

Table 1: Solutions to Prevent Injuries at Road Construction Sites

Solution	Specific solutions
Increased visibility	<ul style="list-style-type: none"> Require workers to wear high-visibility safety apparel, including fluorescent, brightly colored, and reflective apparel, vests with strobes, and illumination rings for hard hats^{1a,1b,3} Employ work zone lighting, glare-free if possible^{1c,2} Increase taper length³ Install low-level transition lighting at the beginning and end of road work area to allow motorists to adjust to changing lighting conditions³ Increase visibility of barriers with bright colored paint, reflectors, and lights³ Ensure work signage is lighted and visible³
Positive barriers between workers and traffic	<ul style="list-style-type: none"> Use temporary longitudinal barriers, including concrete or movable^{1d,1e,3} Use other temporary traffic control devices such as traffic cones and barrels^{1f,3} Use truck-mounted attenuators^{1g}
Warning systems for drivers	<ul style="list-style-type: none"> Set up intrusion alarm systems³ Lay temporary rumble strips^{1h} Use warning lights² Portable changeable message signs, used in conjunction with traffic queue detection equipment, to provide drivers with real-time information^{2,3} Use dynamic speed display sign²
Warning systems for workers	<ul style="list-style-type: none"> Use sensors, handheld radios, and intrusion alarm systems³ Have an object detection and camera system for heavy equipment¹ⁱ Use self-adjusting and directional backup alarms^{1j}
Speed reduction systems	<ul style="list-style-type: none"> Enforce speed reduction with police presence and radar guns³ Ticket and fine violators³ Apply speed reductions incrementally to maintain uniform traffic flow³
Impact attenuators	<ul style="list-style-type: none"> Use crash cushions^{1k} Use truck-mounted attenuators^{1g}
Engineering controls	<ul style="list-style-type: none"> Use automated flagging assistant devices^{1l} Close the road, close the side of the road with work, or reroute traffic whenever possible³
Separate workers on foot from equipment	<ul style="list-style-type: none"> Use flexible colored poles or temporary pavement markings to delineate pedestrian-free areas within the work zone³ Train workers and equipment operators to communicate with hand signals³
Raise awareness	<ul style="list-style-type: none"> Participation in National Work Zone Awareness Week and Turning Point² Distribute site-specific safety materials to all visitors and employees in the activity area³ Ensure truck drivers and equipment operators are aware of internal traffic control plans³ Train all workers on the internal traffic control plan³ Hold daily toolbox meetings to discuss and report hazards, close-calls, and safety considerations for the day's tasks³
Equipment safety and rollover prevention	<ul style="list-style-type: none"> Use equipment with rollover protective structures and seat belts³ Only allow trained and authorized workers to handle equipment³ Require the use of parking brakes and chocks when equipment is unattended³ Install light strips on trucks for visibility, and use low-level lighting so that operators can see workers³ Regularly inspect and maintain equipment³ Use edge guards on trailers³