

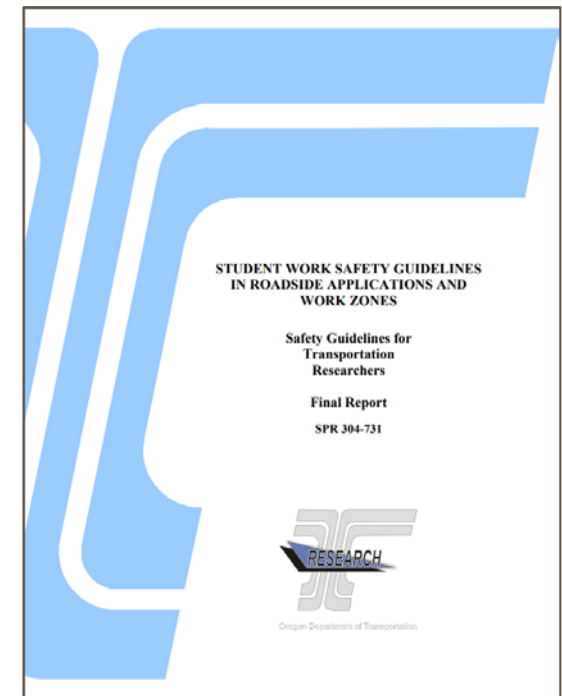
Student Education and Training Needs for Safety in Roadway Engineering Field Work

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Civil and Construction Engineering
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Introduction

- Many state DOTs contract with universities, colleges, and other learning institutions for research
- Workers present on roadways are exposed to hazardous conditions.
 - Safety training is regularly provided to those workers (Boston University, 2011)
- There is a need nationally for roadside and on-road worker safety training specifically targeted at **student workers**



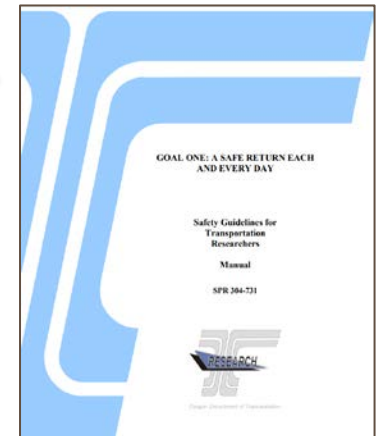
Introduction

Study Goal

Enhance the safety of student researchers working in DOT right-of-way

Study Objective

Develop student safety training resources for national dissemination to state DOTs and universities



Tasks

1

- Literature review on existing roadside worker safety
- Identify safety issues and training topics mentioned in literature

2

- Conduct a survey (online) of roadway contractors and state DOTs regarding student safety and safety training practices

3

- Analyze survey responses and literature review results
- Recommend safety training content and formats

4

- Develop video content and video format
- Work with ODOT Reprographics to create video

5

- Develop manual for student worker safety training
- Place video and manual on-line for public access

Documentation of Safety Issues and Existing Practice

- Literature review on roadside worker safety
 - ODOT, OSHA, and other organizations
 - Safety videos, training resources, academic papers



Ref. No.	Name	Citation	Summary
1	ODOT-2016 WorkZoneFactSheet	OregonDOT 2016	ODOT published some useful tips for worker safety in construction work zones. It lists some facts and guidelines for workers before entering the work zone area.
2	2011 Oregon Temporary Traffic Control Handbook (For operations of three days or less)	OregonDOT 2011	This handbook includes guidance on temporary traffic control, from general standards and practices to incident traffic control.
...
...
39	ODOT Safety Calendar 2016		This calendar provides several safety tips on the cover of each month.

Documentation of Safety Issues and Existing Practice

- Literature review on roadside worker safety
 - Summary of safety issues for student workers and common safety training practices
 - Frequency mentioned >>> importance



		Expect the unexpected. Assume drivers don't see you	Beware of complacency - in yourself and coworkers	Avoid having your back to traffic or use a Spotter to watch your back for you	Worker Safety Apparel	Personal electronics use			
					Wearing ANSI Class 2 or Class 3 high visibility safety garments appropriate for the site conditions	Do Not use personal electronics while operating equipment	When you need electronics for your job, remember to look up often and in alternating directions	Practice working with any electronic devices you need to use before getting on the jobsite	Only use personal electronics in approved safe zones or during breaks
1	ODOT-2016 WorkZoneFactSheet	1	1	1	1	1	1	1	1
2	2011 Oregon Temporary Traffic Control Handbook				1				
...
SUM		11	7	5	15	1	2	1	2

Documentation of Safety Issues and Existing Practices

- Most commonly mentioned topics:
 - Wearing high visibility safety apparel
 - Work zone laws/regulation enforcement
 - Work zone infographic study
 - Sign and device spacing and placement
 - Traffic control plans and worker safety planning
 - Flagging and other traffic control measures
 - Previous case studies
 - Expect the unexpected
- Additional topics identified:
 - Personal electronics use
 - Fatigue (need for rest)

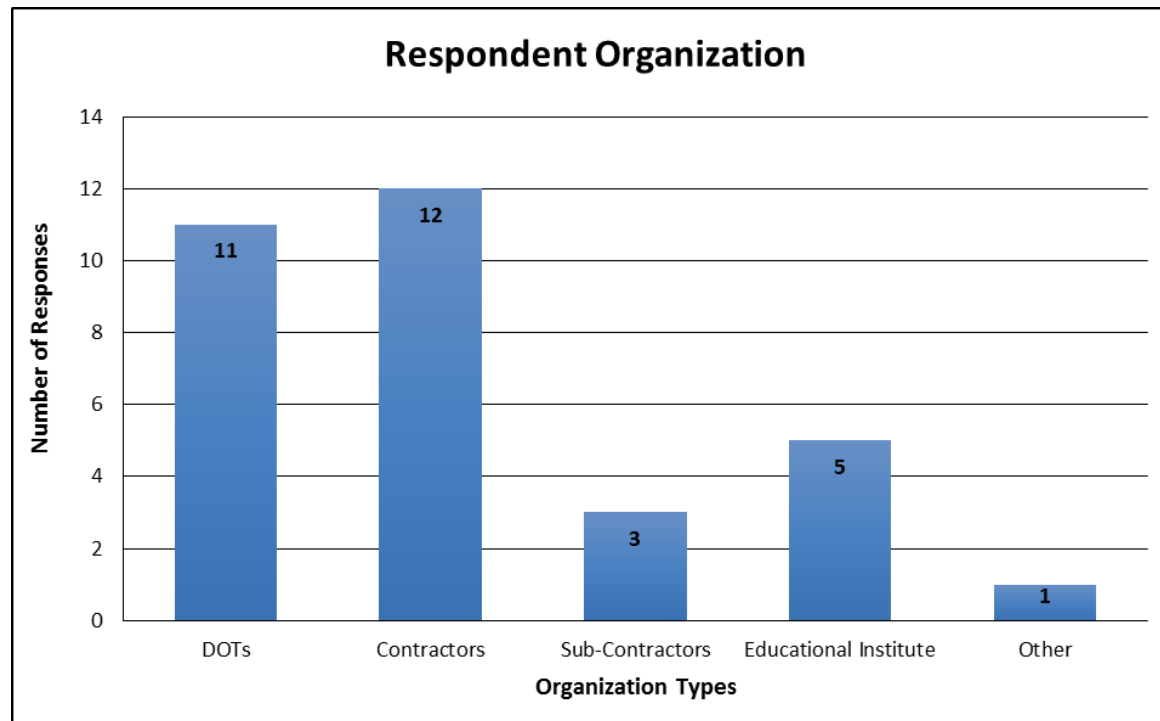


Student Worker Safety Survey

- Aim:
 - Document common student worker on-site behavior
 - Identify suggestions, barriers, concerns related to safety training for student workers
- Target participants:
 - AGC Oregon-Columbia Chapter Highway Council members
 - AGC-Washington heavy civil, roadside work, and asphalt contractors
 - DOTs in all 50 states
 - OSU and PSU faculty
- Questionnaire content:
 1. Respondent demographics
 2. Key terms and definitions
 3. Student worker experience
 4. Student worker safety concerns
 5. Safety training recommended for students
 6. Opinion about student worker safety training
- Distribution:
 - Link to survey on-line (Qualtrics) sent via e-mail

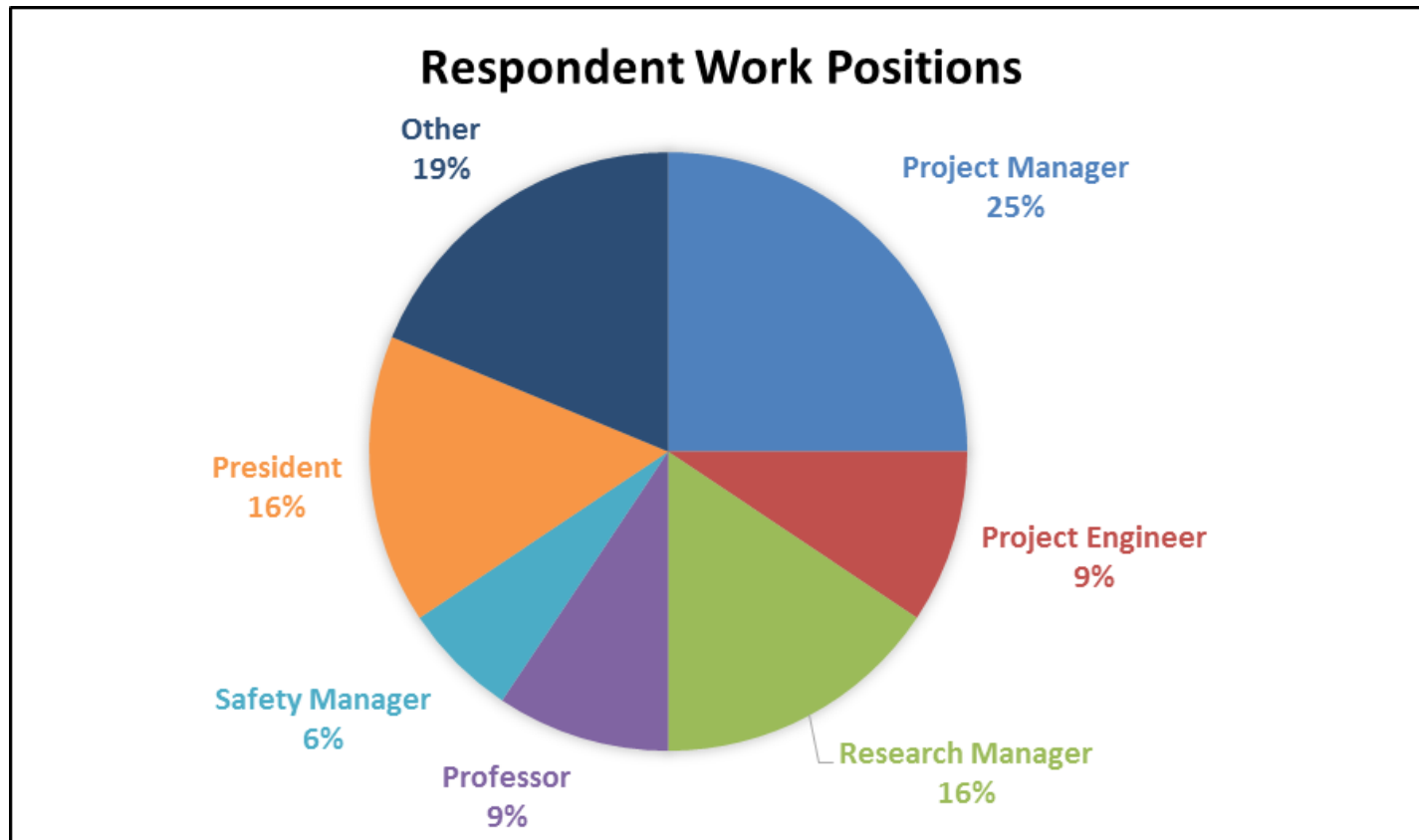
Student Worker Safety Survey – Results

- Responses:
 - 52 total responses
 - 28 complete responses (54%)
 - Demographic info from 32 respondents (62%)



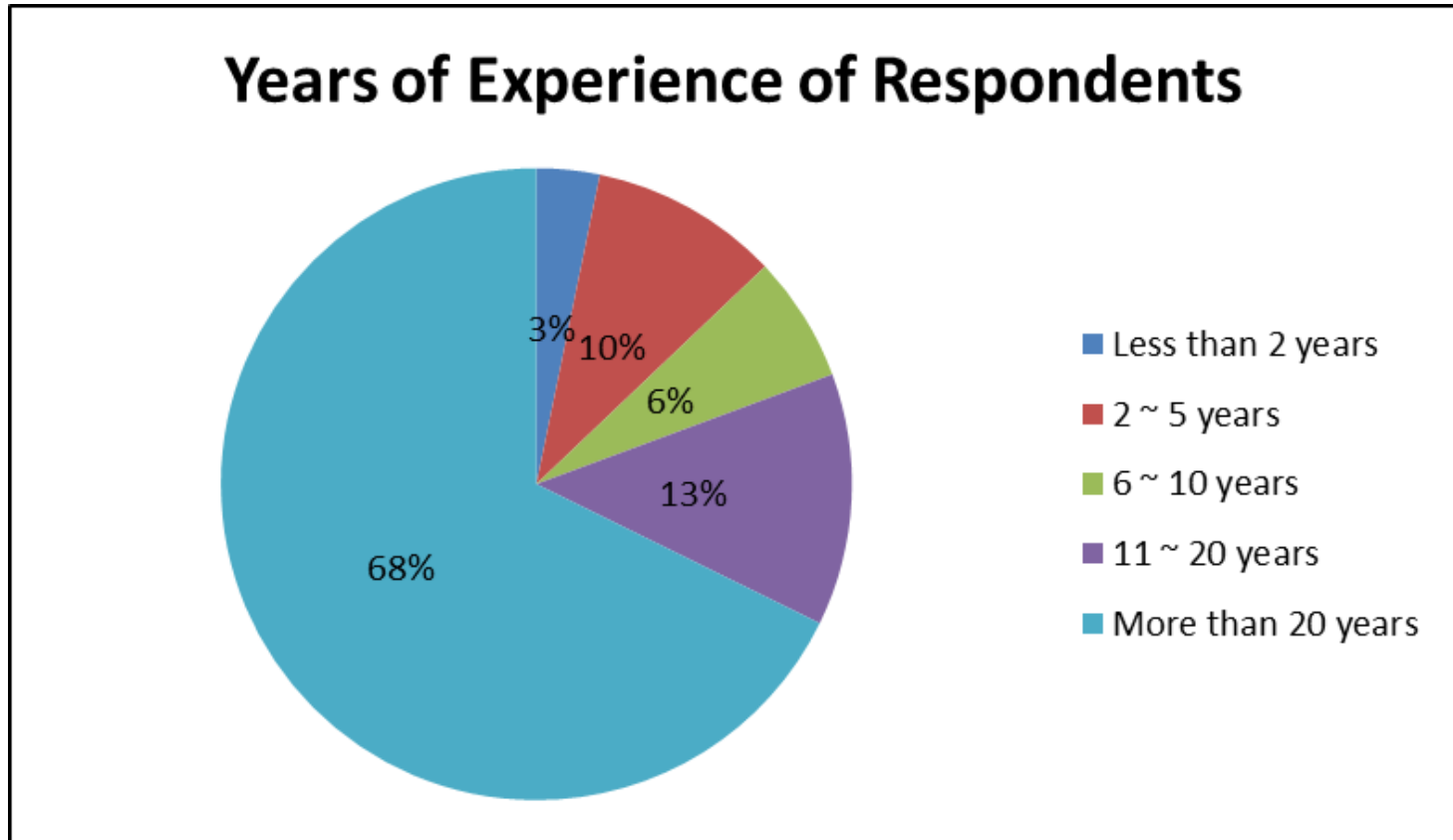
Student Worker Safety Survey – Results

- Respondent work position (n=32)



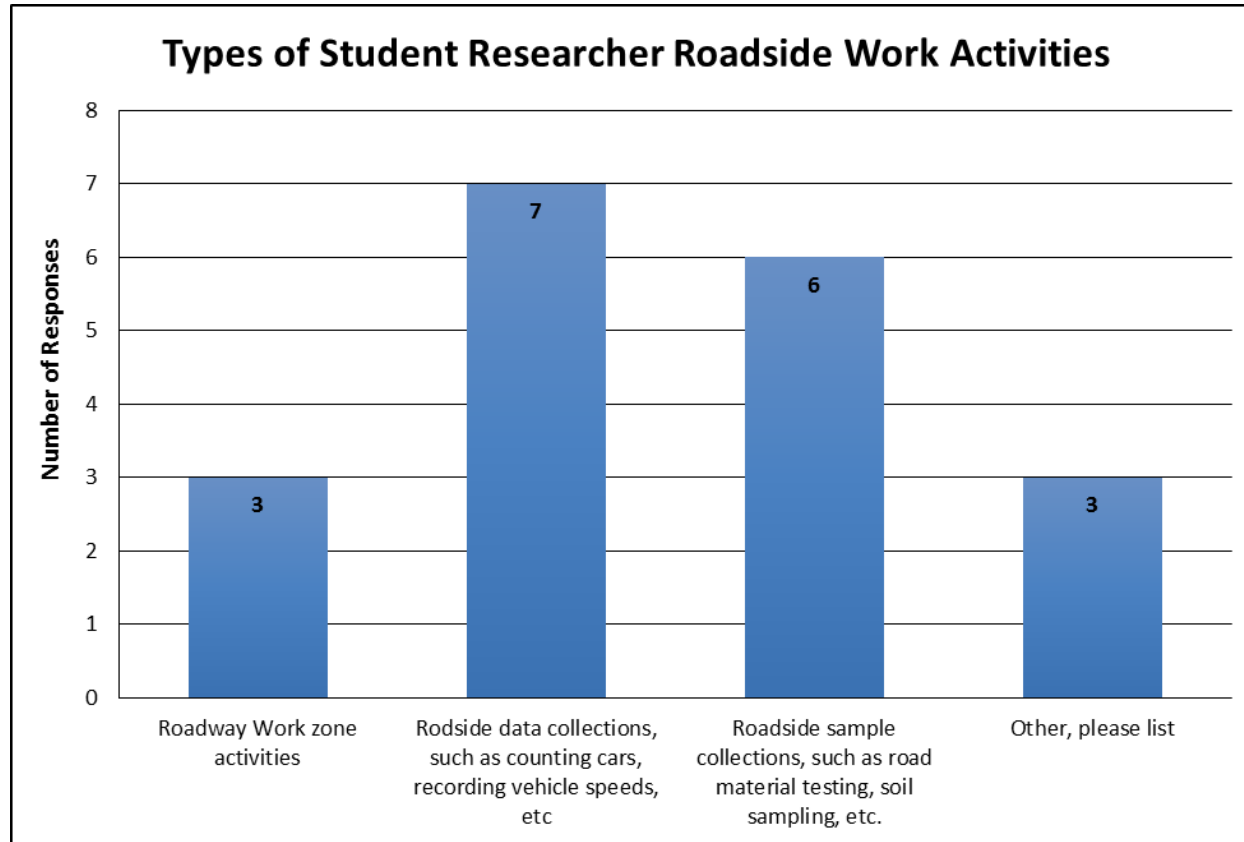
Student Worker Safety Survey – Results

- Respondent years of experience in the industry (n=31)



Student Worker Safety Survey – Results

- What do students do on your projects, and where? (n=11)



Student Worker Safety Survey – Results

- In which situations do students perform well and not perform well?

Situations that Student Workers Perform Well In

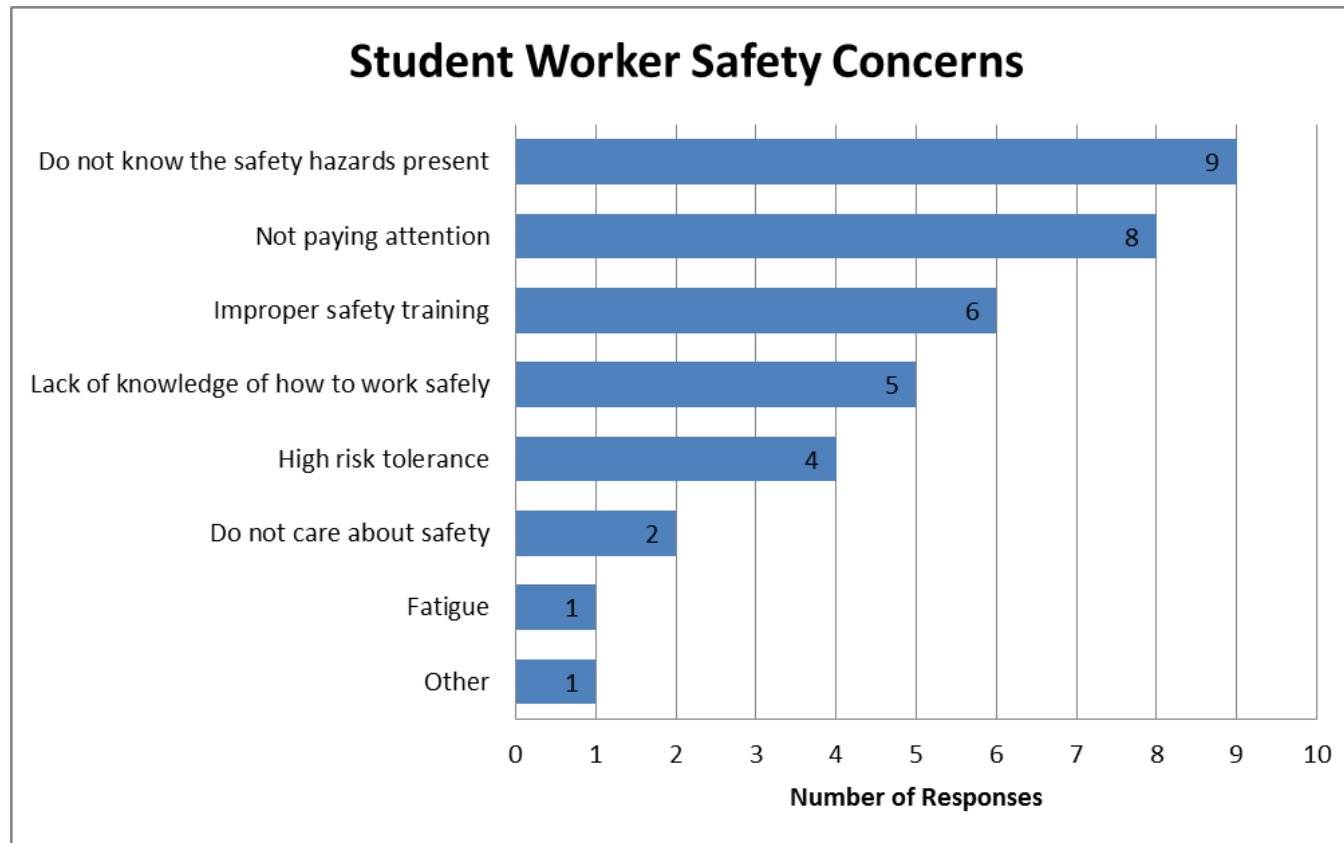
- When an experienced person is with them, supervised
- When there is the opportunity to express to them the importance of paying attention to safety and the dangers that exist
- With supervision from faculty and professionals to remind them of safety procedures
- Under supervision with proper safety equipment
- During collection of data
- When they have good preparation and safety training from their professor and the state DOT
- At the site, when they are typically in safe areas
- Students have a safety briefing by our staff or M&O staff. Their performance is based on our training.

Situations that Student Workers DO NOT Perform Well In

- When they are not supervised by someone experienced
- When in a hurry and no supervision
- When there is a culture challenge that the student researcher is just not experienced in the dangers being in a work environment
- Absent training and instruction; also may take more risks
- Active construction projects (usually a communication issue)
- When they visit research sites without proper preparation, communication with the state DOT, or safety training
- Traveling to and from work sites. Driving an automobile to the observation site is a risky task.

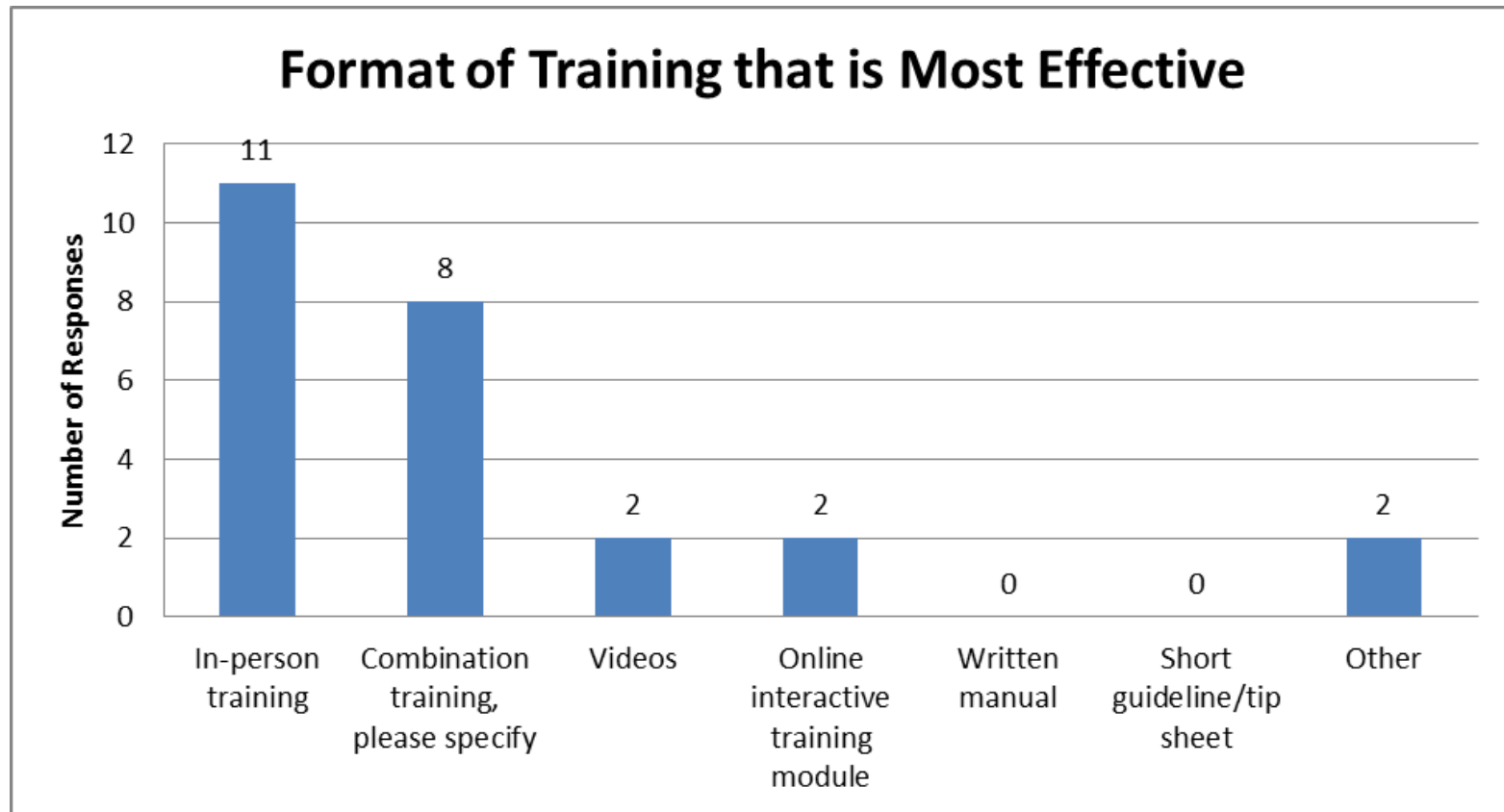
Student Worker Safety Survey – Results

- What concerns you most when you see students in construction work zones? Select all that apply. (n=11)



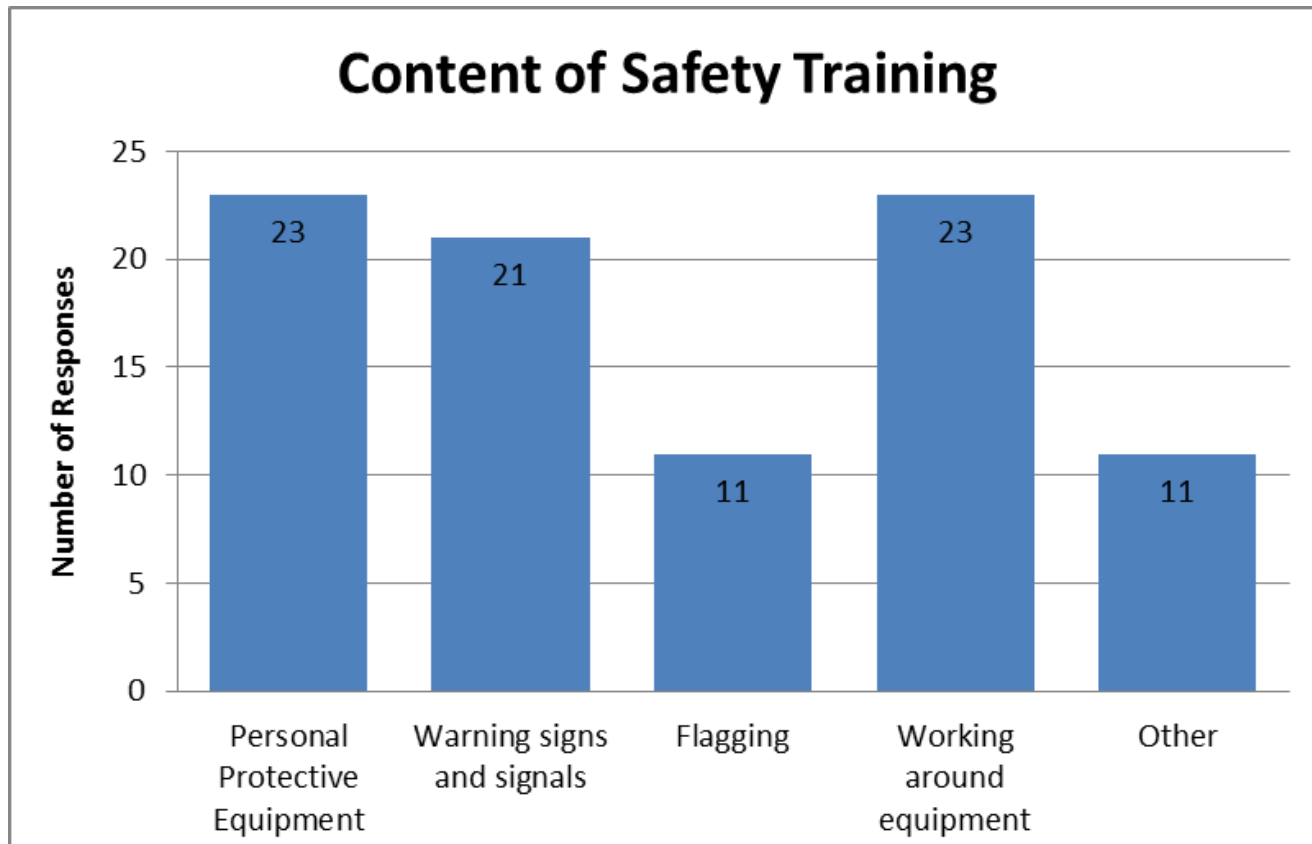
Student Worker Safety Survey – Results

- What format of safety training is most effective? (n=25)



Student Worker Safety Survey – Results

- What safety training content should be included? (n=25)



Student Worker Safety Survey – Results

- General comments:

- *DOT personnel:*

- A safety plan is developed for each project.
- Job safety analysis (JSA) discussion prior to boots on the ground for each shift/day.
- Proper preparation and safety training, and oversight by the professor and state DOT personnel.
- Assume drivers of cars may have accidents and lose control of their vehicles.
- Education, limit exposure, and if exposed, need proper safety equipment in training.

- *Contractors:*

- Respect that contractors have a project to build, make sure not to interfere with production, and take time to understand your surroundings.
- No cell phones/electronic devices onsite.
- Students don't realize the significance of the potential hazards.
- Need to work under the direction of the project superintendent or his/her designee.

Safety Training Video

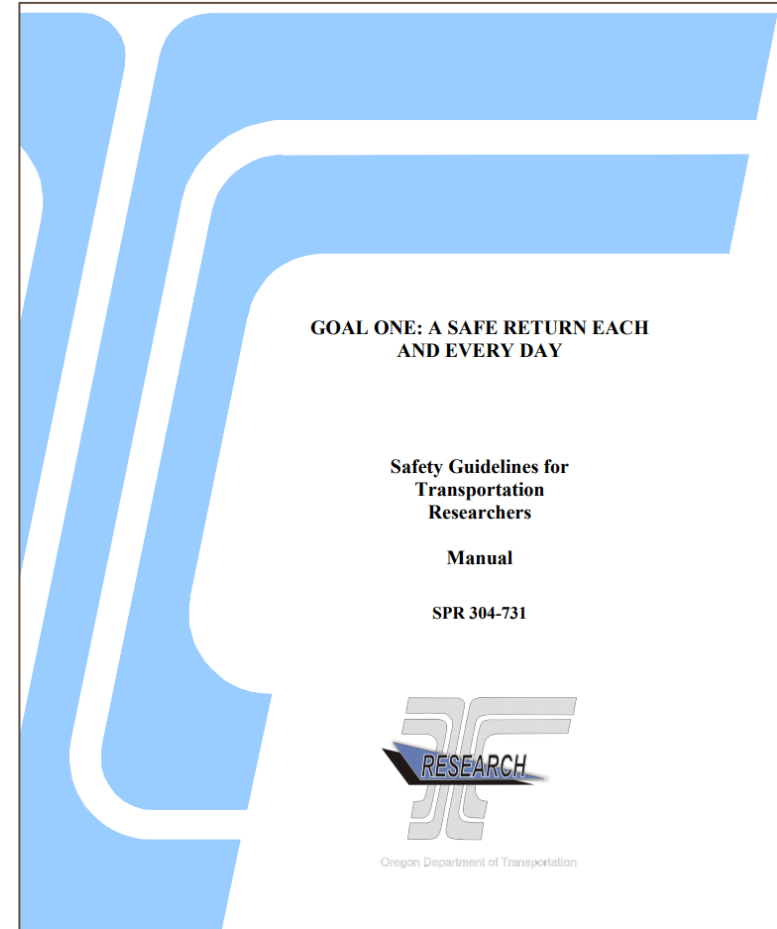
- Video available on-line at:
https://www.youtube.com/watch?v=iz_fde-xtxc

“Goal One: A Safe Return Each and Every Day”



Safety Training Manual

- “Safety Guidelines for Transportation Researchers”
- Available on-line at:
http://www.oregon.gov/ODOT/Programs/ResearchDocuments/304-731_Goal_One.pdf



Safety Training Manual – Content

Section No.	Topic	Section No.	Topic
1	INTRODUCTION	3.15	Worker Behavior: Lack of Personal Protective Equipment (PPE)
2	INJURIES AND FATALITIES ON ROADWAYS	3.16	Worker Behavior: Poor Risk Assessment and High Risk Tolerance
3	SAFETY HAZARDS IN TRANSPORTATION RESEARCH ENVIRONMENTS	4	CONTROLLING HAZARDS AND WORKING SAFELY NEAR OR IN TRAFFIC
3.1	Passing Vehicles: Distracted/Impaired Driving	4.1	Safety Training
3.2	Passing Vehicles: High Speed	4.2	Make Safety Plan before going on the Site
3.3	Passing Vehicles: Visibility	4.3	Worker Safety Apparel, Lighting, and Personal Protective Equipment
3.4	Site Hazard: Nature of Roadway Characteristics	4.4	Work along with Other Workers
3.5	Site Hazard: Equipment Blind Spots	4.5	Location of Equipment and Strategically-planned Equipment Operations
3.6	Site Hazard: Loud and Noisy Environment	4.6	Safe Design of Work Area and Operations, including Warning Signs and Signals
3.7	Site Hazard: Walking Surfaces	4.7	Personal Electronics Use
3.8	Site Hazard: Unclear signage	4.8	Preventing Fatigue and Overexertion
3.9	Site Hazard: Exposure to Moving Equipment, Toxic Materials, and other Hazardous Site Conditions	4.9	React to Accidents and Near Misses
3.10	Site Hazard: Working at Elevation	5	EMERGENCY RESPONSE
3.11	Worker Behavior: Lack of Knowledge of and Adherence to Safety Practices, Procedures, and Regulations	6	REFERENCES
3.12	Worker Behavior: Incorrect Operating Procedures	7	APPENDIX
3.13	Worker Behavior: Lack of Attention to the Task	7.1	Additional Resources
3.14	Worker Behavior: Overexertion, Repetitive Motion, and Fatigue		

THANK YOU!

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