Yellow Iron vs everything

How others are working to reduce the chances of pedestrian and vehicle collisions
Training and Experience

- Let’s not discount the need for constant training, retraining, and experience while operating equipment/vehicles.
- Nothing can remove the skill and responsibility of the operators and drivers from the equation.
- Even high tech systems can be over-ridden by an idiot.
- Can you do everything here? No
- Can you afford everything here? No
- Will it all work for you at your operation? No
- Is it foolproof, idiot-proof, and completely undefeatable? No
Throw some Tech at it

- **Hi-Tech**
  - Cameras, Proximity systems, Geo-Fencing

- **Medium Tech**
  - Radios, Barriers/gates, lights

- **Low Tech**
  - People, gear, signs
High Tech
Remove at least one pedestrian
Back Up camera
Use of in cab cameras (not just back up cameras)
988H Color Camera/Flat Screen View on Left: View out of back cab window on Right
Use of Sonar, IR or other prox detection

- RADAR
- LIDAR
- Ultrasound
- IR
Use Both

- “When we went to cameras w/ sonar the backing incidents/collisions pretty much stopped.”
CAT 988H Loader equipped with rear vision camera, rear detection sensor (Precor) and Dual Strobes.
The whole shebang!

1. Backup Camera
2. Side Cameras
3. Rear View Monitor
4. Dash Camera
5. Backup Sensors
6. Blind Spot Sensors
7. Mobile DVR
8. Driver Fatigue System
9. 360° Surround View Camera System
Collision Warning/Avoidance

- **Collision Warning**: devices that sound an alarm or light, to warn of high risk situation
  - Personal car, tailgate beep
  - GPS/Geo-fencing

- **Collision Avoidance**: system that actually takes control of equipment.
  - Electromagnetic
  - RFID
Once at the bottom of the haul road, switch radio channel to "UHF CH10."

- Trucks must give way to heavy vehicles.

- Ask for the control room.

The control room operator will either ask you to come to the bin sets, (straight ahead) or to bin 10, (to the right) where you will see a stop sign.

Wait at the stop sign for the loader operators instructions.
Proximity Detection for Vehicles
Proximity Detectors for Pedestrians

- RFID
- Radar
- Electromagnets
Medium Tech
Remote Operation
Radio/Communicate

- Make sure there is excellent radio communication. Every operator should have radios and use them.

- “Our plants that use these have NO issues. They are very diligent about communicating when a vehicle is entering areas where heavy equipment works. This is a cultural thing that must be worked on, but it is very effective and low cost.”
Station/Route signs
Improve traffic patterns

- Lights, markers, signage to designate hazards and risks
- Widen roads/benches/work areas
- Remove blind corners
- One way traffic
- Designated areas
Better Ground Control

- Barriers and gates
Blind spots and tight turns
Whip Flags/Light sticks
LED lighting
Delineation
Low Tech
Better Ground Control

- Clearly marked areas of operation, for pedestrians, vehicles, repair trucks/lube, and Iron
- Delineated paths, working areas, etc.
- Better/easier signage
- Delineated/separated parking and pathways
  - Don’t park/walk near the big iron.
A place for everything...
More/Bigger Mirrors
More Windows
Vehicle ID

- Every vehicle (HME and light Vehicles) have a clear number visible from every angle –
- Then every radio communication begins on protocol of each vehicle positively identifying themselves prior to any task or direction – intended to eliminate (or at least reduce) confusion on who is talking to whom.
Hi Vis Reflectors
Mechanic Safety

- Portable signs to warn of workers
- Magnetic, for use on parked vehicles/barrier
Hi Vis for Pedestrians
Spotters/Directors

- Use of visible/dedicated spotters for helping equipment get into and out of tight areas
- Use of Traffic Directors for same