**MOSH Traffic Management Leading Practice for Open Pit/Cast Operations in South Africa**

**A Traffic Management Plan must include:**

1. **Risk Analysis**

 6 Step Transport at work Hazard Risk Assessment :-

* Identify the risks posed by transport activities
* Identify who might be harmed
* Evaluate the risks
* Record the assessment
* Identify/Reassess control measures to eliminate/reduce risk
* Review and update the assessment regularly or when a change or incident takes place.
1. **Mine Site Design/Pre Planning Design**

The plan should identify traffic routes and traffic flow, access points, parking areas and other traffic control areas. Particular attention should be paid to the following site areas:-

* Access to the site and security controls.
* Traffic routes, parking areas, delivery points
* Distribution Point
	+ Processing areas
	+ Weighbridge location
	+ Sheeting and Tipping areas
* Site offices and amenity areas
* Workshop layouts and designs
* Environmental control issues and requirements.
* Operational Designs for
	+ Haul Roads
	+ Plant Parking areas
	+ Tips and Excavations
	+ Lagoon Systems
	+ Coal Stocking,
	+ Sheeting Areas, Tip
* Stand –offs
	+ Utilities
	+ Water ways
	+ Transport infrastructure
	+ Public roads and footpaths
* Consideration should also be given to traffic routes in working and operational areas which change as the site work progresses.
1. **Parking area design**

 When designing car parks the following should be considered:

* Sufficient parking spaces to allow for employees, staff, site visitors and contractors.
* Traffic routes e.g. one way systems.
* Reverse parking policy.
* Suitable traffic calming measures.
* Pedestrian routes.
* Lighting and disabled access
* Consideration should be given to issuing the visiting drivers with a plan so that their movements and operations are strictly controlled.
1. **Pedestrian movement**
* Traffic routes should be planned to give the safest route between places where plant, vehicles and pedestrians have to call, park or operate.
* Pedestrian routes should be planned to minimize exposure of the pedestrians to vehicle movements by the installation of barriers, crossing points etc.
* “no entry” zones should be identified and clearly marked by signs, fencing, cones etc. Employees must not enter operational areas as a pedestrian unless authorised to do so.
* pedestrian routes or zones should be established and desig- nated with suitable signs, barriers, road markings etc. particularly where plant is operating or manoeuvring.
1. **Contractor/ Delivery vechile movement**
* Contractor haulage vehicle operators should comply with any site specific rules applicable.
* Contractor haulage vehicle operators should not be allowed to proceed into the working area until they have received appropriate permission and instruction in any relevant local rules. Site Managers will ensure that local procedures are implemented to ensure that drivers are made aware of site rules.
* The local rules and site traffic management plan will outline procedures and designate loading and unloading areas, trimming off areas, tipping areas, sheeting areas, tailgate securing areas and safe places for vehicle inspections.
* Operators of Contractor haulage vehicles should remain in the cab during loading operations and at all other times within the loading area. If for whatever reason a driver of an external haulage wagon leaves the cab the loading shovel operator should place the bucket on the ground and ensure the shovel remains stationary until the wagon driver returns to a safe place/cab.
* Drivers should ensure that their load is fully discharged.Tipping bodies must be lowered as soon as possible after tipping to prevent the risk of overturning.
* Site traffic management plans will specify areas where Contract haulage drivers are
* permitted to get out of their vehicle. No pedestrians are permitted within 30 metres of an operational loading shovel unless there is a suitable physical barrier to protect the pedestrian from vehicle movements.
* Contractor haulage drivers should ensure that all lights, directional indicators and reverse warning indicators are working at all times when on site.
* In the event of a breakdown or an emergency involving a contractor haulage vehicle the driver should remain in his cab unless it is not safe to do so and follow the local procedures for stranded vehicles by contacting a supervisor or weighbridge operator in the first instance. The use of mobile phones will only be permitted in an emergency.
1. **Customer/visitor movement**
* All customer/visitor vehicles should report to a designated control point to sign in, to receive site rules and site induction as necessary and to receive instructions regarding points of delivery and who to report to.
* The site rules should include traffic routes to be taken, parking arrangements, pedestrian control and the need to observe signs and instructions in relation to traffic control and segregation, where applicable.
* At the point of delivery the receipt of the goods will be controlled by a designated person who will ensure that parking and unloading rules are observed.
* Site specific rules should be prepared to cover the delivery of gas oil, explosives and other hazardous materials.
* After unloading the delivery vehicle should return to the designated control point to sign out.
* Plant delivered to site should be escorted to the designated off loading or build area away from other plant movements. The areas should be suitable for all relevant works such as cranes etc.
1. **Traffic Management Rules**
	1. **Loading rules**
* During normal loading operations, when the excavator operator is satisfied that a truck is positioned safely to receive a load he will discharge the load from the bucket.
* On completion of the load and when the excavator operator is satisfied the truck is safely loaded the excavator horn or other suitable indicating device will be used to in form the truck driver to move off.
* On sites where local authority planning permissions restrict the use of horns on nightshift the Site Manager must authorise a safe system of work for communication between excavators and dump trucks, for example signaling using lights to indicate that the truck is safely loaded.
* Dump trucks should approach the loading zone in an orderly fashion and should only manoeuvre into position when it is safe to do so.
* Whilst loading is underway no vehicles should be parked within the loading zone other than for the purpose of being loaded.
* When a dump truck has been loaded it must leave the loading zone and proceed to the tipping area without delay. Excavator operators must check the truck has left the loading zone before making any manoeuvre that would cause collision with the loaded truck should it not move off for any reason. If the truck cannot move off immediately the truck driver must communicate with the excavator operator.
	1. **Dumping rules**
* Suitable edge protection berms with a minimum height equal to1.5 m of the radius of the largest vehicle wheel, whichever is greater, must be maintained at drop edges.
* Berms and stand-offs should be designed or considered by the Geotechnical Specialist to ensure stability and allow for the maximum rear axle weights and dynamic loading.
* Tip edge berms must be maintained at all times to a suitable profile as illustrated below.



* Dozers and other vehicles in the tipping area must remain in the view of the operator of a reversing vehicle at all times i.e. on the cab side. Dozers and dump trucks must remain at least one truck width apart from other vehicles while on tip edges. Dump truck operators must never drive within the reversing path of a dozer.
* On no account should a vehicle be reversed blindly in a tipping area. Operators must make full use of visibility aids and should not reverse until they are certain that the path is clear and only if a stand-off or protection is in place adjacent to any edge or hazard.



* Where possible the dozer should work with a tipped load between the dump truck to ensure a physical control measure is in place to maintain a safe distance. Do not enter the dozers reversing path.
* On no account should a dozer operator leave a tip edge unless a suitable edge protection berm is in place.
* If due to a breakdown or other unforeseen circumstances the dozer operator is unable to form a suitable edge protection berm, the operator must inform a supervisor immediately.
* Dump truck operators must ensure that an orderly sequence of tipping is followed at all times giving due attention to other vehicles in the tipping area.
* On approach to the tipping area the dump truck must be positioned so that it can reverse safely taking account of other vehicles in the vicinity.
* Dump trucks must be reversed safely in the tipping area and approach the tip edge at a decreasing speed. The dump truck must be manoeuvred to allow it to stop at right angles adjacent to the tip edge berm.
* Operators must make full use of all visibility aids and other reversing aids throughout this operation to monitor the position of the rear wheels in relation to the tip edge berm.
* Loads should only be discharged at a tip edge when a suitable edge berm is in position.
* On no account should a vehicle be allowed to mount a tip edge berm or the load tipped directly over the tip edge
	1. **Road rules**
* All vehicles driven within the site should use dipped headlights at all times.
* Ensure that the area around the vehicle is clear before moving away or altering direction. Where reasonably practicable, large vehicles must never be turned using full steering lock from a parked position. Any area where the vehicle may manoeuvre must first be checked and must be clear. Where necessary the driver must exit the cab to check that the area is clear before moving off.
* Drive with due care and attention and at a speed that is appropriate to the prevailing ground, weather and visibility conditions.
* Obey local speed limits where applicable.
* A safe distance must be maintained from the vehicle in front so that emergency action can be taken. As a practical rule, vehicles must maintain a minimum of 3 large truck lengths (approx. 30 metres) away from the vehicle in front and further in poor conditions. Particular care should be taken on haul roads that have been newly sprayed with water for dust suppression purposes.
* Vehicles will normally be driven on the lefthand side of the road unless specific instructions are issued or local rules implemented to the contrary.
* Loaded vehicles always have priority over empty vehicles.
* Light vehicles must always give way to heavy vehicles and not enter heavy vehicle areas without permission from supervisors. A safe distance must always be kept from heavy vehicles.
* Light vehicles should not travel along areas of reduced visibility on the off sides of dump trucks without advance communication with the dump truck operator.
* When vehicles of similar size and capacity are sharing a haul road and there is a need to give way, the vehicle travelling uphill has priority.
* Vehicle operators must give way to traffic coming from the right at junctions.
* Only trucks for loading or tipping purposes may enter the swing radius of an excavator or manoeuvering zone of a dozer or loading shovel.
* Pedestrians and other vehicles must not enter the area unless granted permission by the Supervisor or other designated person and the plant is stationary with the bucket, blade, ripper or other raised equipment grounded.
	1. **Breakdown and recovery rules**
* Consideration to the immediate safety of the operator and the vehicle shall be given prior to the subsequent recovery operation.
* A risk assessment should be carried out by a competent person and consider the following:-
	+ - The position of the stranded vehicle should be considered with regard to other traffic movements and site hazards.
		- Slopes and gradients
		- Blind Corners
		- Brows of hills
		- High walls
		- Tight areas
		- Tipping operations
		- Excavations and haul roads
		- Stability
1. Layout of Road Systems (Routes)
	1. Mine access route(s)
	2. Site Routes
	3. Benches and Haul Roads
	4. Zoning
	5. Intersections/Alignment
	6. Road Maintenance, repair and expansion
2. Road Design
	1. Gradient and Slopes
	2. Drainage
	3. Capacity
	4. Surface stability
	5. Intersections/alignment
	6. Edge protection
	7. Rock Traps
	8. Berms
3. Visibility
	1. Pedestrians
	2. LDVs
	3. HVs
	4. Lighting
	5. Dust suppression
	6. Traffic Signage
4. Traffic Supervision
5. Control of unplanned events
6. Communication