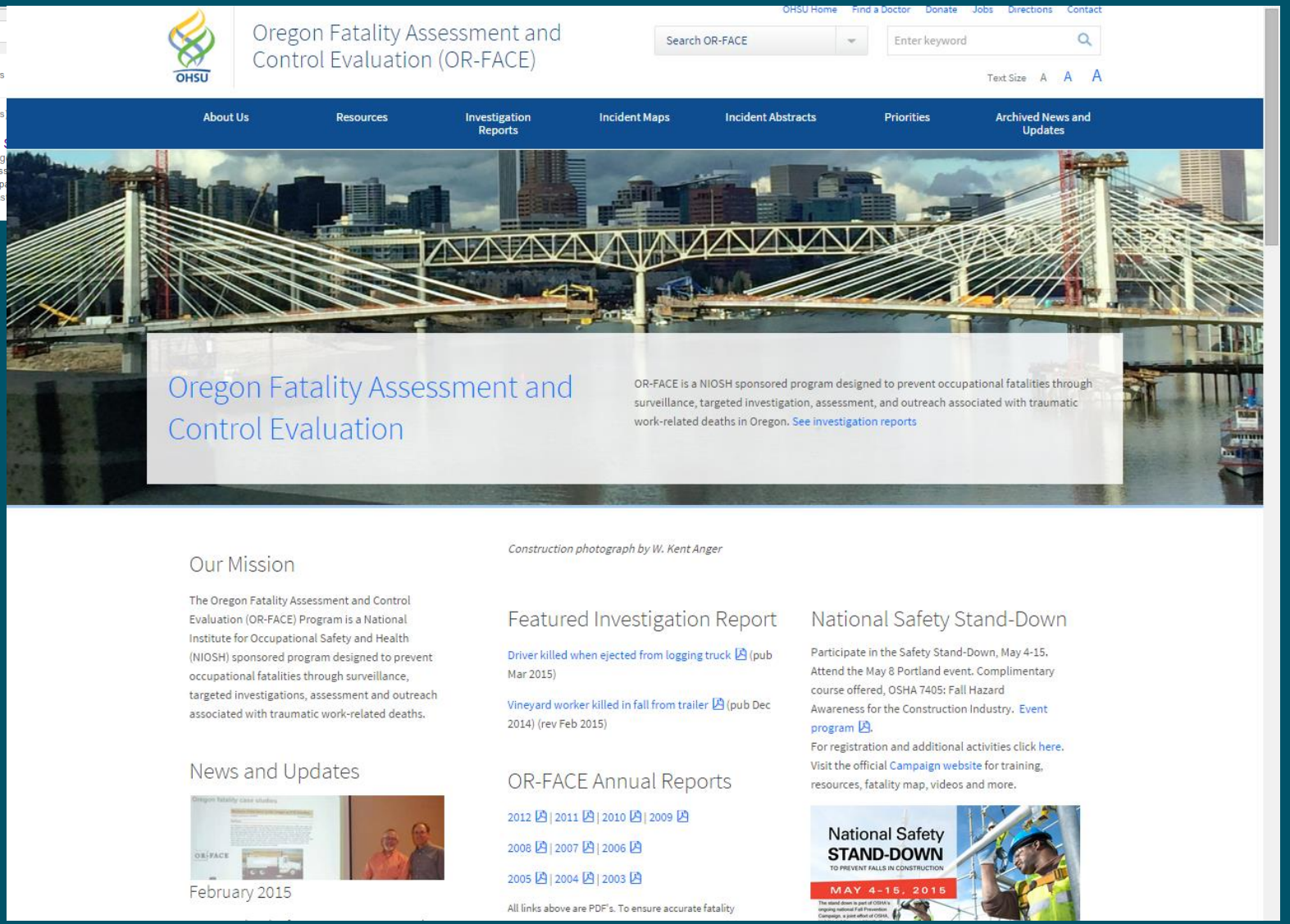
Outreach

- Website
- Interactive map
- Publications
- Interventions
- Presentations

Website

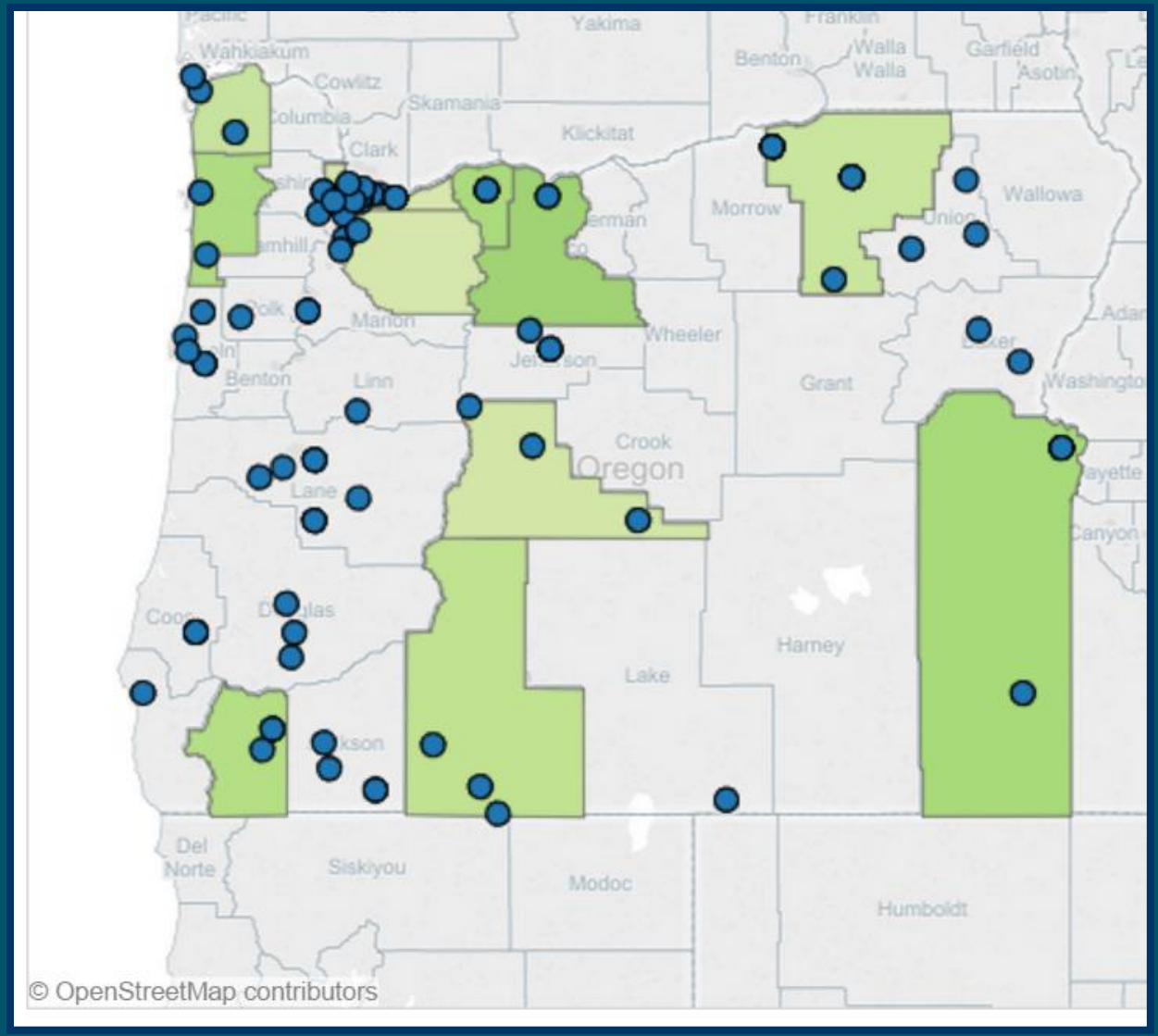
Google OR-FACE





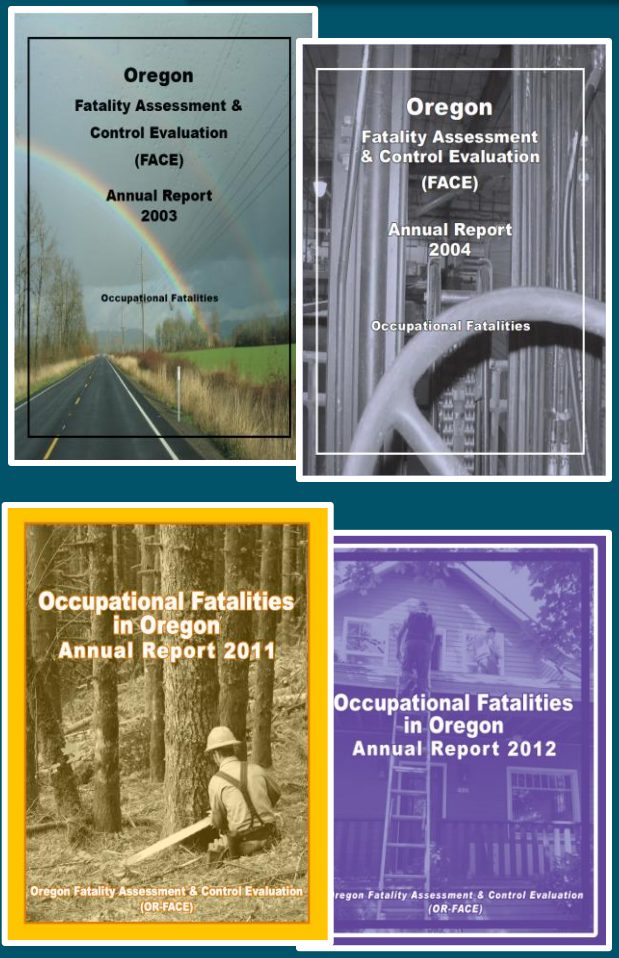
Interactive Maps (2003-2012)

Transportation Industry



Publications

Annual Reports



- Published 18 months
- Abstract of cases
- Based on report review
  - OSHA investigation
  - Police investigation
  - Medical examiner
    - Pathology
    - Toxicology
  - National Transportation Safety Board
  - US Coast Guard

Publications

Hazard Alerts

- One page
- Bulleted recommendations
- Abstract of similar cases

OR-FACE **Fatality Alert**

November 2003

Truck mounted pile driver presents fatal electrocution hazard

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1 OR2003-36-01

2 OR2003-37-01

3 OR2003-37-01

Fatal Fall Alert

Gravity Kills

In 3 years, 22 Oregon workers died in falls. Risk increases greatly over age 35, and again over age 65.

Fall hazards are everywhere. Fa

Please observe the following s

Recommendations

- Make sure ladder is in good condi and locks are secure. Set base 1/4 length from wall, supported at top rails extending 3-4 ft above dismo
- Three-point rule: Get a firm grip w of four limbs, especially in icy cor
- Beware losing your balance from unexpected release of a weight yo carrying or pulling, or from overre

Fatal Stories, 2003-2005

LADDERS

Store ladder A female retail clerk fell from the sixth step in a company storeroom, and died 5 days later. She susta the left knee and femur. The clerk was admitted to a local she developed sepsis.

Icy lumber load A lumber yard worker was killed when ft off a loaded semi-trailer. The worker placed an extensio the load and climbed to the top to strap it down. Ice had f of plastic covering the load, and the worker apparently sli stepping from the ladder.

Roof exit A school custodian died after falling about 12 f He used a fully extended extension ladder to access a roo balls. The spring-loaded locks were not set properly, whic custodian to climb the ladder successfully, but the ladder he put his weight on it to return to the ground.

ELEVATED LEDGE

Concrete tank A construction worker died after falling at concrete tank. The worker was removing concrete from a water treatment tank that was being dismantled, and was the fastening strip from the top edge. He was either bendi kneeling to perform this task, and apparently lost his balan stood up to move to the next section.

Conveyor belt A miner fell 12 ft onto a concrete floor fro of an elevated conveyor at a sand and gravel operation, a day. The miner and two coworkers were installing a new c The miner was standing on a crossbeam, pulling on a rop belt. The rope unexpectedly came loose, causing him to f

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OR-FACE **Snag Hazard Alert**

From 2010 to 2013, 10 Oregon workers in the Logging and Forestry industries died after being struck by trees. Hung limbs and snags in trees are a recurring contributing factor to occupational fatalities among tree fallers in Oregon.

Please observe the following safety tips:

- Scan for hung or snagged trees and limbs in your own and others' cutting stri communicate with each other about these hazards.
- When faced with a hazardous situation, stop work and seek assistance from a a cutting partner, or a more experienced worker.
- If a snag or hang-up is identified, after seeking assistance, work with your par identify the best method for alleviating the hung limb, tree or snag (OR-OSHA working under a lodged tree or the cutting of a tree where another tree is lodg
- Employers should ensure that workers are trained and understand how to saf to snagged or hung limbs and other hazardous logging conditions.

Fatal Stories

Case 1: A 28-year-old self-employed tree cutter was killed after he was struck by a dislodged treetop and crushed between previously felled logs and underbrush. The victim had cut a small second growth tree, but it had hung up in another tree as it fell. He was attempting to fall another larger tree when the lodged tree broke free and fell on him

Case 2: A 51-year-old logger was killed after he was struck by a falling snag that was caught in the tree he was cutting. He was working on a steep hillside, and his partner was 250-300 yards away. His partner searched for the victim after he had not heard the victim's saw in 40 minutes. He found the victim dead with a tree on top of him. The victim had 25 years of logging experience.

Case 3: A 48-year-old tree faller was killed after a snagged tree fell on top of him. The victim was working as an independent contractor cutting trees. He had just felled a large tree on a hillside, which uprooted a rotten tree on its way down. The rotten tree hit the victim from behind and pin underneath. He was working alone at incident. The victim died at the scene injuries.

Case 4: A 41-year-old logger was kill was struck in the back by a falling tree was working as part of a two person l cutting alder trees on private logging l minute intervals, each worker would t to listen for their partner's saw. The vi performed this safety check, but did n partner's saw. He went to check on th found him face down with a 12-inch d foot long treetop across his back. App the victim cut down his last tree, it col nearby tree, which caused the top of t to break apart and fall over onto the v was conscious when his partner found on his way to the hospital. He died fro chest trauma.

PLEASE POST Oregon Fatality Assessment and Control Eva 503-494-2281 www.ohsu.edu/c

OR-FACE **Crab Fishing Hazard Alert**

During 2000-2009 70% of commercial fishing deaths off the US West Coast were caused by drowning. Dungeness crab fisheries had the highest number of fatalities with a rate of 310 per 100,000 full-time equivalent workers. Falls overboard accounted for 24% of all fatalities. None of the victims of falls overboard were wearing personal flotation device.*

*DHHS (NIOSH) Publication Number 2011-104, Fatal Occupational Injuries in the U.S. Commerical Fishing Industry: Risk Factors and Recommendations West Coast Region

Illustrator: Joseph Boquiren

Please observe the following safety tips:

- **Wear personal flotation device whenever on deck and every time the bar is crossed**
- **Train crew on man-overboard procedures and practice at least monthly**
- **Use the most current weather forecasts and bar information**
- **Use personal locator beacons that are water activated for visibility**
- **Get vessel stability evaluations to aid in loading properly**
- **Utilize Coast Guard vessel inspections**

Fatal Stories

Case 1: The 43-year-old crab boat captain survived when the vessel he was operating capsized but was pushed up on the jetty. Two crew members (44 and 55 years-old respectively) died after being swept overboard. None of the crew wore life vests or personal floatation devices, nor was there time to do so when the waves hit. They were attempting to cross the bar in rough seas. The victims were part of a three person crew that was preparing for the opening of crab season. When the boat was attempting to cross the bar, seas were estimated at 14 to 16 feet. As it tried to exit it got sideways to the breakers, one end was pushed up and the next wave turned it was preparing for the opening of crab season. The boat was roughly three miles out from a bay when it became unstable and began to tilt. Before the crew could determine the problem, the boat was hit by a large wave and tipped on its side. The two deckhands were able to put on personal flotation devices and swim to a nearby boat where they were pulled onboard. The captain was apparently trapped inside the wheelhouse when the boat fully capsized and he was unable to escape.

Case 3: A 38-year-old commercial fisherman was killed when his fishing boat capsized. The 21-foot boat capsized in high waves after an engine failure. Witnesses called for help and reported that there were two men on the boat. Initial responders were

Publications

Blogs

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Oregon and the Workplace

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OR-FACE Publishes More Toolbox Talk Guides

Safety communication is an integral part of maintaining an injury prevention culture. Its implementation can be in a variety of methods such as warning labels, safety trainings and meetings, hazard alerts and informal communications between supervisors, workers, and co-workers. In her ~30 years of experience as a safety and health professional, Illa Gilbert-Jones, program manager of the Oregon Fatality Assessment and Control Evaluation (OR-FACE) program, has learned that increasing the level of interaction between supervisor and workers about safe positively influences safe behaviors. Moreover, if the interaction is about real world, relatable events, the impa can be significant.

Toolbox talks are a common form of safety communication, especially in construction but they have been used daily pre-shift meetings in general industry. OR-FACE has created several toolbox talk guides and recently published four. These two-page documents are based on information gathered from Oregon fatality investigations. One side of the toolbox talk is a simple line drawing for viewing from a distance and for ease in understanding the key elements of the incident. At the bottom of the line drawing are key actions to prevent a similar incident. On the other side, are instructions for leading the toolbox talk, a narrative of the incident, bulleted items that reiterate the key prevention actions and a list of questions to facilitate a discussion on cure practices, unsafe conditions, and commitment to an action plan.

The overarching goal of these toolbox talk guides is to provide supervisors/leaders with documents to increase interaction and positively influence safe behaviors. The format uses evidence-based safety communication principles and real-world (Oregon) relatable events.

SHARE

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Oregon and the Workplace

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OR-FACE presents at logging and construction safety events

Clark Vermillion thanks Illa Gilbert-Jones on behalf of the CSS.

Oregon Fatality Assessment and Control E
FACE) presented at the January meetings
Washington Contract Loggers Association
Portland Construction Safety Summit (CS

Jeffrey Wimer, OR-FACE Safety Consultan
State University Manager of Student Logg
presented OR-FACE logging data and resc
500 attendees at the annual WCLA Safety
near Olympia on January 17. The resourc
and OR-FACE will contribute to the Washi
Logger Safety Initiative. The Oregon for
industry had 91 FACE cases from 2003-20
second in the highest number of total fata

The Oregon construction industry ranks thi
occupational cases. Illa Gilbert-Jones pre
construction data and resources to 40 mer
January 20 meeeting. Construction and l
risk industries in Oregon and providing out
information to these two industry groups a
FACE mission to "prevent occupational fat
surveillance, targeted investigation, assess
outreach associated with traumatic work-re

Oregon." You can find both presentations and resources on the OR-FACE website.

Submitted by Illa Gilbert-Jones, CIH, CSP, Oregon FACE Program Manager/Field Investigator.

SAIF agricultural safety seminars

Instructors Kirk Lloyd and Kevin Pfau.

SAIF Corporation is Oregon's not-for-profit workers' compensation insurance company. For the past 20 years SAIF has been providing free Agricultural Safety Seminars throughout Oregon. The well-attended 2014-2015 seminar series included 27 training sessions held in 18 cities and eight of the trainings conducted entirely in Spanish.

In the summer of 2014, OR FACE met with seminar organizers Kirk Lloyd, Kevin Pfau, and Chuck Easterly to discuss collaboration and intervention based on Oregon agricultural fatality data. Kirk and Kevin have been developing the seminar curricula for many years and are also the primary English session presenters.

OR FACE along with nearly 80 farm owners and workers attended the seminar held in Clackamas on February 26. The success of these seminars is evident in attendees returning year-after-year. One attendee at the Clackamas seminar mentioned that she started coming the 2nd year it was offered and hasn't missed one since. Kirk did an exceptional job in using personal stories that combined OR-FACE agricultural data and concepts in communication across generations. Kevin covered electrical safety and lessons learned from serious injuries. He facilitated successful group breakout sessions in which

attendees analyzed the causes of a tractor fatality and an amputation case. Descriptions of the topics covered can be found here.

OR-FACE Tool Box Talk Guides: *Evidence-Based Structure*

FRONT: Scripted Story

High urgency alert word in color

Line drawings increase understanding and viewing distance

Top 3 preventive acti… in bullets

Toolbox Tall…

Load of Lumb…

INSTRUCTIONS
side facing you…

Our safety talk toda… framer from another company who died when a load of lumber fell on him. He was on a ladder to access a stairwell h… house while a roug… bundle of lumber to… weighed at least 60… maximum possible… tipped over. The lu… the victim's head ar… against the ladder. … he fell to the first flo… probably died from …

So here are son… happening where we work.

- Never exceed the load or extension limits of a lift or crane. You should be trained before you operate a lift or crane, and I can make sure you get the training.
- Never work direc… are required to b…
- Use a spotter an… advance, and to…

ASK: "Does any… Pause for…

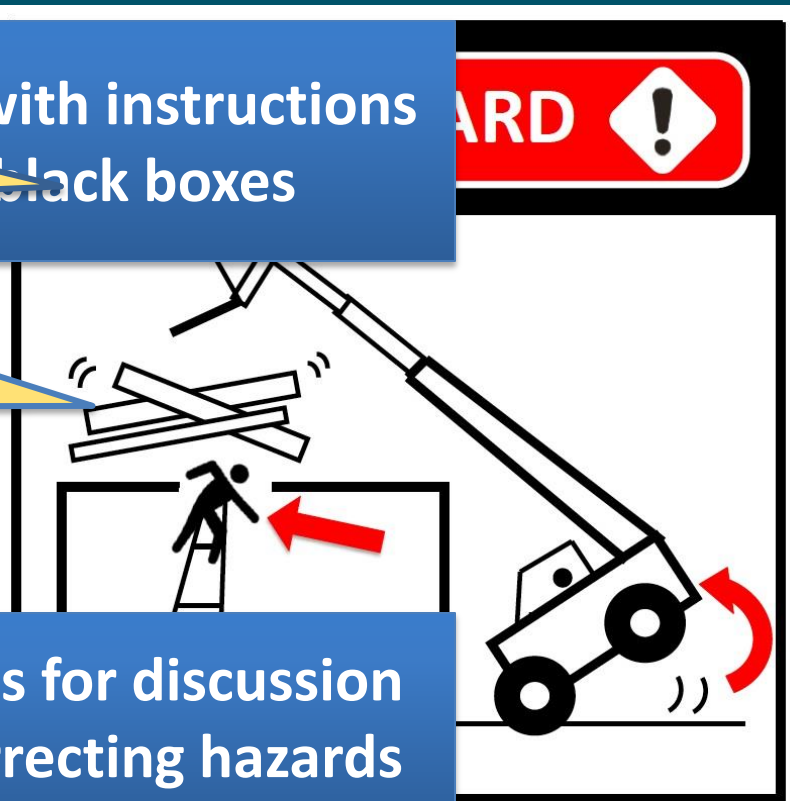
END WITH ACT…

- "Are there any… their limits?"
- "Does anyone have ideas for improving our communication systems?"
- "What do you all do to make sure people are not under loads being moved?"
- Discuss a similar situation at your current site.
- Express your commitment to training people for each machine they operate.
- Commit to follow-up at the next safety talk.

BACK: Line Drawing

…ipt with instructions …in black boxes

Prompts for discussion and correcting hazards



- Never exceed load or extension limits of a lift or crane
- Use a spotter and communication system to prevent lifts over workers
- Never work directly under a load

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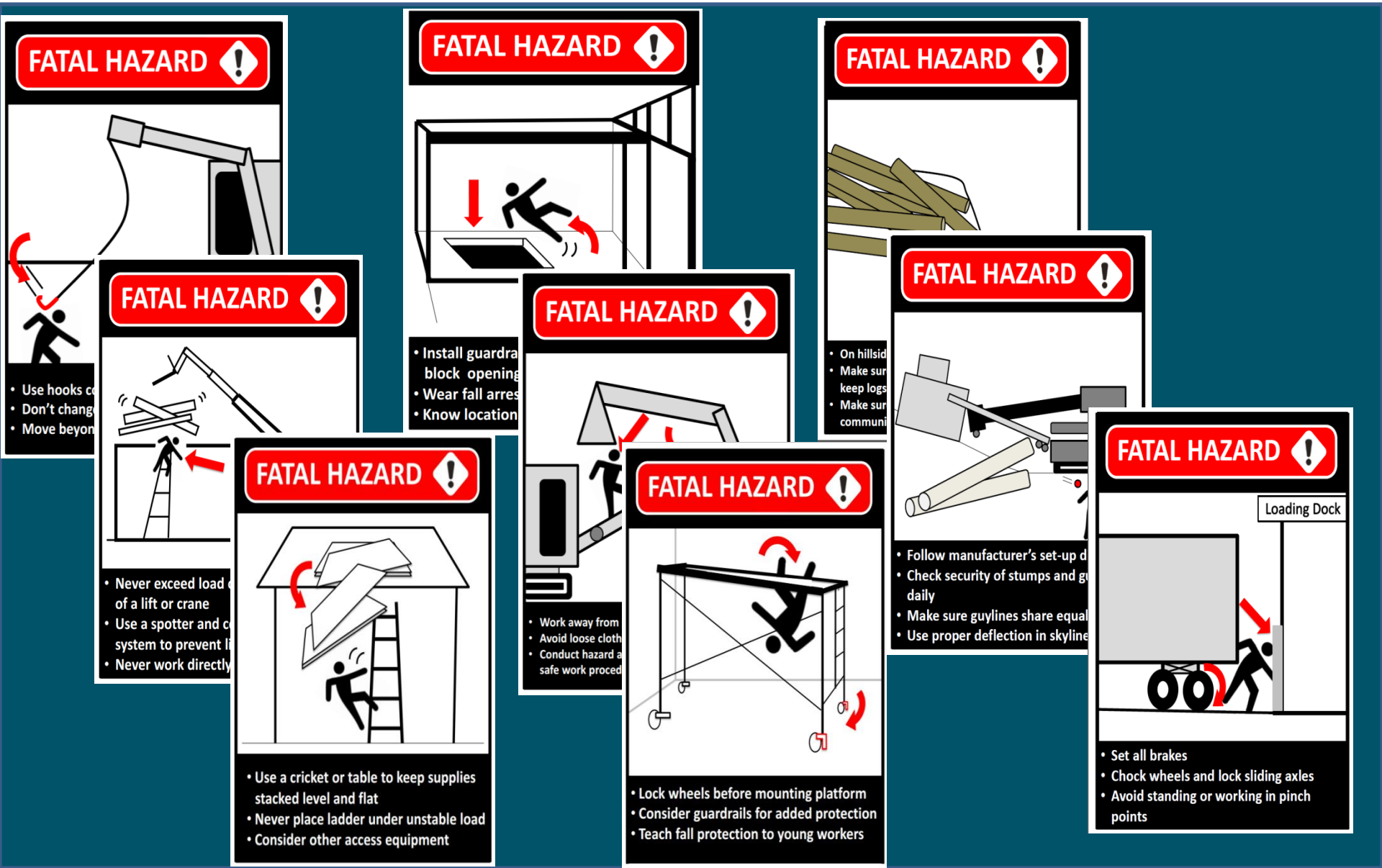
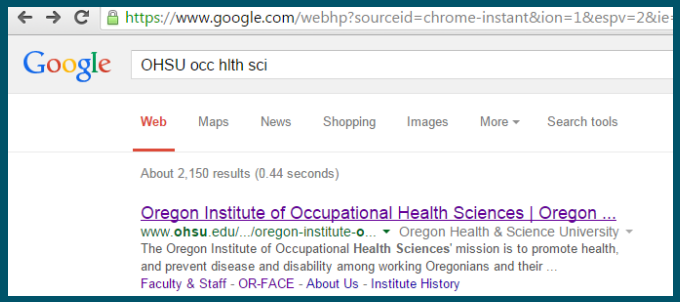
Publications



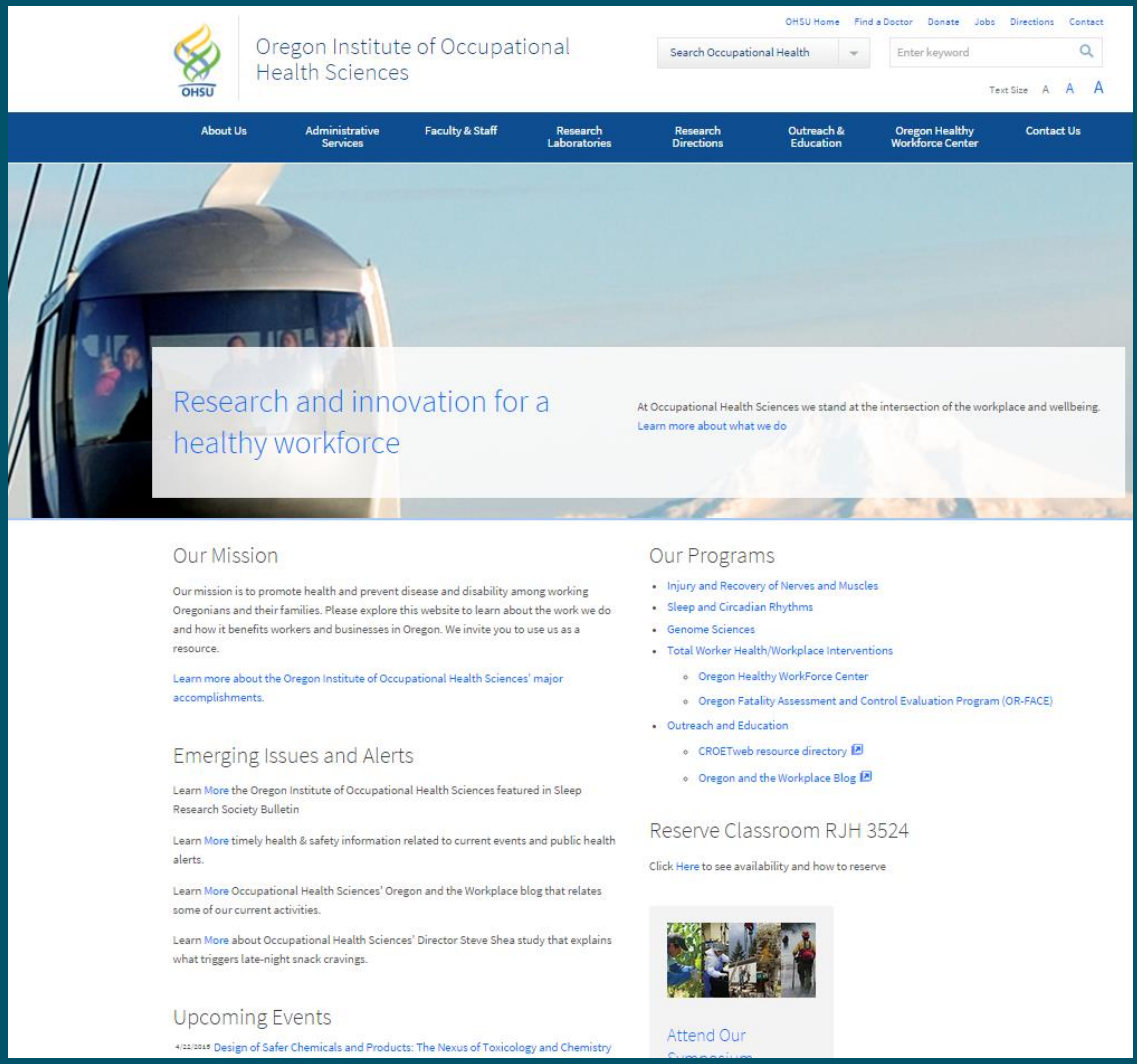
Other Resources

Google "OHSU occ hlth sci



Oregon Institute of Occupational Health Sciences

- Safety toolbox talks
  - Online videos
  - Newsletter
  - Blog



OR-FACE

SHIFT Project

Proposed Projects

- Partner with OTA-Present at Annual Leadership and Safety Summit
- Mobile system to promote and evaluate
  - toolbox talks
  - hazard alerts
- Social network analysis
  - Guide future dissemination