

# London Urban White Paper

Improving the Standards of Construction  
Site Establishment Citywide





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## About the Author

Keith Smith has over 30 years' experience in the Traffic Management and Highways sectors, including many years as a Civil Engineer, both in the UK and in the Middle East. This includes several years working in highway maintenance, motorway communications and technology.

Keith is a Chartered Engineer and Fellow of both the Chartered Institution of Highways and Transportation and the Institute of Highway Engineers, a Member of the Institution of Engineering and Technology, and a Technician Member of IOSH. He was also the first UK registered Temporary Traffic Management Engineer.

Over the years, he has led and still participates in many working groups within the Traffic Management industry, and as an accomplished technical writer has significantly contributed to many documents on traffic best practice over the last 15 years. This, along with the work he has been involved with in developing 'mobile carriageway closures' in a contractor provider role, has provided the industry with several emerging new practices, which reduce risks and improve industry performance, all of which are increasingly becoming the industry norm.



He is an advocate for developing traffic management skills across the UK, and created and ran the first professional engineer course for designers and engineers in collaboration with Aston CPD and the Institute of Highway Engineers. He also developed and introduced the first TSCO course; the first Gate Person course; and the Sign Design course for LANTRA and the traffic management community.

He is currently employed as Chief Engineer by the Chevron Group, a position he has held for over 5 years.

***“Our highways are the corridors delivering our future economic and digital prosperity. Those persons and organisations undertaking road and street works need to improve their approach to support active travel, avoid conflict with road users and avoid harm to economic growth and urban mobility.”***



# Introduction

When travelling throughout London's urban areas, it is highly apparent that the site establishment arrangements currently in operation to control the movement of traffic and Non-Motorised Users (NMUs) around live construction sites – which includes site containment, access restrictions, signage and traffic management – are not fit for purpose.

There are many urban construction sites in operation that pose a significant risk to stakeholders due to the selection of materials and the design – this comprises physical and psychological risks to health, safety and wellbeing, promoting crime and disorder, and undermining the high-quality 'place making' experience that is a growing expectation within modern capital city street scape environments. This affects peoples' ability and willingness to access local businesses and services, harming localism and impacting some of the most vulnerable in our communities.

The risk level increases significantly during peak hours, when the roads and pavements of the capital are operating at full capacity, and during the hours of darkness, when reduced visibility and dark areas disconnected from other traffic or people reduces the feeling of being safe and secure (these feelings being key to urban environment use and wellness). The consistently high levels of construction activity and constant redevelopment activity within the capital, alongside the delivery of major infrastructure projects, make this a significant and recurrent issue.

Current legislation and regulations in this area are inadequate, inconsistent and decades-old and the underpinning prescriptive approach used by the industry has not evolved with the modal shifts or changing social needs of urban London in recent years.

The lack of guidance or a uniform design code encompassing the accessibility needs of all users also means that there are no intuitive solutions to providing a high level of technical compliance. This results in a wide variety of systems being produced, which leads to many contractors prioritising cost over suitability, selecting the cheapest option available and reverting to traditional methods such as pedestrian barriers, Heras fencing and timber hoarding.

These issues also have a wider relevance outside of London and can currently be observed in any major city throughout the UK.

The construction industry and its supply chain have a responsibility and a duty of care to protect the health, safety and wellbeing of all those affected by works and to support equality, diversity and inclusion.

Action must be taken to address these site establishment issues; for example, working collaboratively with key stakeholders such as Transport for London (TfL), the Considerate Contractors Scheme and others to ensure equity and that the needs of all stakeholders are fully accommodated and addressed.

***“Everyone has a legal right to pass and repass along highways without obstruction. Whilst vital, road and street works must consider the impact on all users' active needs and ensure that barriers and hazards to movement are removed by improving their performance and approach.”***



# The Impacts – Who is Affected and How?

## Health, Safety and Wellbeing

Current measures fail to provide adequate protection for those affected by works, due to poorly designed systems, poor maintenance and use of unsuitable equipment.

## Scaffold-Related Hazards

Poorly designed and/or protected scaffold structures that lack stability pose a risk of collapsing onto the carriageway and pavement, which has the potential to cause a catastrophic event leading to a significant number of casualties and deaths.

Scaffold structures are also highly susceptible to vehicle collisions and acts of terrorism.

Objects protruding into the walkway, such as unprotected scaffold tube ends, pose a risk of injury to pedestrians. Narrow walkways between gantries that are inaccessible for buggies, wheelchairs and mobility scooters force pedestrians out onto the carriageway in order to pass, exposing them to the risk of traffic collisions.

Vertical safety risks are also an issue with the potential of objects falling from height onto the footpath or road. 135 workers were killed in work-related accidents in 2022/23 (RIDDOR). 45 of those deaths were related to construction workers, which represented the largest proportion at 33%. 68 members of the public were killed in work-related accidents during the same period (1).



## Vehicle Incursions

Poorly designed traffic management systems, including inadequate or inappropriate signage strategies, generate an increased risk of driver confusion, which results in traffic accidents, collisions with cyclists and vehicle incursions, with the potential to cause severe injury and/or death to the travelling public, NMUs and construction operatives alike.

The deployment of equipment that has been adapted for use beyond its original purpose also fails to offer NMUs adequate segregation and protection from live traffic.

## Slips, Trips and Falls

Slips, trips and falls account for the majority of accidents across all environments. The inconsiderate deployment of equipment around construction sites and the presence of redundant construction equipment and signage littering the pavement significantly increase the risk of slips, trips and falls occurring.

For example, Heras fencing is frequently erected with no hi visibility rail and the rubber block fencing feet protruding out onto the pavement, creating a dangerous trip hazard. These issues pose a significant risk to vulnerable NMUs, such as visually impaired individuals who are less able to identify the risk.

## Psychological Stress

Motorists and NMUs who are faced with repeatedly having to navigate their way past a multitude of construction sites as part of their daily commute, each with a differing layout and appearance, may experience undue psychological stress, which could lead to a negative impact on their wellbeing and safety.





## Equity – Barriers to Access

As part of a fully inclusive society, all stakeholders must be given equal consideration and their needs must be accommodated as far as practically achievable, minimising barriers to access. Every journey matters and should be treated with the same importance as general health and safety and work delivery, and accommodated within the solution provided. The needs of pedestrians and cyclists (NMUs) should be treated with the same level, or even a greater priority, as the powered traffic using the road network, due to their inherent vulnerability in this busy environment. Providing a designated space that allows free and safe passage for all is key.

Examples of categories of NMUs who are frequently impacted by poorly designed and maintained temporary site arrangements include less able pedestrians using mobility equipment and parents with buggies, who may require additional clearance between barriers and objects as well as ramps to negotiate kerbs and changing levels in pavements. Visually impaired individuals also face challenges in navigating site establishment, including obstructions, undefined borders, poor lighting levels and transparent panels, all of which can cause confusion and trip hazards, as well as permanent street side infrastructure such as tactile paving.



The needs of neurodiverse individuals should also be considered in the design of site establishment. For example, individuals with autism may experience distress and disorientation if they come into contact with black or very brightly coloured hoarding around construction sites. Those with dyslexia may experience confusion due to poorly designed or executed signage strategies that favour the use of words over universally recognised symbols, which would also benefit London's multi-national demographic.



Cyclists are exposed to an elevated level of risk from unsuitable temporary barriers that are unstable and liable to collapse, forcing them to swerve into the carriageway to pass. Furthermore, barriers that are not highly visible and have sharp edges or protruding components pose an increased risk of collision and physical injury.

The need to accommodate cyclists will become increasingly significant as Net Zero targets, the Mayor's Vision for Cycling and the London Cycling Campaign drive the capital to become a cycling city.

***“Less is often more. A less cluttered, intuitive site is usually a more compliant and better performing temporary system.”***



## **Criminal Activity and Nuisance Behaviour**

Each year approximately 4,000 crimes take place at construction sites, 80% of which involve theft of plant and materials, and the final 20% including acts of violence and sexual offences (2). Section 17 of the Crime and Disorder Act 1998 places an obligation and duty to consider crime and disorder in all undertakings, including the design of temporary works.

The inconsiderate design of access restriction measures around construction sites also has the potential to promote crime within the area, as it reduces visibility through obstruction and inadequate lighting and restricts CCTV coverage.

Examples include enclosed and unlit gantries through scaffold structures, hanging walls, recesses in hoarding lines and traditional timber hoarding that has been painted in very dark colours, providing minimal light reflection.

Obscured from view, these areas create a significant risk of criminal activity, such as street robbery, drug dealing and drug use, and antisocial behaviour including graffiti, littering and urinating or defecating in public.

Existing lightweight plastic pedestrian barriers lack structural stability and are vulnerable to antisocial behaviour, as they can easily be pushed over and then become a hazard in their own right and a barrier to movement.

Furthermore, the 'Broken Windows Theory' of criminology suggests that visible signs of disorder and neglect – such as graffiti – can encourage further crime, including acts of vandalism and antisocial behaviour in an area, as they signal a lack of order and law enforcement.

The psychological impacts of these issues can also create a barrier to access for people who are afraid of becoming a victim of crime, or who find movement stressful or physically challenging, and may prevent them from passing through an area, using local services, or in the most extreme scenarios, from leaving their home.

People in vulnerable categories are more likely to be impacted. The Crime Survey for England and Wales (March 2019) found that almost 1 in 4 (23.1%) of less able adults aged 16 years and over experienced crime, compared with 1 in 5 (20.7%) of non-disabled adults (2).

Existing solutions also offer minimal protection against intentional acts of aggression and violence that are more likely to be perpetrated in a capital city (such as acts of terrorism).

## **Weather Resistance**

The barrier products and systems that are currently in use around many of the construction sites in London typically lack structural strength and are frequently deployed in a manner that is not compliant, competent or uniform, affecting resilience to adverse weather conditions such as high winds and users falling against them.

Consequently, they are susceptible to falling over and can be easily displaced, creating a hazard for vehicles and cyclists on the carriageway, for pedestrians on the pavement and a barrier to access. This lack of stability creates an increased requirement for maintenance visits by qualified personnel to confirm that the barriers are upright and are positioned according to the approved design. Simple design changes can resolve this.

The need for frequent maintenance visits generates increased carbon emissions, which has a detrimental effect on the environmental performance of construction projects and on the air quality at a local level, in addition to increased costs.

## **Public Perception**

In a modern capital city there should be an emphasis on place making to improve urban vitality and promote individuals' health, happiness and wellbeing, alongside localisation.

Place making is about creating an environment where users feel welcomed, safe and confident. It is frequently applied to the construction project that the traffic management is enabling but rarely applied as a design approach to road works, creating a place rather than an engineered solution.

The current provisions offer little in the way of aesthetic appeal to support this objective, and in some cases have a detrimental effect, causing litter to accumulate and creating unpleasant areas with poor hygiene. They also offer little in the way of brand protection to the project or scheme and frequently look unsightly, creating a negative perception of the end client.

This is often exacerbated by degradation following the initial installation, caused and accompanied by a lack of maintenance and proactive management, which in some circumstances borders on abandonment.



# Why do These Issues Occur?

## Inadequate Standards

The current standards that are in operation are not fit for purpose and fail to adequately address the challenges that are present in urban construction environments in London 2024 and are a barrier to mobility and economic growth.

The Safety at Street Works and Road Works: A Code of Practice (commonly referred to as The Red Book) published by the Department for Transport (DfT) provides minimum requirements and a point of reference (3).

The primary intention of The Red Book is to help contractors to safely carry out signage, lighting and guarding of less complex street works and road works by making sure that all street and road works are safe for both construction operatives and the general public.

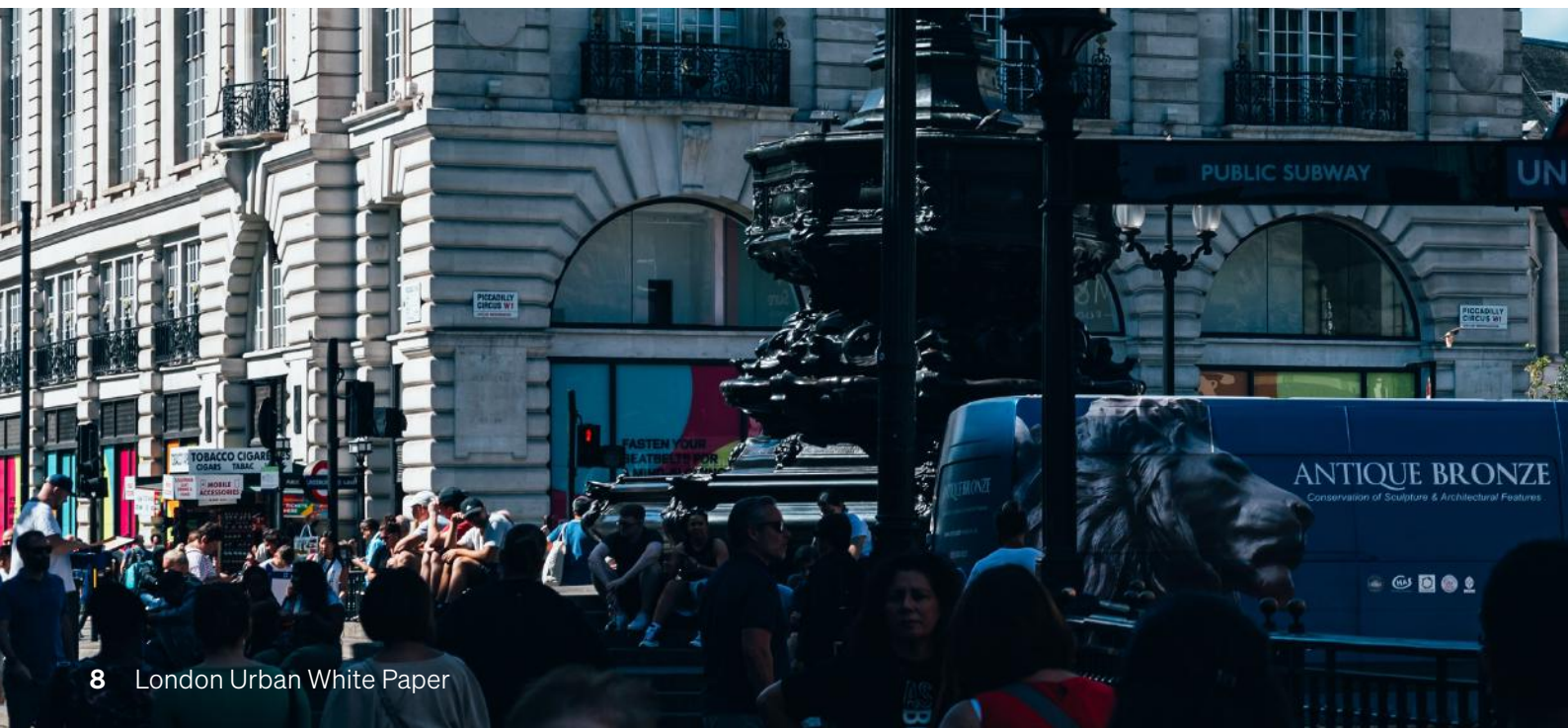
It states that road users, including pedestrians, equestrians and cyclists, should not be put at risk and should be able to see the extent and nature of any obstruction well before they reach it, paying particular attention to the needs of vulnerable groups, including people with disabilities, the elderly, children and those with buggies, to allow them to pass by the hazard.

Originally published in 1991 and last updated in 2013, The Red Book does not currently address many of the challenges surrounding urban construction sites in London in 2023, particularly those that occupy footways with temporary structures, and nor does it address the issue of deliveries to those sites.

For example, there is no reference to significant scaffolding structures in The Red Book relating to or how to deal with roadside risk or complex scaffolds that are now a regular feature of urban conurbations.

The Traffic Signs Regulations and General Directions 2016 standard for hoarding assumes a dark colour, along with a white band to support visibility (4). This long-standing requirement of the legislation fails to consider neurodiverse individuals who may find black or bright hoarding disorientating, or the desire of organisations for brand developments.

Many of the existing standards have been designed and considered in isolation and do not consider the interfaces between the elements that make up traffic management systems and associated risks. All elements that make up road and street works systems need to come together by design to create an integrated solution and a better user experience with no barriers to movement.







For example, current scaffold design codes do not consider the risks of working next to a live carriageway or the associated risk of incursion, which could potentially result in a temporary works structural collapse. The standards also rarely consider the potential harm from materials used to build the structures on road users. There is an opportunity to revise the current standards and codes of practice to incorporate more specific detail and consistent information about the safe management of urban construction sites, to improve standards and achieve their original objectives.

### Limited Enforcement

While it is evident that the current standards can create a solution that is technically fit for purpose – especially for pedestrians – it is apparent that many construction companies do not understand the significance of the measures that are being designed and they then compound the poor level of service that their design provides by failing to ensure that those measures are diligently maintained and operated.

The Highways Act 1980 and the New Roads and Streetworks Act (NRSWA) 1991 place the responsibility on the relevant authority to authorise and inspect the provision of works on their network. The authority has the ability to issue fines and other enforcement action, but this is a lengthy process that has significant administrative costs.

Most authorities issue different guidance documents and codes for road works with a varying range of requirements, often based on local thinking, giving an inconsistent approach between authorities, a

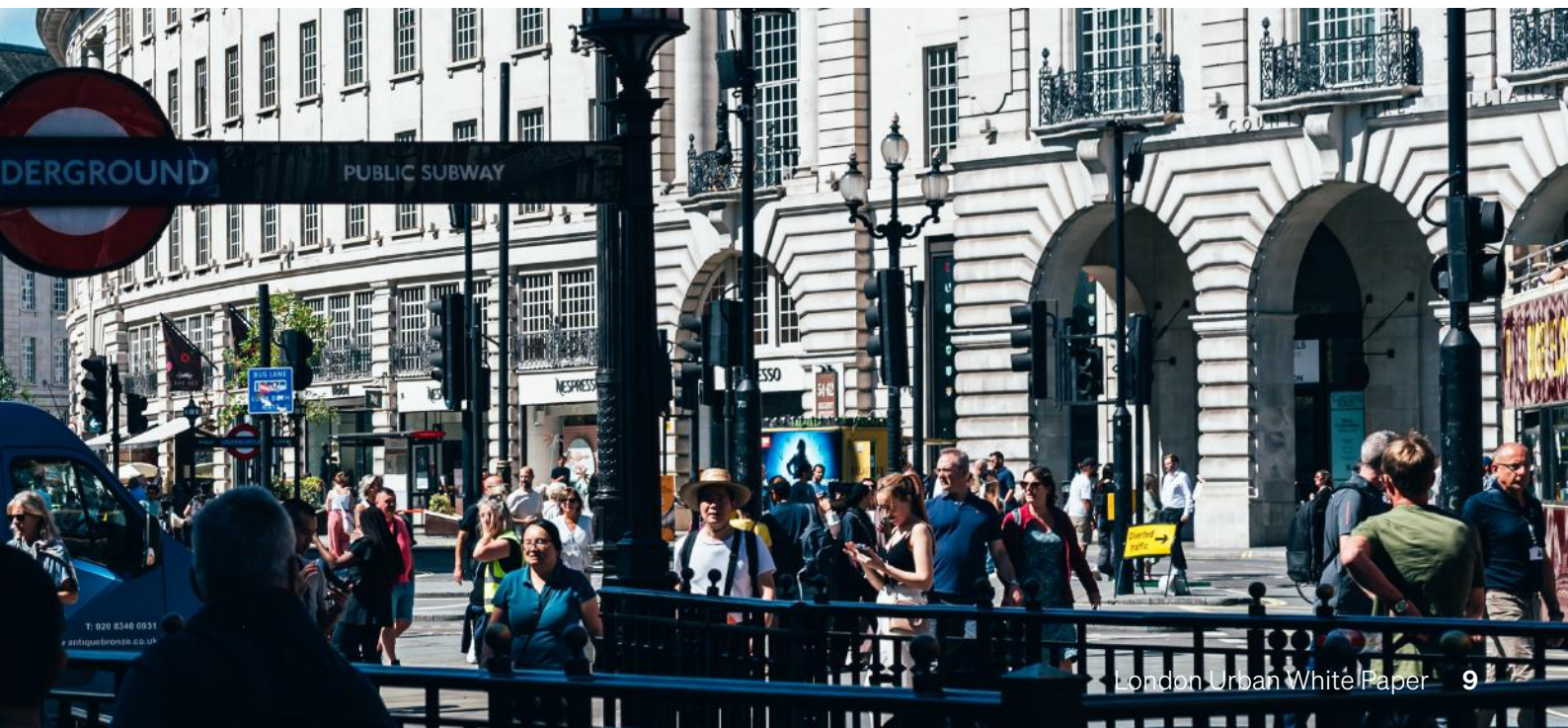
situation that in itself is a major non-compliance with the relevant codes as it creates differing local approaches which have to be interpreted by national travellers.

Road works in the south should be the same as in the north, as local variations give rise to misinterpretation and hesitation.

This may be the result of ignorance or a deliberate act due to the knowledge that there is very limited enforcement of standards currently in operation to provide an active deterrent and significant area variation.

Not only should there be a consistent approach across all local authorities, but a balance must be struck between the needs of contractors to deliver work and the need of a road user to use the highway. Failure to do so results in a workplace that is unsafe, instils a lack of confidence in the road user and makes them feel their needs have not been properly considered by the contractor.

As required by the Codes of Practice, when designing and specifying works it is essential that the road user clearly understands what is expected of them and is able to pass safely through the works. Pure compliance with the pictorial images in a code is insufficient to prove actual compliance. Codes provide one means of achieving compliance. When using a risk-based approach, if the contractor was to follow the fundamentals that underpin the code for a different layout or system that was likely to result in improved performance and increased highway (road user) understanding, then this can be implemented so long as the requirement for uniformity is met.





# Improvement to Current Standards – What Can be Done Now?

## Improved Design

Therefore, there is an opportunity to design works in line with current standards, whilst providing better solutions to improve urban mobility alongside promoting active travel initiatives. For example, see Figure 1, below.

The needs of pedestrians and cyclists should be placed above the needs of vehicles as they are inherently more vulnerable. This reflects the approach taken in recent road traffic legislation.

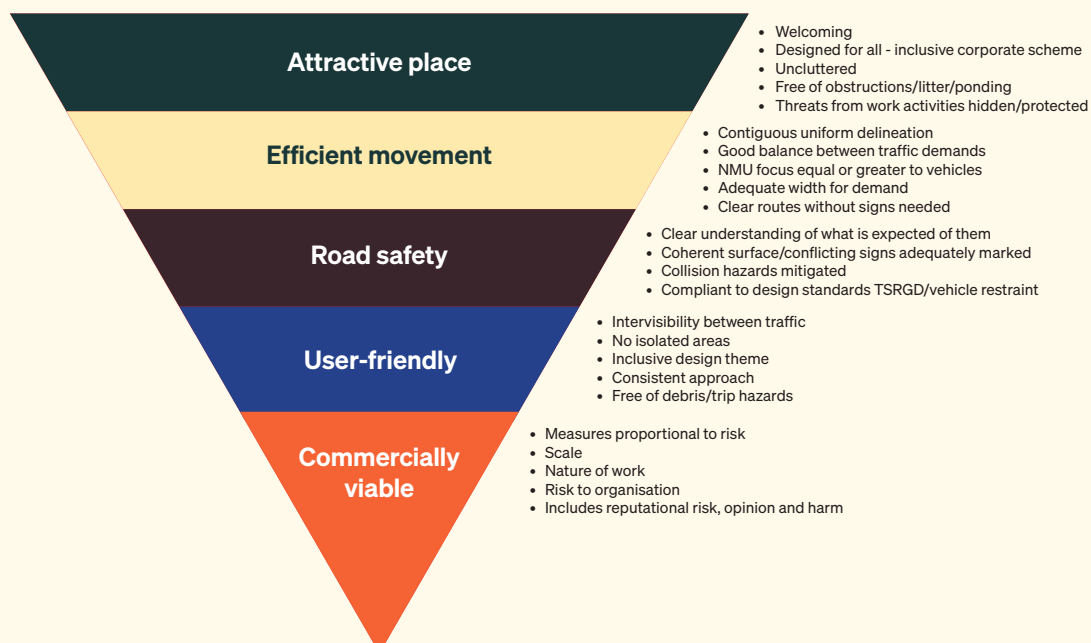
By adopting a place making mentality, permanent design principles can be translated to a temporary setting; for example, by giving due consideration to layout, visibility, security and aesthetic aspects to create a place that conforms and is welcoming.

For example, an underpass is a conforming design and is much safer for pedestrians, when road vehicles are considered in isolation, but they are typically disliked by pedestrians as they are not welcoming and the detachment from other traffic in the isolated underpass creates a feeling of insecurity.

Contractors should keep in mind that removing active travel corridors, cycle tracks and bus provisions should not be the first means of creating space for the worksite, and they must ensure that when these measures are removed accessible provision is made on a user's desired route. It is also essential that any temporary provision must have the same level of accessibility design as the original location.

Place making in a temporary setting can be achieved by engaging with professional organisations such as the Chartered Institution of Highways and Transportation (CIHT)'s Urban Design Panel, who are concerned with the interactions and influences between transport, traffic and street design at a local level (5).

Figure 1 - The Design Hierachy





## Pedestrian Barriers

The lightweight plastic pedestrian barriers that are typically deployed around construction sites are often seen lying on their side, having been blown over by heavy winds during periods of adverse weather or deliberately displaced as a result of nuisance behaviour (image A).

This not only limits their effectiveness as a means of access restriction between the public and live construction works, but it also creates a trip hazard and barrier to access for NMUs and a collision hazard for road users, in addition to creating a perception of a lack of consideration of others during site works.

The use of a heavy-duty pedestrian barrier system, such as the one pictured in image B, that cannot be pushed over or be blown over by the wind will help to prevent this issue.

These systems allow for robust interlinking of barrier units with a coupling arrangement design. This reduces the working width in comparison with traditional construction fencing and enables more space to be provided for pedestrians and cyclists to safely pass the worksite.

There are no weights or feet protruding out from the base, as commonly seen, eliminating the trip hazard.

## Vehicle Restraint Systems

Red and white water-filled barriers can often be seen deployed in the carriageway around construction sites across London, as a means of vehicle restraint. However, these products do not provide adequate protection against the risk of vehicle incursions and collisions (image C).

Furthermore, in the majority of cases they are not filled with water as per their intended use, which further diminishes their effectiveness as a safety barrier. Use of an appropriate temporary vehicle restraint system, that is specifically designed to fulfil that purpose, will help to greatly reduce the risk of vehicle incursions and collisions.

The example in image D is a concrete barrier solution with a steel frame and which is therefore highly robust. The barrier has a short layout length and does not need to be anchored to the ground.

This barrier system can also be used in conjunction with accessories, such as a mounted panel and mesh, to enhance security and acoustic properties.





## Pit Lanes

The use of pit lanes is a relatively new development within construction sites across the London urban environment.

Pit lanes are not currently covered within The Red Book and consequently there are no defined standards to provide guidance and direction for contractors or to govern their design and implementation.

Contractors typically use a combination of products that are designed for other uses to create hybrid pit lane solutions, leading to widescale variations and pit lanes that are not fit for purpose.

The selection and deployment of suitable products that are fit for purpose, including vehicle restraint systems and gated barriers, can be used to create an effective pit lane solution.

One such solution is the provision of a pit lane that provides adequate segregation between traffic, eliminates opportunities to enter the pit lane in error, provides clear delineation of the lateral obstruction, and mitigates the possibility of anything in the pit lane falling into the carriageway, as represented in the image below.



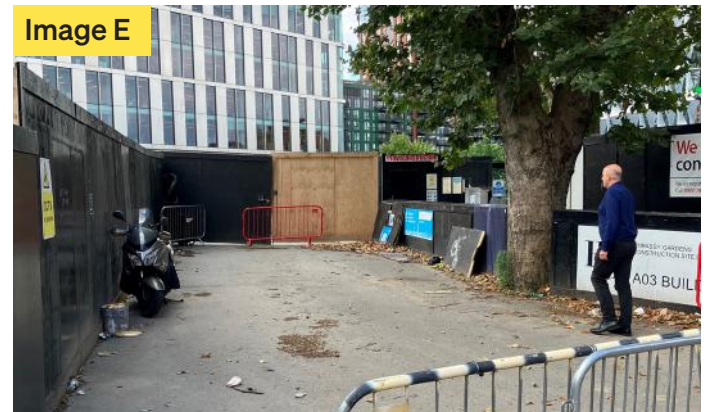
## Site Hoarding

Poor design of site hoarding can create numerous issues. Recesses in the line of the hoarding, such as the abandoned site entrance in image E, provide opportunities for criminal activity and nuisance behaviour, including street mugging and drug dealing. Recesses in site hoarding also cause litter to congregate, negatively impacting hygiene and public perception.

Dark-coloured site hoarding can also affect visibility at night due to low reflectivity and can also cause confusion and distress for neurodiverse individuals. A greater level of consideration when designing and installing site hoarding has the potential to eliminate these issues by removing and/or reducing unnecessary recesses or creating flat hoarding lines that provide a continuous line of sight.

Adopting lighter, neurodiverse-friendly colours, such as pastel shades of blue and green, helps to reduce stress and improve visibility and security.

The solution is to move from ad hoc wood structures to a defined well-engineered site using proprietary products to a design code.



## Improving Awareness of Requirements

The provision of training and development activity and targeted communication campaigns can help to raise awareness of the aforementioned issues relating to urban mobility.

Various organisations, including TfL, provide customised training for Site Marshalls to make them aware of key site establishment considerations and to demonstrate good practice.





# Future Development and Aspirations

## Improvements to Legislation and Operational Standards

The current aspiration is that central government and local authorities serving the London urban environment will improve upon the current legislation and accepted industry operational standards to make them fit for purpose; for example, by the DfT issuing a specification to update the standards within The Red Book.

Improvements to legislation and industry operational standards that also make greater allowance for place making – for example, by bringing the concepts of permanent design into temporary solutions – are also desirable.

Strengthening the consequences of non-conformance to these standards will provide greater potential for reinforcement, improving the likelihood that sites will be designed, installed and maintained to a high standard and in full compliance.

## Development of Enhanced Product Solutions for the UK Market

Changes to legislation and industry operational standards will drive the design, development and availability of better products for the UK market, which would offer all-encompassing solutions to improve safety, reduce crime, maintain accessibility and contribute to place making. This includes both the development of individual products, designed to be used in isolation, and the design and testing of product solutions that are intended to perform a specific function, along with an effective and compliant system with a clear catalogue of parts that are simple to construct.

Products should be fully inclusive, promote accessibility and movement, and provide safety and security for all users. They should be well presented and aesthetically pleasing to convey confidence in their use and contribute to effective place making.

***“The scale of road works required to deliver the UK’s digitally connected and low carbon future has the potential to disrupt London’s transport strategy for 80% of all journeys to be active travel by 2041. We need to change how we think about road and street works.”***



## Case Study – Exposed Excavation

M&S Water Services (Utilities) Ltd was excavating a footpath on Devon Road, Luton, to access a stop tap that needed replacing. The stop tap could not be reached by hand and so it was left protected by plastic barriers until a deep dig team could attend a few days later.

Luton Crown Court heard that on 28th May 2017, over a bank holiday weekend, a member of the public, Matthew Wilmot, was walking home when he fell into the excavation site. His body was found the next morning.

A Health and Safety Executive (HSE) investigation found that suitable and sufficient risk assessment had not been completed. It should have identified the need for secure fencing, backfilling or covering as the excavation was to be left unattended for 5 days and there was no easy alternative route for nearby householders.

M&S Water Services (Utilities) Ltd of High Town Enterprise Centre in York Street, Luton, were found guilty of breaching Section 3(1) of the Health and Safety at Work Act (6).

**HSE Inspector Alison Ashworth said after the hearing:**

**“This tragic incident could have been avoided had the risks been properly assessed and simple precautions put in place.”**



# Conclusion

If this issue is not addressed, there is an increasing risk of serious accidents and incidents occurring within urban London, including road traffic accidents, construction-related accidents, robberies, assaults and acts of terrorism, all of which can potentially result in minor injuries, major life-changing injuries and/or death.

The wider implication is a negative perception of urban London as an unsafe city, affecting the capital's reputation and standing on a global stage, as well as its economic growth, levels of tourism and selection as a host for major national and international events.

In addition to the obvious consequences for the injured parties, other key stakeholders will also experience negative impacts. Potential consequences for local authorities, construction companies and their employees include damage to public perception, claims for damages, legislative action, prosecution, and fines where they are found to be liable.

It is essential that construction companies and members of the supply chain work together with central government and local authorities to enhance public safety and security by driving improvement into the current design standards; for example, the establishment of a uniform design code would lead to intuitive solutions.

This design code must be backed by practical and affordable product solutions that create an effective barrier between live traffic, NMUs and live construction activities, whilst promoting security and improving urban vitality.

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