Visual Fatigue: Lighting, Glare and Worker Performance Fatality File



Pedestrian Workers Struck and Killed in U.S. Work Zones

Summary of Incident Pattern

According to the Federal Highway Administration, 176 pedestrians — most of them roadway workers — were struck and killed inside U.S. work zones in 2023. The share of highway worker fatalities caused by a vehicle striking a worker rose from 35% in 2015 to 63% by 2021, with low-light conditions, sun glare, headlight glare, and operator visual fatigue repeatedly cited among the contributing factors. OSHA, NIOSH, and the Georgia Struck-By Alliance launched the National Safety Stand-Down to Prevent Struck-by Incidents during National Work Zone Awareness Week (April 15–19, 2024) to address this trend.

Investigation Findings (Pattern-Level)

NIOSH's 2024 Science Bulletin on internal traffic control plans and the FACE program's struck-by case files repeatedly identify the same contributing factors: dawn, dusk, and night-shift work performed without adequate task lighting; sun and headlight glare reducing driver detection of high-vis-clad workers; long shifts producing visual fatigue and slowed reaction time; and lack of positive separation between workers on foot and moving traffic. The FMCSA Large Truck Crash Causation Study links 13% of investigated truck crashes to driver fatigue — a category in which compromised vision is a primary mechanism.

Key Hazards Demonstrated by the Pattern

Visual fatigue rarely appears as the sole cause on a death certificate, but it is consistently present in the chain of events: the operator who did not see the worker, the worker who did not see the vehicle, the slipped step on the dim stair, the missed signal at the end of a long shift. Reducing glare, maintaining illumination to standard, and managing fatigue are direct controls.

Takeaways for the Toolbox Talk

Maintain lighting to standard in every work area and report failed fixtures

immediately. Control glare with shielded fixtures, anti-reflective screens, hat brims, and quality safety eyewear. Apply the 20-20-20 rule on screen-heavy work — every 20 minutes, look 20 feet away for 20 seconds. Manage fatigue with breaks, rotation, and honest reporting. Treat dawn, dusk, and night work as elevated-risk conditions and adjust pace, PPE, and traffic controls accordingly.

Sources: https://ops.fhwa.dot.gov