

IConstruction Hazard and Risk Control

Lecture Title: Vehicle and plant Movement

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Occupational Health and Safety**

Vehicle and plant Movement

This lecture covers the following learning objectives:

1. The hazards and control measures for the safe movement of vehicles/plant within a construction environment
2. Driving at work and the control measures to reduce work- related driving risks.
3. Management of vehicle movements.





OPERATORS!

4 Steps for Work Zone Safety

1. Before Operating, Check:

- Brakes (service, emergency, hand, etc.)
- Horn/back-up alarms
- Seat belts
- Steering mechanism
- Operating controls
- Tires
- Mirrors

2. Driving:

- Use mirrors
- Use back-up alarms
- Check blind spots
- Watch for workers near other equipment
- Obey signs and follow designated travel route



3. Backing:

- Restrict the area
- Follow flagger/spotter signals (verbal, hand, flags)
- Beep your horn twice or use a back-up alarm
- Use your mirrors and a spotter – know the signals
- Stop and recheck every 100 feet (at most)
- Stop if you lose sight of your spotter

4. Parking:

- Avoid backing out
- Keep windows open so you can see and hear people
- Pay attention – turn off radios
- Ensure the area is clear before moving – check blind spots

Safe movement of vehicles and plant within a construction site

Hazards in vehicle operations include:

- collisions between pedestrians and vehicles
- vehicles crushing feet of pedestrians
- people falling from vehicles
- people being struck by objects falling from or attached to vehicles
- people being struck by or ejected from an overturning vehicle
- communication problems between vehicle drivers and employees or members of the public

Safe movement of vehicles and plant within a construction site

Hazards in vehicle operations may be caused by:

- poor working practices, such as the lack of regular vehicular safety checks
- defective maintenance, steering, brakes, tyres and hydraulic hoses
- poor road surfaces and/or poorly drained road surfaces
- overloading of vehicles
- use of unsuitable vehicles to transport people
- inadequate supervision
- poor training or lack of refresher training



Other more general hazards involving pedestrians and vehicles include:

- reversing of vehicles, especially inside buildings; pedestrians are most likely to be injured on site by reversing vehicles;
- roadways too narrow with insufficient safe parking areas;
- roadways poorly marked out and inappropriate or unfamiliar signs used;
- too few pedestrian crossing points;
- the non-separation of pedestrians and vehicles;
- lack of barriers along roadways;



Other more general hazards involving pedestrians and vehicles include:

- lack of directional and other signs;
- poor visibility due to load impeding view, blind corners or inadequate vehicular lighting or mirrors;
- poor environmental factors, such as lighting, dust and noise;
- ill-defined speed limits and/or speed limits which are not enforced; and
- vehicles used by untrained and/or unauthorised personnel

Hazards from mobile work equipment

Accidents involving mobile work equipment often arise from one or more of the following events:

- poor maintenance with defective brakes, tyres and steering;
- poor visibility;
- operating on rough ground or steep gradients;
- carrying of passengers without the proper accommodation for them;
- people being ejected as the vehicle overturns and/or being crushed by it

Hazards from mobile work equipment

Accidents involving mobile work equipment often arise from one or more of the following events:

- being struck by a vehicle or an attachment;
- lack of driver training or experience;
- poor management procedures, training and supervision;
- collision with other vehicles;
- overloading of vehicles;
- general vehicle movements and parking;
- dangerous occurrences or other emergency incidents; and
- access and egress from the buildings.

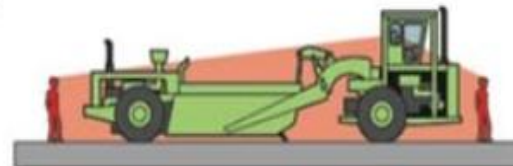


"BLIND SPOTS"

You may be able to see the operator but he may not be able to see you.



Dump truck



Tractor scraper



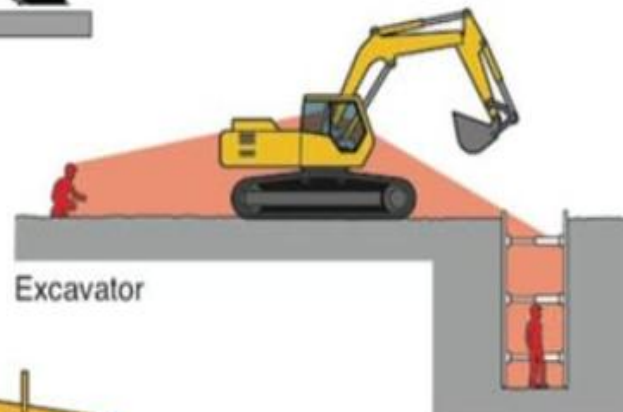
Bulldozer



Articulated roller



Articulated loader



Excavator



Control strategies for safe vehicle operations

- risk assessment
- designated marked traffic routes with good visibility and well-designed loading and storage areas
- enforced speed limits and/or the fitting of speed governors
- audible warning of approach signals, particularly for reversing
- separation of pedestrians and vehicles
- use of one-way systems
- the issue of suitable high visibility clothing and other personal protective equipment to drivers and pedestrians in vehicle operating areas

Control strategies for safe vehicle operations

- separate site access gates for pedestrians and vehicles
- use of pedestrian crossings on vehicular routes
- mirrors on blind corners
- identification of recognised parking and non-parking areas
- include vehicle safety in employee induction training
- driver training and refresher training given by competent persons
- the driver is responsible for the security of the load on a vehicle

Control strategies for safe vehicle operations

The provision of driver protection by the use of:

- seat belts
- FOPS (falling-object protective structures)
- ROPS or TOPS (roll- or tip-over protective structures)
- banksmen during reversing operations

effective vehicular maintenance procedures use of daily vehicular inspection checklists to include emergency systems, engine oil level and hydraulic fluid level environmental considerations (road surfaces, gradients and changes in road level, lighting, visibility)

The management of vehicle movements involves:

- a designated management system and a code of practice for all drivers, who must be competent
- an effective line management organisation to ensure supervision of all vehicular activities
- a documented preventative maintenance programme with all work recorded
- regular inspections and, in some cases, thorough examinations by competent persons
- ensuring that all vehicles are fitted with suitable driver protection – seat belts, ROPS
- ensuring that all vehicles are fitted with reversing warning systems
- suitable fire precautions, particularly in battery charging areas

Hazards and controls of vehicles on construction sites

Common construction vehicles:

- site dumper trucks
- fork-lift trucks with telescopic handlers
- all-terrain and rough terrain vehicles
- Excavators
- tipper lorries
- various types of earth moving equipment



Hazards and controls of vehicles on construction sites

Main hazards:

- overturning;
- collision with structures on the site, pedestrians or other site vehicles;
- non-segregation of pedestrians and vehicles;
- uneven road surfaces;
- inclines which are too steep;
- falling materials;
- noise;
- dust;
- poor maintenance





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Key controls are:

- provision of safe vehicular routes – clear routes should be set out across the site. These routes should avoid sharp bends, blind corners (unless suitably placed mirrors are located at the corner), narrow gaps, low head room and adverse cambers or steep gradients;
- road surfaces inspected and maintained regularly;
- the use of one-way systems;
- introduction and enforcement of speed limits;
- adequate lighting at road junctions;
- separate entrances and exits to the site with adequate turning room

Key controls are:

- the use of clear signs;
- prevention of falls into excavations by the erection of strong barriers;
- separation of pedestrians and vehicles;
- the safety of members of the public must be considered, particularly where vehicles cross public footpaths;
- restriction of the carriage of people on site;
- loading and storage areas need to be well designed;
- only properly trained drivers allowed to drive vehicles



Key controls are:

- banksmen should be used to direct lorries and excavators;
- rollover and falling-object protection;
- driver restraint systems;
- good maintenance of vehicles (and daily checks);
- vehicles fitted with flashing beacons or reversing alarms;
- vehicles must not be overloaded; and
- vehicles must be sheeted when loaded



Driving at work

- A risk assessment should be undertaken to cover all aspects of driving at work. This should include the use of alternative means of transport other than driving.



Factors affecting occupational road risks

- The Driver

competency issues including:

1. validity of the driving licence
2. awareness of the company policy on work-related road safety
3. general driving experience
4. health and fitness, in particular eyesight
5. level of training receive



Factors affecting occupational road risks

- The Vehicle
 1. its suitability;
 2. its condition, particularly seat belts and head restraints;
 3. its past maintenance schedule;
 4. the ergonomics of the driving position;
 5. any load should be stacked safely so that it cannot move during the journey. There must also be satisfactory arrangements for handling the load at either end of the journey;
 6. the vehicle breakdown procedure

Factors affecting occupational road risks

- The Journey

1. route to be undertaken, including the amount of traffic, the time of day when the journey is made and the sufficiency of the time allowed for its completion;
2. the type of roads being used, whether motorway, minor roads or those involving city centre congestion, and their condition;
3. schedules need to take sufficient account of busy periods on roads;
4. driving excessive distances without appropriate breaks; and
5. adverse weather conditions, such as snow, ice, heavy rain and high winds



Managing occupational road risks

- An effective policy to manage occupational road risk should address important and relevant aspects of the Highway Code, the possible enforcement action by the authorities and the following issues



Managing occupational road risks

For the driver:

1. all drivers must have a current and valid driving licence;
2. details of a prospective driver's previous driving experience should be examined and recorded;
3. driver training and health;
4. regular eyesight tests;
5. staff should not drive, or undertake other duties, while taking a course of medicine that might impair their judgement;



Managing occupational road risks

- For the driver:
 6. some prescribed and over-the-counter drugs and medicines can affect driver awareness and speed of reaction. Drivers using such medicines must check with a doctor or pharmacist to ensure that it is safe to drive;
 7. ensure that drivers have necessary communication equipment (mobile phones, GPS, personal alarms);
 8. encourage drivers to regularly report back to colleagues in the base office;



Managing occupational road risks

9. the monitoring of driver performance;
10. the number of recorded incidents;
11. all speed limits must be observed;
12. the determination and recording of driving hours;
13. outline driver safety checks such as those on lights, tyres and wheel fixings;
14. drivers and passengers are adequately protected in the event of an incident. Crash helmets and protective clothing for those who ride motorcycles and other two-wheeled vehicles should be of the appropriate colour and standard;
15. drivers of Heavy Goods Vehicles (HGVs) must have the appropriate driving licence and medical certificate; and
16. disciplinary action taken in the event of non-compliance with the agreed in-house rules and standards.



Managing occupational road risks

- For the vehicle
 1. all vehicles must carry comprehensive insurance for use at work;
 2. all vehicles should be fit for purpose;
 3. new or replacement vehicles should be suitable for both driving and the health and safety of the public;
 4. all vehicles should be regularly serviced and maintained – particularly important when pool cars are used, because pool car users often assume another user is checking on maintenance and the MOT



Managing occupational road risks

- For the vehicle
 5. the safety critical systems (brakes, steering and tyres) need to be properly maintained;
 6. if the vehicle is leased and serviced by the leasing company, a system should be in place to confirm that servicing is being done to a reasonable standard;
 7. each vehicle should have a handbook available for the driver;
 8. there should be a defect reporting system for drivers to use if they consider their vehicle is unsafe; and
 9. if privately owned vehicles are used for work, they should be insured for business use and, if necessary, have an appropriate MOT certificate test



Managing occupational road risks

For journey planning

1. journey times must include statutory breaks and allow for possible delays;
2. motorways are the safest roads – minor roads are suitable for cars, but are less safe and could present difficulties for larger vehicles;
3. overhead restrictions, for example bridges, tunnels and other hazards such as level crossings, may present dangers for long and/or high vehicles;
4. sufficient consideration will need to be given to adverse weather conditions; and
5. no alcohol or recreational drugs must be consumed during the day of the journey until the journey is completed. Only minimal amounts of alcohol should be consumed on the day before a journey is to be made



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