Briefing Note

Road Worker Conspicuity

High visibility clothing is used widely by road workers (and other industries), and also by many leisure users. In most cases the wearer believes there will be an improvement in their safety, as approaching drivers may detect them earlier and so be able to take any necessary avoiding action sooner.

High-visibility clothing contains two elements which may help drivers achieve this earlier view: fluorescent material (which aids daytime conspicuity) and retro-reflective material (for night time conspicuity). It is commonly accepted that a single item of clothing must combine both types to give optimum results.

Combinations of fluorescent and retro-reflective material for professional use in PPE are detailed in BS EN 471:2003 (High-visibility warning clothing for professional use — Test methods and requirements). The HA requires workers on its high speed roads to wear high visibility clothing to BS EN471 Class 3.

The Highways Agency wished to establish whether current best practice standards for PPE are adequate to ensure road worker conspicuity under night time and daytime conditions. TRL carried out research focused on the following research questions:

1. What are the perceptions and opinions of road workers with regard to their conspicuity?
2. At what distances are road workers seen in a naturalistic but controlled track study under daytime and lit/unlit night time conditions?
3. Do different colours of PPE vary in their visibility under daytime and lit/unlit night time conditions?
4. Are there differences between subjective ratings of visibility for different coloured materials (representing PPE) against different background colours (representing works vehicles)?
5. What are the expectancies of drivers regarding the likelihood of encountering road workers in the proximity of vehicles stopped at the side of the road with flashing lights or beacons?

The research included consultation with Traffic Officers, road workers, emergency services and recovery workers, track studies during night time and daytime conditions (during which participants were driven past one of two scenarios

mocked-up on the TRL track) a study in which participants rated the subjective visibility of difference combinations of PPE material and background colours and a post-drive interview in which participants were asked about their expectancies on encountering vehicles with flashing lights and beacons in their everyday driving.

Summary

The main recommendation from the research is that the biggest benefit will be obtained from raising road worker and driver awareness of conspicuity issues, in particular that Traffic Officers and other road workers need to understand:

- The distances at which it is likely they are being detected by drivers who are not specifically searching for them
- How conspicuous they really are, particularly within their working environment
- The difficulties that approaching drivers may have identifying workers who are in close proximity to works vehicles, particularly those marked with high-visibility colour schemes or displaying warning beacons

Also, drivers need to understand:

- The likelihood of road workers being present
- Their relative lack of conspicuity, especially at night, even when wearing high visibility PPE
- "Yellow lights = people"

Further recommendations for action included improving conspicuity of the TOS uniform by incorporation of retro-reflective material to the ankle area and, ideally, by the use of fluorescent yellow trousers.

No particular PPE/vehicle colour combination to was found to have a significant advantage in improving conspicuity, although there may be some specific situations in which the combination of orange PPE and white vehicles, or yellow PPE against orange vehicles (e.g. for the HA salting vehicle fleet), are beneficial to road worker safety The combination of white vehicles and orange PPE may be easiest to see, but the combination of yellow PPE against white vehicles could lead to 'blending' and reduce road worker conspicuity