

# Read about our Armadillos featuring in the London Cycle Design Guide

Armadillos appear in the TFL London Cycling Design Standards for guidance on the design of coherent, high quality cycle lanes and tracks on links, on and off-highway.

The London Cycling Design Standards sets out requirements and guidance for the design of cycle-friendly streets and spaces. It should be used by all those who shape the street environment through planning and street design, as well as engineers designing cycle-specific infrastructure. It forms one part of TfL's Streetscape Toolkit, and should be read in conjunction with the other constituent documents, including the Streetscape Guidance.





Light segregation with posts in Minneapolis



Use of concrete 'lacasitos' in Seville

#### 4.3.4 Light segregation

Light segregation refers to the use of physical objects intermittently placed alongside a cycle lane marking to give additional protection from motorised traffic. While there are many international examples, there is little established practice in the UK. On-street monitored trials are needed to help in ascertaining the benefits and risks of different products and types, and to clarify certain design requirements.

In effect, light segregated lanes are a variant of mandatory cycle lanes, offering some of the benefits of continuous separation in terms of feeling of safety. In all cases, it is important to follow guidance on recommended widths (see section 4.4) as cycle safety and comfort cannot readily be improved if motor traffic is passing a narrow cycle lane with little clearance.

Interim results from off-street trials show that, in comparison to lane markings only, users felt safer when light segregation was placed next to the marking. Cyclists stay further from lower separating objects but are more comfortable riding nearer to moving motor vehicles where they are separated by high objects such as flexible posts. This is an important consideration for the effective width of the cycle lane, and the potential for overtaking within the lane.

#### Light segregating objects

Types of light segregation that may be considered include:

- Pre-formed separators made out of rubber, recycled plastic or concrete, including small humped separators: these are placed inside (not on top of) mandatory cycle lane markings, and are easy to install and cheap to replace
- Planters, narrow versions of which are available and can help to delineate cycle routes; they present some risk of causing an obstruction at a turning point, and installing them also has maintenance implications
- Flexible posts, which provide a strong visual indicator of separation of space, and even come with illuminated tops; however, they can look temporary and diminish the attractiveness of a street; where used in the carriageway, flexible posts must have at least 60 per cent of their surface covered in retro-reflective material

Whatever object is used for light segregation, it should not resemble an existing road marking or obstruct a road marking in a way that might make it unidentifiable.



Pre-formed separators used next to cycle lane markings (note that only one lane marking should be used)



Flexible posts used for a temporary buffer to a cycle lane



Planter and pre-formed separators

Light segregating objects will need maintaining and, very often, will need replacing when damaged. In all cases, it is important to follow manufacturers' instructions on installation, particularly with regard to fixing to the carriageway surface, to ensure the product performs as it should and does not fail when struck. It is also important to ensure that a safe maintaining strip can be provided to support the safety of maintenance operatives when repairing or replacing objects in the carriageway.

### Design considerations

The considerations set out in figure 4.7 for kerbed separation generally also apply to light segregation, for example:

- Any use of objects in the carriageway should be done in a way that does not compromise accessibility for any person with a mobility impairment; gaps and step-free access needs to be provided at formal and informal crossings
- Reflective and light-coloured elements are needed on such objects to make them visible at night
- An understanding is needed of where allowing continued access to the kerbside is necessary (noting that most forms of light segregation can be crossed relatively easily by most vehicles); this relates particularly to emergency service vehicles, community service vehicles and taxis, where they need to deploy ramps
- Access to the kerbside will often need to be maintained to allow for drainage, road sweeping and general maintenance

As is the case with full kerb segregation or stepped tracks, consultation with user groups – particularly local businesses, residents, access groups and commercial vehicle operators – is essential to ensure that user needs are met appropriately.

Light segregation should not be used where general traffic is expected to straddle it, although it may be suitable (depending on the product) to be over-run where there is a need for occasional crossing movements to access the kerbside.

Although this has yet to be tested fully, it is reasonable to assume that advice in section 4.2.3 above and in section 5.3.4 on how to begin and end kerb segregation (including how far ahead of a priority junction should it be ended) might also apply to light segregation.

As applied at Royal College Street, light segregation could be provided without road markings where there is no ambiguity for road users about the route for cyclists. This can work very well in 20mph areas, since there is less emphasis on communicating important messages to fast moving motorised traffic that have to be processed quickly. However, the areas set aside for cyclists cannot legally be enforced for cyclists' use. Good will between road users is required to ensure they are used as intended. For this reason, parking and loading restrictions are very often important to keep the 'lanes' clear of motorised vehicles, particularly motorcycles.

## Benefits

Light segregation has many benefits over full segregation in that it is easier to install, usually costs less, is more adaptable and does not create barriers to pedestrian crossing movements. Generally, it will not require excavation, physical adjustments to the structure of the carriageway or repositioning of drainage or utility covers. It should not constrain cyclists in the same way as full segregation, although this depends on the objects used and how they are spaced. In order to maintain an acceptable



Flexibility of infrastructure at Royal College Street, Camden has allowed for adjustment of lane widths and relatively easy replacement of damaged separators and planters

level of protection, spaces between objects should be no less than 2.5 metres and no greater than 10 metres on links. Tighter spacing can be considered on bends and junction approaches.

Most types of light segregation can be adjusted or removed relatively easily, making it suitable for trialling temporary measures to reallocate

carriageway space. Just as mandatory lanes may be a step towards other, more substantial forms of separation, so light segregation could be an interim stage to a more permanent form of segregation.

## Road safety considerations

Where any object is used in the carriageway it may be struck by a vehicle. Whatever the speed, this will have destabilising effects, to which cyclists and motorcyclists are most susceptible. These risks must be taken into account when designing infrastructure, particularly when it comes to widths and treatment of the beginning of a run of separating objects.

Consideration may be given to providing a more visible object – such as a flexible post, planter or island – at the beginning of a run. Trials in Salford have shown that these are effective in increasing the clearance that vehicles give to the cycle lane and preventing damage to the separators. For streets with 85th percentile speeds of 30mph or more, this treatment is recommended.

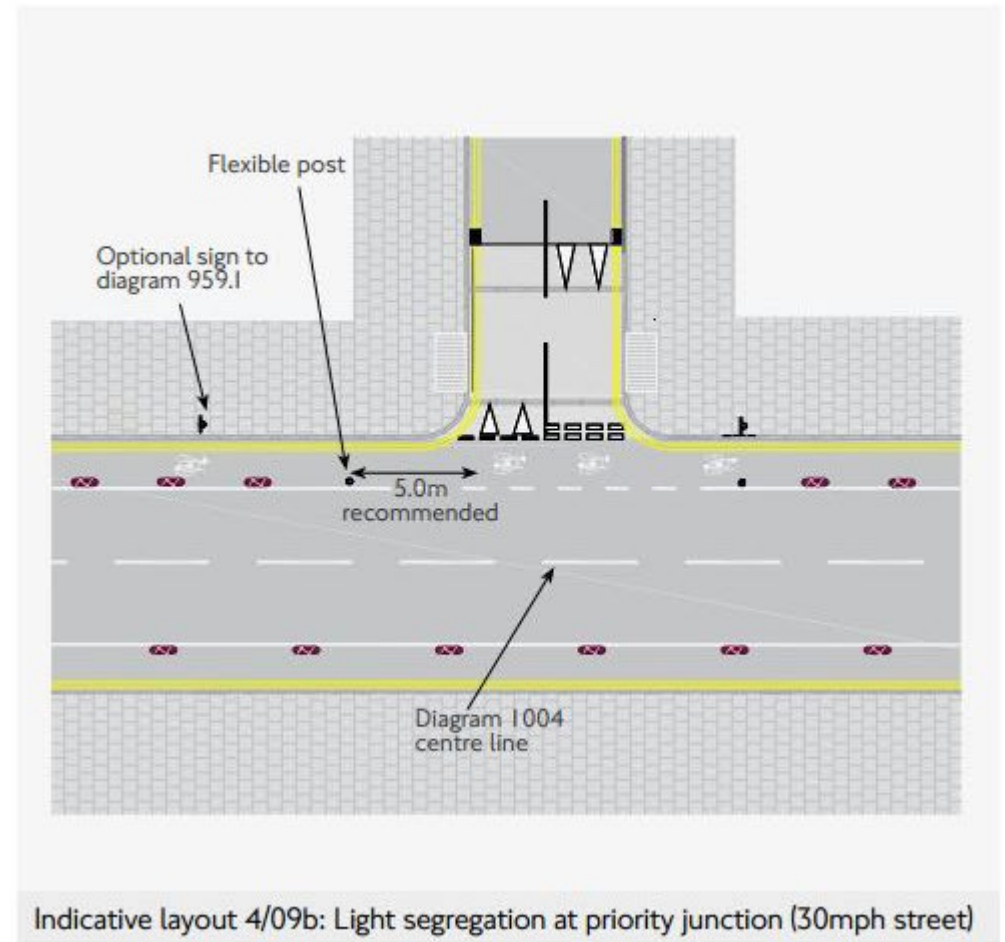
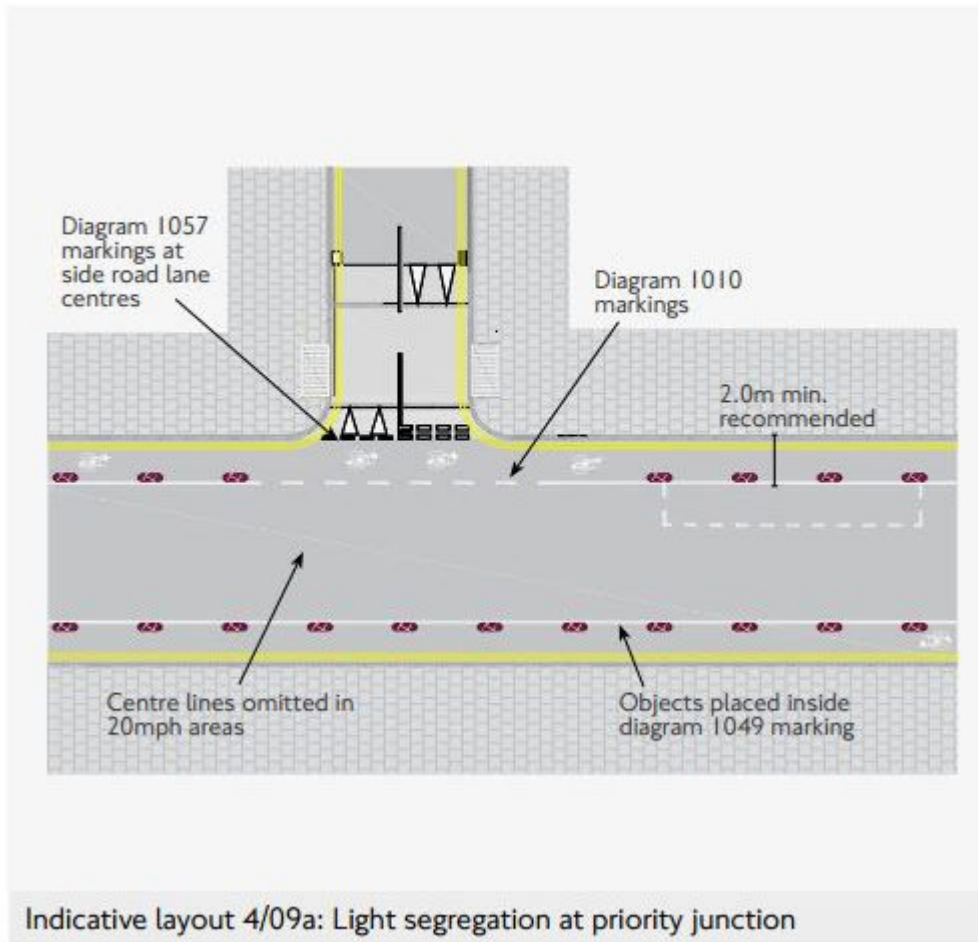


Temporary island at the beginning of a run of separators (Salford trial)



Trialling layouts using light segregation in New York: 'light' reallocation of space can help to make the case for more substantial re-engineering of the carriageway in time





[Read the full document here](#)