

HB 10-1014 Report
Calendar Year 2013 Annual Report of Fatal Crashes in State Highway
Work Areas
Colorado Department of Transportation

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Section 1. Purpose:

The HB 10-1014 requires the Department of Transportation and the Colorado State Patrol to annually present a joint report to the Transportation and Energy Committee of the House of Representatives and the Transportation Committee of the Senate regarding fatal crashes occurring in state highway work areas.

Section 2. Calendar Year 2013 Work Zone Fatality Data:

CDOT conducted an analysis of data derived from the Fatality Analysis Reporting System (FARS) to determine the number and attributes of work zone fatalities occurring in state highway work areas during Calendar Year 2013. The FARS System contains data on all vehicle crashes in the United States that occur on a public roadway and involves a fatality. A couple of comments about the query are necessary:

- CDOT has chosen to use the ANSI D-16.1-2007 (Manual on Classification of Motor Vehicle Traffic Accidents) federal definition of “work zones” to determine the total number of crashes/fatalities. This standard does not differentiate between construction and maintenance work zones.
- In keeping with the state statutory definition of “construction zones”, troopers and other officers investigating crashes have not indicated whether or not workers are present in the construction zone at the time of these fatal crashes. The legal definition does not differentiate between a construction zone with workers present and one without active work taking place.

As requested in HB 10-1014, the following information is provided:

A. Summary of total number of fatal crashes and total number of individuals killed

In Calendar Year 2013, there were a total of 10 fatal crashes statewide in state highway work zones in which 13 people died. This is four more crashes and five more fatalities than 2012.

B. Categorization of total number of individuals killed (DOT employees, contractors or subcontractors, other individuals)

In Calendar Year 2013, 13 citizen fatalities occurred in work zones. In 2013, no fatal crashes on state highway work areas happened for CDOT employees, contractors, or subcontractors.

C. Copy of the accident reporting form for each fatal accident

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Appendix B contains the accident reporting form for each of the 8 fatal accidents.

Crash summaries provided below are compiled from the Accident Report Form DR 2447 as filled in by the law enforcement officer and edited for readability. The actual reports are attached in Appendix B. Findings of investigations into each crash are made by CDOT personnel responsible for the construction area, supervisors, traffic engineers, safety officers, and other CDOT staff as applicable.

Crash 1

Date: February 20, 2013
Location: Eastbound US 36 west of 92nd Avenue / Sheridan Blvd.
Region: 1
Time: 02:49
CDOT Construction Project: Yes
Vehicles Involved: 2
Fatal CDOT employee, contractor, sub-contractor: None
Fatal Citizen: 1

Description of Event: Vehicle #1 was westbound in the eastbound right through lane US 36 and collided head-on into vehicle #2, which was eastbound US 36 in the right through lane. After the collision, vehicle # 1 rotated counter clockwise approximately 50 degrees and came to rest on its wheels facing a westerly direction in the right through lane of eastbound US 36. After the collision with vehicle #1, Vehicle #2 also rotated counter clockwise approximately 15 degrees coming to rest on its wheels facing a southeasterly direction in the right through lane of eastbound US 36.

Findings: The crash was not in the vicinity of any construction lane closures. A review of the overall project construction traffic control found no deficiencies that contributed to the crash.

Crash 2

Date: April 5, 2013
Location: State Highway 50 in Pueblo
Region: 2
Time: 00:55
CDOT Construction Project: Yes
Motorcycle Involved: Yes
Fatal CDOT employee, contractor, sub-contractor: None

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Fatal Citizen: 1

Description of Event: The pedestrian was under the influence of alcohol and elected to climb over a Type 7 Jersey barrier rather than going to the nearest intersection to cross the highway. Pedestrian was struck by motorcyclist.

Findings: The project traffic control signage was set up correctly and fines doubled signage was in place. This incident was unrelated to the construction zone, and no changes on future projects of this type are recommended at this time.

Crash 3

Date: April 14, 2013

Location: I-70 Mile Post 29

Region: 3

Time: 05:30

CDOT Construction Project: Yes

Vehicles Involved: 2

Fatal CDOT employee, contractor, sub-contractor: None

Fatal Citizen: 3

Description of Event: Vehicle #1 was traveling eastbound on I70 in the westbound lane. Vehicle #2 was pulling a trailer and traveling westbound on I70 in the westbound lane. At this location, the roadway is divided into one eastbound lane and one westbound lane and on an elevated structure. Vehicle # 1 and Vehicle #2 collided in the westbound lane of travel. Vehicle # 1 then rotated counter-clockwise for 52.1 feet before colliding with a concrete wall located on the south side of the elevated structure. Vehicle #1 then slide against the wall for 15.4 feet. The vehicle then rotated clockwise for 8.4 feet before coming to final rest on its wheels facing west. Vehicle #2 and trailer continued to travel in a southwest direction for 109.6 feet before colliding with the concrete wall located on the south side of the elevated structure. Vehicle #2 then traveled 10.1 feet along the wall before coming to final rest on its wheels facing southwest across both lanes of traffic.

Findings: No recommendations at this time. The crash was reviewed by Region 3 Regional Transportation Director, Regional Safety Officer and Traffic Engineer. The crash occurred on a CDOT Engineering Project during off work hours. The crash was between two (2) private citizen vehicles. The Project Method of Handling Traffic was followed as well as all Traffic Control requirements. Although the direct crash cause was not due to any project deficiencies Region 3 takes the crash very seriously and has taken steps to help ensure the safest project delivery on all region projects. Region 3 Director has communicated to Region 3 Engineering, Traffic & Materials staff that all future

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projects on four lane roadways will be reviewed for all possible methods to ensure that traffic detours involving two-way, head-to-head traffic is a last method of handling traffic. In the case when two-way traffic detours cannot be avoided Region 3 is researching methods of delineating (above and beyond striping) the center line in these areas. CDOT consulted with FHWA and Northwest Work Zone Roundtable (multiple-state peer exchange) and gathered other states approaches to separating traffic and have discussed those with engineers statewide.

Crash 4

Date: April 15, 2013

Location: Westbound US 36 at Mile point 48.76

Region: 1

Time: 04:39

CDOT Construction Project: Yes

Motorcycle/vehicle involved: 3

Fatal CDOT employee, contractor, sub-contractor: None

Fatal Citizen: 1

Description of Event: Vehicle #1 was westbound on Hwy 36 near Federal Blvd., when Colorado State Patrol trooper attempted to stop Vehicle #1. Vehicle #1 accelerated to high rate of speed and the Trooper discontinued his pursuit of the motorcycle. East of the Highway 128 overpass Vehicle #1 was in the left lane traveling at a high rate of speed where it rear ended Vehicle # 2 traveling in the lane ahead of it. The rider of Vehicle #1 was ejected and landed in the right traffic lane of west bound Highway 36. Vehicle #3 was traveling west bound in the right traffic lane and was unable to see the rider lying in the roadway and collided with the rider running him over. Vehicle #1 came to rest on its left side near the center concrete median divider with the front wheel towards the southeast. Vehicle #2 and Vehicle # 3 both came to a controlled stop after the crash. The operator of Vehicle #1 was transported to the hospital where he was pronounced dead on arrival. Vehicle #1 rear brake lever appeared to have been bent in a previous hit and run crash that occurred east of this crash location.

Findings: The crash was not in the vicinity of any construction lane closures. A review of the overall project construction traffic control found no deficiencies that contributed to the crash.

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Crash 5

Date: May 11, 2013
Location: 1300 Blk of Northbound North Federal Blvd
Region: 1
Time: 21:18 PM
CDOT Construction Project: Yes
Vehicles Involved: 1
Fatal CDOT employee, contractor, sub-contractor: None
Fatal Citizen: 1

Description of Event: Pedestrian was walking eastbound mid-block across the 1300 block of northbound north Federal Blvd and was struck by Traffic Unit # 2 who was traveling northbound in the 1300 block of North Federal Blvd in lane #2 at a stated speed of 30 MPH. As a result of the impact the pedestrian was carried by Traffic Unit #2 for a short distance before falling from the vehicle and skidding to an uncontrolled point of rest north of the area of impact.

Findings: All project related methods of handling traffic were in good order and traffic control devices followed the Manual on Uniform Traffic Control Devices (MUTCD).. The weather was typical for time of year no precipitation. Incident occurred at night, the pedestrian was crossing the street in dark clothing and limited lighting not in crosswalk per police report. No corrective measures to be taken.

Crash 6

Date: May 22, 2013
Location: I70 Eastbound Mile Post 127
Region: 3
Time: 0436
CDOT Construction Project: Yes
Vehicles Involved: 2
Fatal CDOT employee, contractor, sub-contractor: None
Fatal Citizen: 1

Description of Event: Colorado State Patrol responded to a crash involving a tractor trailer and a Mazda sedan. The crash occurred on Interstate 70, at Milepost 127 within the current construction zone. The construction zone consists of two way traffic in the westbound lanes. The tractor trailer was travelling westbound and had just exited a tunnel

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at Milepost 127. The Mazda was travelling eastbound when it abruptly moved from the eastbound lane and collided head on in an offset manner with the tractor trailer. After the impact the Mazda rotated counter clockwise at least once and came to rest in the westbound lane, facing east. The tractor trailer continued westbound and collided with the cement highway barrier off the south side of the roadway. The tractor trailer came to rest in the eastbound lane, facing west. The crash resulted in the death of the driver of the Mazda.

Findings: No recommendations at this time. The crash was reviewed by Region 3 RTD, RSO and Traffic Engineer. The crash occurred on a CDOT Engineering Project during off work hours. The crash was between two (2) private citizen vehicles and the At-fault vehicle causal factor was identified as "Lane Violation" of the Mazda by CSP. The Project Method of Handling Traffic was followed as well as all Traffic Control requirements. Although the direct crash cause was not due to any project deficiencies, Region 3 takes the crash very seriously and has taken steps to help ensure the safest project delivery on all region projects. Region 3 Director has communicated to Region 3 Engineering, Traffic & Materials staff that all future projects on four lane roadways will be reviewed for all possible methods to ensure that traffic detours involving two-way, head-to-head traffic is a last method of handling traffic. In the case when two-way traffic detours cannot be avoided Region 3 is researching methods of delineating (above and beyond striping) the center line in these areas.

Crash 7

Date: May 24, 2013

Location: I225 Southbound between Mississippi and Iliff

Region: 1

Time: 06:33

CDOT Construction Project: Yes

Vehicles Involved: 3

Fatal CDOT employee, contractor, sub-contractor: None

Fatal Citizen: 1

Description of Event: The vehicles were southbound on I-225 at approximately the 1700 block south (between Mississippi and Iliff). Vehicle #2 was in the #1 lane and vehicle #1 was behind vehicle #2. Vehicle #3 was in the # 3 lane. Vehicle #2 stopped abruptly for traffic. Vehicle #1 collided with vehicle #2. The operator of vehicle #1 was thrown into the path of vehicle #3.

Findings: There were no lane closures in place at the time of the crash. A review of the overall project construction traffic control found no deficiencies.

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Crash 8

Date: August 5, 2013
Location: State Highway 350 south of La Junta
Region: 2
Time: 19:45
CDOT Construction Project: Yes
Vehicles Involved: 1 Motorcycle
Fatal CDOT employee, contractor, sub-contractor: None
Fatal Citizen: 1

Description of Event: The motorcyclist was completing a pass and was re-entering the east bound lane when the motorcyclist lost control on uneven lanes. The motorcycle overturned several times; ejecting both the driver and passenger. The driver of the motorcycle died.

Findings: The incident occurred in the evening within a CDOT maintenance overlay project. Active work was not taking place at the time; however, the project was still in progress with one lane newly paved and the other yet to be done. There was an edge drop between the two lanes that was signed in accordance with the MUTCD and speed was reduced for this condition.

Crash 9

Date: August 14, 2013
Location: Highway 6 & 50 Exit 26 Westbound I70 off ramp
Region: 3
Time: 03:07
CDOT Construction Project: Yes
Vehicles Involved: 1
Fatal CDOT employee, contractor, sub-contractor: None
Fatal Citizen: 1

Description of Event: Private vehicle was traveling westbound on I-70. Vehicle got off at exit 26 and was driving westbound when it drove off the right side of the roadway. Vehicle drove into a dirt construction area and collided head on into a large caterpillar excavator which was parked in the construction area unattended.

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Findings: No recommendations. The crash was reviewed by Region 3 RTD, RSO and Traffic Engineer. The crash occurred on a CDOT Engineering Project during off work hours. The vehicle left the roadway and collided with the excavator that was parked out of the clear zone as required. All Traffic Control and Methods of Handling Traffic were followed and compliant.

Crash 10

Date: November 21, 2013
Location: I-25 South of Trinidad
Region: 2
Time: 06:35
CDOT Construction Project: Yes
Vehicles Involved: 1 Semi with two trailers
Fatal CDOT employee, contractor, sub-contractor: None
Fatal Citizen: 2

Description of Event: Vehicle #1 was travelling southbound on Colorado Interstate 25 in the right hand lane pulling two trailers, when the driver failed to negotiate a curve, causing vehicle #1 to travel across the left hand lane southbound lane and onto the center median colliding with a delineator post. The rear of the trailer of vehicle #1 then rolled 1/4 times onto its right side. The driver then overcorrected to the right, causing vehicle #1 to roll 1/4 times onto the driver side. Vehicle #1 then collided with second delineator post and slide across both southbound lanes of travel colliding with a guardrail on the west side of the road and continued to slide to final rest. Vehicle #1 came to final rest on the driver side facing northwest blocking both southbound lanes of travel. Both the driver and passenger died.

Findings: The project traffic control was set up properly with uneven lanes and grooved pavement signs. The uneven lanes were only approx. 200 feet in length going across a structure that had the asphalt removed and deck repair work. The rest of the project was paved back the same day as milled. The longitudinal taper was per specifications. While, the project was following specifications and standards, CDOT is reviewing its procedures for roto-milling and for allowing the presence of uneven lanes and under what conditions.

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Section 3. Work Zone Safety Program Update:

HB 10-1014 requests a description of both ongoing and newly implemented measures taken by CDOT to prevent fatal crashes in work zones. A description of CDOT's Work Zone Safety and Mobility (WZSM) Process Review and a cooperative effort between CDOT and CSP related to the development and implementation of a statewide work zone safety campaign is provided below.

A. Work Zone Safety and Mobility (WZSM) Process Review

In September 2004, the Federal Highway Administration (FHWA) published updates to the work zone regulations at 23 CFR 630 Subpart J referred to as the *Work Zone Safety and Mobility Rule* (WZSM Rule). In December 2007, FHWA added new regulations at 23 CFR 630 Subpart K referred to as the *Temporary Traffic Control Devices Rule*. Both are applicable to all Federal-Aid Highway Projects with the intent to improve work zone management and decrease the likelihood of fatalities and injuries to road users and workers exposed to motorized traffic. The Safety and Mobility Rule was effective on October 12, 2007 and the Subpart K was effective on December 4, 2008.

The WZSM Rule requires a process review at least every two years to assess the effectiveness and consistency of work zone safety and mobility policies and practices at the project level for both design and construction. The review also evaluated CDOT's processes and procedures as they relate to WZSM at both the program and project levels. A process review was completed in December of 2012.

Generally, the 2012 review revealed that the Regions recognize that while implementing WZSM procedures adds construction costs to projects, the procedures add safety value to work zones. The following recommendations from the 2012 review have been implemented:

- CDOT presently is working towards a standardized method of documenting and regulating traffic queues and/or delays, based on the WZSM Procedures, Sec 630.10 (3)(i) of the CDOT Standard Specifications for Road and bridge Construction, and the Regions' Lane Closure strategies.
- The WZSM Procedures should be updated to be consistent with the current specifications.
- CDOT's Chief Engineer internal memo on Work Zone Safety Guidelines was updated and presented to maintenance and engineering personnel.
- Updated Subpart J Procedures Document
- Updated Subpart K Procedures Document
- Revised Chief Engineer's Policy Memo 28 – Advanced Work Zone Management and Design
- Revised Chief Engineer's Policy Memo 29 – Safe and Effective Use of Law Enforcement.

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- CDOT is presently developing a traffic control work zone debriefing process.
- Revised the Law Enforcement memos for review and approval.

CDOT will again conduct a work zone safety and mobility process review with FHWA in 2014.

All of the above references are available online to CDOT personnel for use in designing and constructing projects, many of which can be found at the following public link.

<http://www.coloradodot.info/library/traffic/traffic-manuals-guidelines/lane-close-work-zone-safety>

B. Traffic Control Reviews

Annually, CDOT conducts inspections of construction work zones to score compliance with federal and state requirements, standards, and specifications. In 2013, six inspections were conducted in each of the six CDOT Regions. In each Region, the team attempted to review at least one nighttime operation, two CDOT Maintenance operations, and one full office review of a construction project, including traffic control documents.

The inspections consisted of a drive-thru of each project with information and comments recorded on a standard form. The office review included a review of project safety plan, the Method of Handling Traffic (MHT) and other traffic control related documentation. Following completion of the inspection and entry of data and comments, an overall percentage score was assigned to each project. The percent score was communicated to project or region personnel and was reported to FHWA in September of 2013. Project percentages were averaged to formulate a Region and Statewide average. Maintenance operations were scored similarly but are reported separately. The scores for the construction projects reviewed without prior notification are also reported separately below.

Results of the annual inspections form the basis for identifying needed changes and improvements to ensure continuous improvement in program results. Region staff will be expected to make changes as appropriate in the design process and in maintenance procedures, as well as in individual project management. Staff Branches will use the results to identify and support needed improvements in standards, specifications, procedures and training.

The goal for FY13 was a statewide average quality rating of 90%, with no individual projects rated below 85%. The average statewide quality rating for the 24 engineering projects was 93.5%. There were no construction projects of the 24 (18 with prior notification and 6 with

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no notification) reviewed that received a score below 85%. The statewide average of the 18 construction projects that received notification was 94.4%. The statewide average of the 6 construction projects that did not receive prior notification was 91.8%. The statewide average for the 12 maintenance activities was 93.3%.

C. Slow for the Cone Zone Campaign and Enforcement –

To increase awareness and improve construction work zone safety, every summer beginning in June and continuing through September, the Colorado Department of Transportation (CDOT) partners with the Colorado State Patrol (CSP) troop offices and other local law enforcement agencies to conduct the "Slow for the Cone Zone" campaign, which entails overtime enforcement on highly-visible construction projects across Colorado. This enforcement is provided to protect the workers from dangerous driving.

End of Report