



**XXIV<sup>th</sup> WORLD  
ROAD CONGRESS**  
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# Improvements in Safe Working on Roads

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**C1.4 SAFER ROAD INFRASTRUCTURE**



# Acceptable Work Place?



# Acceptable Work Place?



# Work Zone Safety Issues

- Road traffic crashes kill 1.2 M people annually
- Specific safety issues in work zones unclear
  - ARROWS: “increase in accident risk vary from a few to several hundred percent”
- Adequate transportation is vital to all economies



# Work Zone Safety Solutions: Many Roles

- Politicians: take an active interest in road safety
- Road authorities: develop and use safety standards
- Designers: consider safety issues in roadway plans



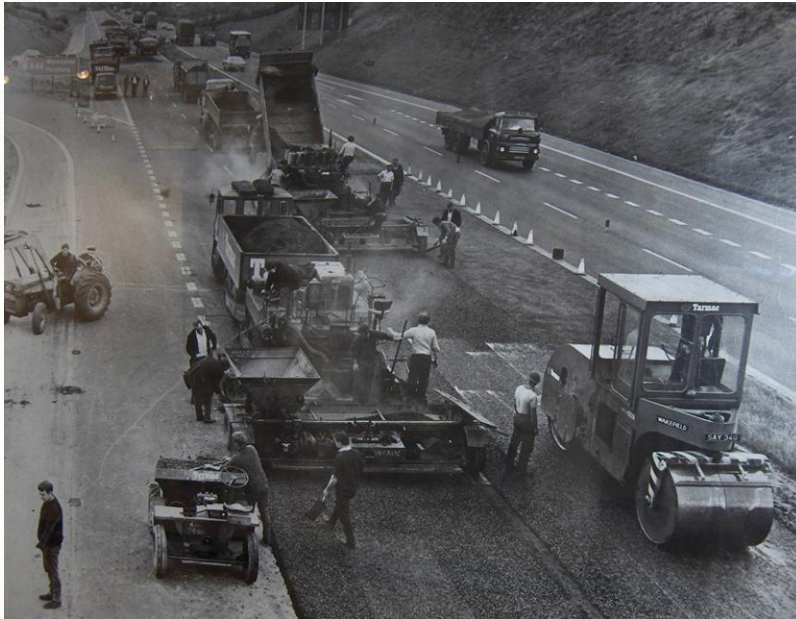
# Work Zone Safety Solutions: Many Roles



- Contractors: train personnel adequately
- Workers: actively follow safety procedures
- Drivers: behave responsibly
- Police: actively participate



# Work Zone Safety; What's the Problem?



The 'good old days'



# Work Zone Safety: What's the Problem?



The 'bad new days'





# Principles of Safe Work Zone Management

- **Conspicuous** - Is the approaching work zone obvious, noticeable and eye-catching?
- **Clear** – Does the driver know what to do? How fast? What lane? Are the signs and lane markings correct? Does the driver have **all** the necessary information?
- **Consistent** – Does the work zone look and feel like others the driver has encountered in the past?
- **Credible** – Does the driver receive any conflicting information? Does the driver believe that speed reductions are necessary?



# Conspicuous?

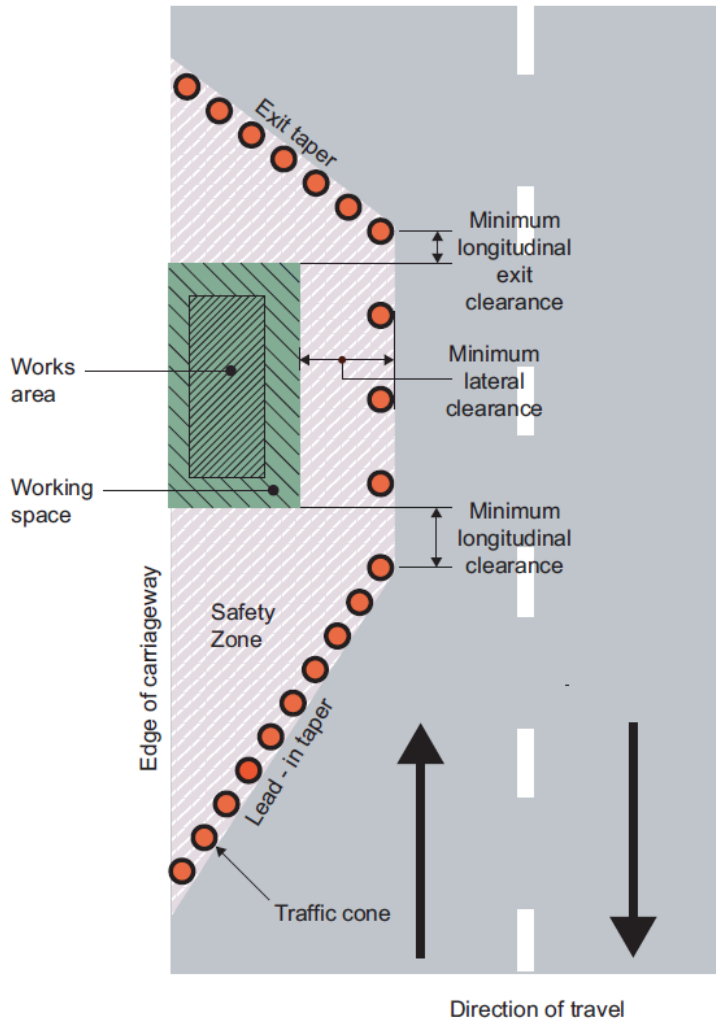


# Clear?



# Consistent?

- Lead in Taper
- Works area
- Exit Taper



# Credible?



# Planning and Design of Work Zones

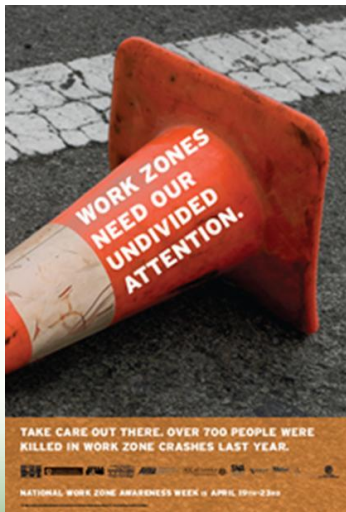
- Provide safety for road users and workers
- Minimize delay to road users
- Provide clear and positive guidance



# Planning and Design of Work Zones

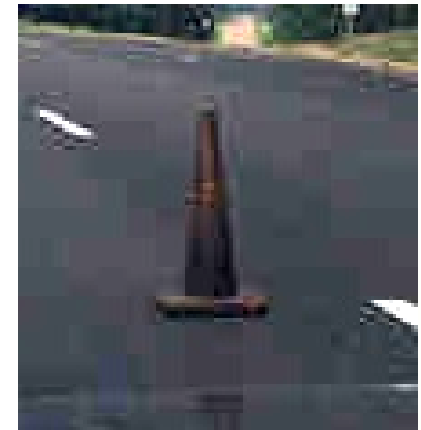


- Maintain roadside safety
- Train planners and decision makers
- Mount a public relations campaign



# Operations and Signing

- Worker safety
- Traveler safety
- Safety equipment
  - Mobile road equipment
  - Signs – types, sizes, supports
  - Delineation – markings, land separators, cones and posts,



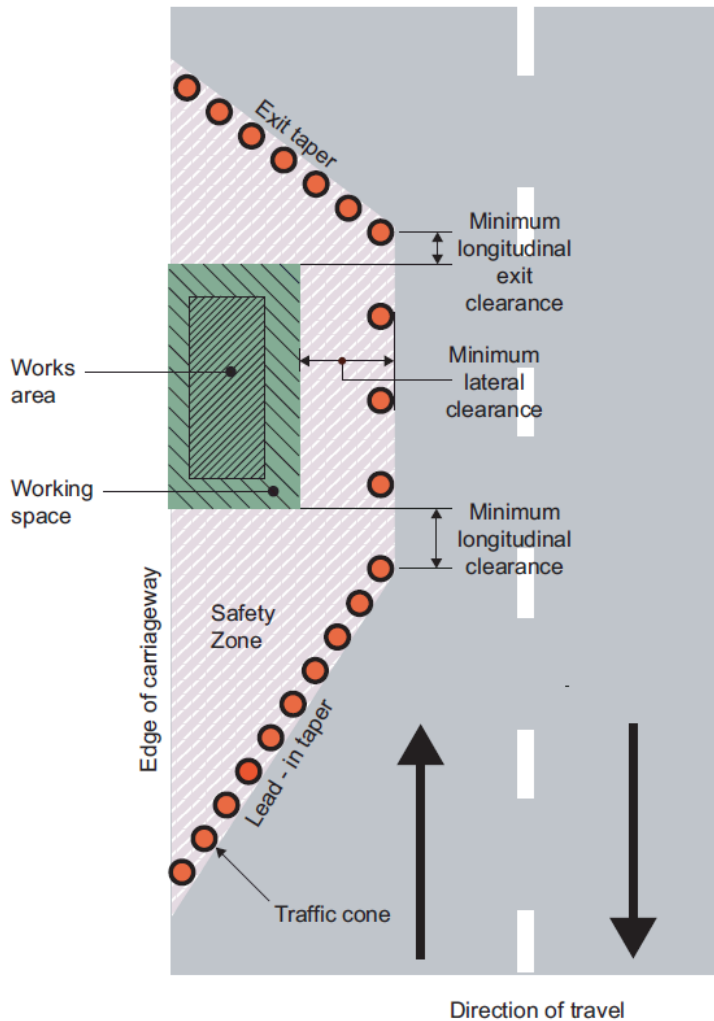


# Personnel Issues

- Occupational safety issues
  - Fitness for work
  - Personal protective equipment
- Roadway safety
  - Training and behavior
  - Work zone layouts
  - High visibility clothing



# Basic Work Zone Layout



- **Lead in Taper**
  - Speed determines length
  - Safety zone – keep clear of machinery and vehicles
  - Cones, posts or positive separation
- **Works area**
  - Maintain safe distance from vehicles
- **Exit Taper**
  - Drivers resume normal operations

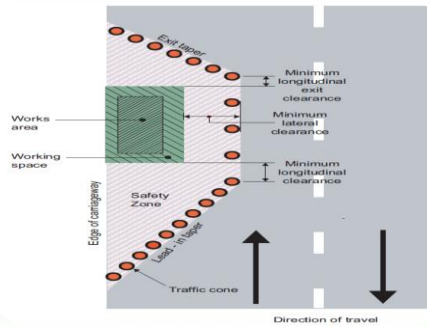




Conspicuous



Clear



Consistent



Credible



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