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Cycling infrastructure in London

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The aims of this article are to demonstrate the successes and failures of the £100 million London Cycle Network plus project and to discuss the standard of the highway engineering schemes delivered, particularly in relation to their overall effect on ride quality as defined by the cycling level of service assessment set out in the 2014 London cycling design standards. By highlighting areas where changes could have been made to improve the delivery of the project, it is hoped that lessons can be learnt for future projects of this type. The design approaches of each of London's 33 local authorities were cross-referenced against cycling growth and pedal cycle collisions. From the analysis, the project is shown to have had a positive impact on promoting cycling growth in central London but little identifiable impact on collisions. The article also shows how a reliance on shared-use footways as a design practice could reduce the propensity for people to cycle. As a conclusion, it is suggested that ride quality should be the primary measure of success even if, in reality, the cost of delivering this and the impact it may have on other road users may render the highest levels of service difficult to achieve at present. The paper is relevant to all those seeking to manage or set up major transport projects with time-constrained objectives. It will be of particular interest to those involved in the planning or delivery of cycling infrastructure.

1. Background

The aim of this article is to highlight some of the successes and failures of the London Cycle Network plus (LCN+) in the hope that lessons can be learned for future projects. Here, success is defined as a delivered scheme leading to a growth in cycling trips without a percentage increase in the total number of collisions. Design choices and project management decisions that enabled this standard of delivery are also defined as a success. Conversely, failure is defined as any scheme that reduced the propensity for people to cycle or caused an increase in collisions either through poor design decisions or the use of standard techniques that have subsequently been shown in practice to increase the risk of collisions for cyclists. Project management decisions that led to any deterioration in quality are also defined as a failure. This article aims to show that project management approaches can have a direct influence on engineering design quality and so will show some adjustments that could be introduced by those planning complex major projects.

In order to avoid subjectivity, each scheme – reviewed from archived annual reports – was assessed against criteria laid out in the cycling level of service assessment in the current London Cycling Design Standards (LCDS) (TfL, 2014a). This assessment system has six main categories, which are then subdivided into measurable indicators and unite to form an objective measure of ride quality. The system is in large part derived from the Chartered Institution of Highways and Transportation's cycle review (CIHT, 1996), which was launched in 1996 to tie in with the Department for Transport's National Cycling Strategy (DfT, 1996). Five of the six categories in the cycling level of service assessment are based on the *Design Manual for Bicycle Traffic* (CROW, 2012); these are safety, directness, comfort, attractiveness and coherence. The LCN+ project was delivered without the use of this system, but was based on the 2005 LCDS (TfL, 2005), which supported three main criteria – that routes be fast, safe and comfortable.

The paper is structured follows. The history and context of the LCN+ project is followed by a critical assessment of the project management processes involved in project delivery and their impact on the quality of infrastructure. A full review of each local authority's design approaches is then undertaken and referenced against census data from 2001 and 2011 and the percentage change of total collisions compared with an earlier control period. Finally, a detailed review of some of the main assets delivered as part of the project will be practically assessed for their ride quality using the 2014 LCDS as a reference. The paper concludes by outlining some lessons learnt for those planning similar major projects.

2. History and context of the LCN+ project

The establishment of a network of cycle routes has been a long-held desire of cycle campaigners in London for almost 40 years (LCC, 2008). In the late 1970s, the newly formed London Cycling Campaign (LCC), whose principal campaigning aim was the establishment of a strategic cycle network, put forward the concept of a 1000 mile (≈1600 km) cycle network. By the early 1990s, plans were established to deliver an extensive network of cycle routes across all London Boroughs and this was to be funded to

completion by the millennium. This London Cycle Network (LCN) was to be 2500 km long. In 2000, efforts were made by Transport for London (TfL) and the LCN project management team to establish priority strategic routes across this network that were both direct and linked town centres across London. This core network, rebranded as LCN+, received over £100 million worth of investment between 2002 and 2010 (LCN, 2010).

The LCN+ project was closed down, unfinished, in 2010, having failed to meet its delivery target and having fallen out of favour with the new mayoral administration that wanted to focus on the cycle hire, superhighway and greenway projects. Since then, some local authorities wishing to complete their sections of the network have done so from other funding sources, whereas other local authorities have concentrated on differing transport priorities. From 2010, the main cycle network for investment in London has been the TfL-controlled cycle superhighways, which seek to provide 12 discreet mid-range radial commuter routes into and out of central London. Many of these routes form part of the existing networks but, due to the level of investment and differing design standards, provide a higher level of service. In 2013, the Mayor of London launched his 'vision for cycling', which aimed to improve the superhighway routes and establish a series of high-quality back street routes called the 'quietways' (TfL, 2013). Figure 1 shows the LCN, LCN+ and original cycle superhighways as they were planned in 2010.

3. Influence of the project management process on design quality

The LCN+ project employed the following methodology in order to move schemes from inception and scoping stages through to delivery and ongoing maintenance.

- A straight line was drawn between town centres across London and this line was then mapped to the nearest available road or existing cycle route.
- This corridor was then assessed using a strategic feasibility process called the cycle route implementation and stakeholder plan (Crisp), which gave costed recommendations for infrastructure improvements.
- These recommendations were then prioritised using optimisation criteria and the highest priority schemes were packaged and sent to TfL for funding approval.
- Once funded, a baseline programme was assembled and resources made available.
- The schemes were then delivered by local authorities.

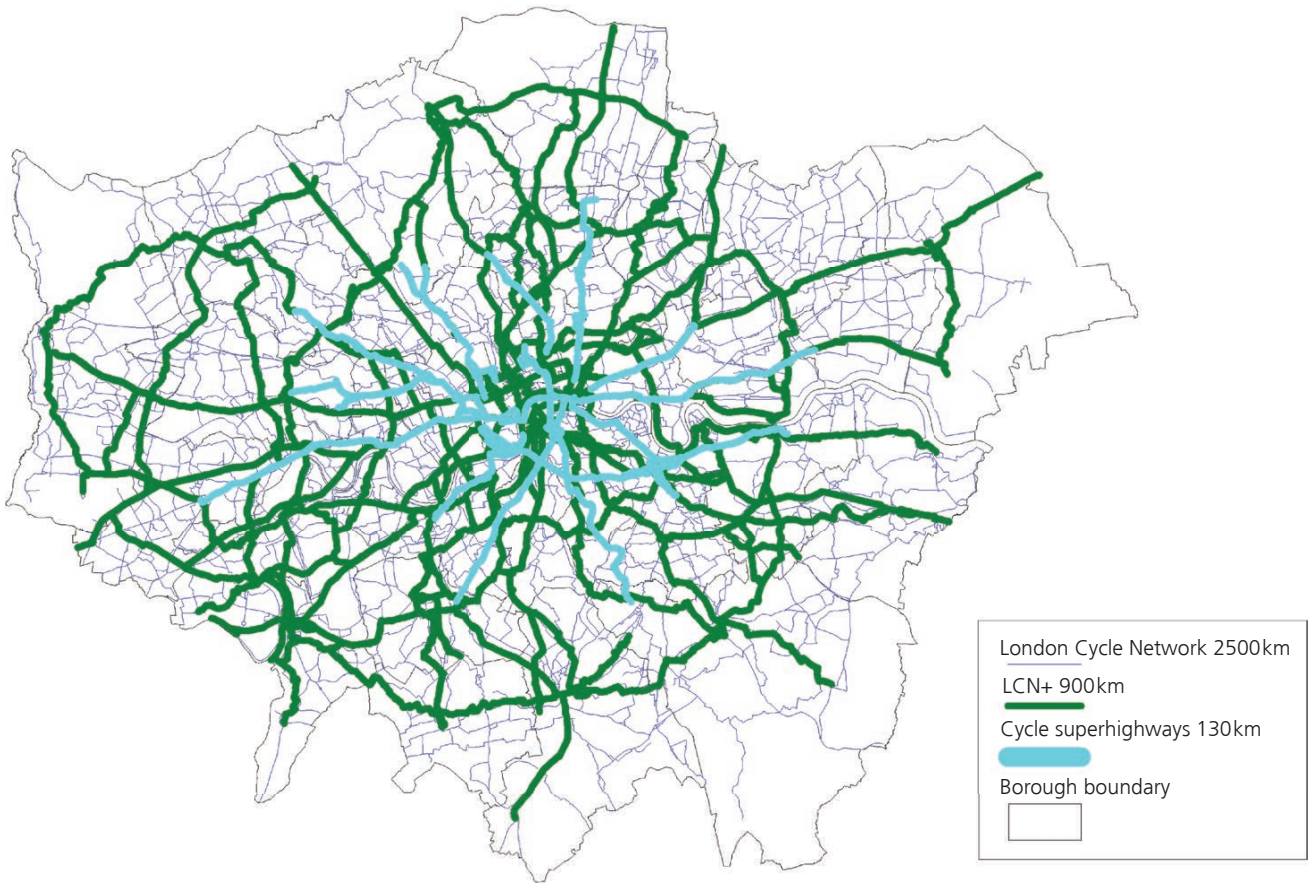

Figure 1. Planned cycle networks in London up to 2010

- A network tracking GIS system would then be updated showing the new status of each network segment following delivery of its associated Crisp recommendation.
- Network completion statistics would then be compiled for monthly reporting.
- Finally, a yearly asset inventory ridden assessment would be undertaken to ensure the scheme was functioning correctly (LCN+, 2008).

Figure 2 shows the extent of LCN+ network completion at project closedown. Percentage completion for each local authority is shown in Tables 1 and 2.

The methodology was developed based on standard scheme delivery approaches but one crucial factor was omitted due to time and monetary constraints. The assumption was made that once all the Crisp recommendations had been completed, the network was complete. This project management decision failed to take into account the overall usability and level of service to users of the routes. Crisp approaches and delivery strategies varied greatly across boroughs (Deegan and Parkin, 2011) and so a completed section in outer London may be below the acceptable standard of a completed section in inner London. Likewise, an incomplete section could still be useable if the recommendation was to take the route to a standard beyond that stipulated in the 2005 LCDS. On the other hand, a completed section could be difficult to ride if participants in the Crisp process felt nothing could be done to improve conditions for cyclists. The state of completion of the network was accordingly distorted by methodological errors.

The target for the project was to deliver 900 km of network and so the length of network delivered each year became the key performance indicator (KPI) and the cost per kilometre became the main area of scrutiny. This led to an over reliance on schemes with a long asset length such as cycle lanes that were relatively cheap and long. Junction treatments, on the other hand, can be expensive and difficult and do not give much of a contribution to completed network length.

During the LCN+ project, 147 high-risk infrastructure barriers to cycling were identified on the network (TfL, 2007). By the end of the project, only 17 had been rectified and so most difficult sections were not resolved. However, many of these barriers were

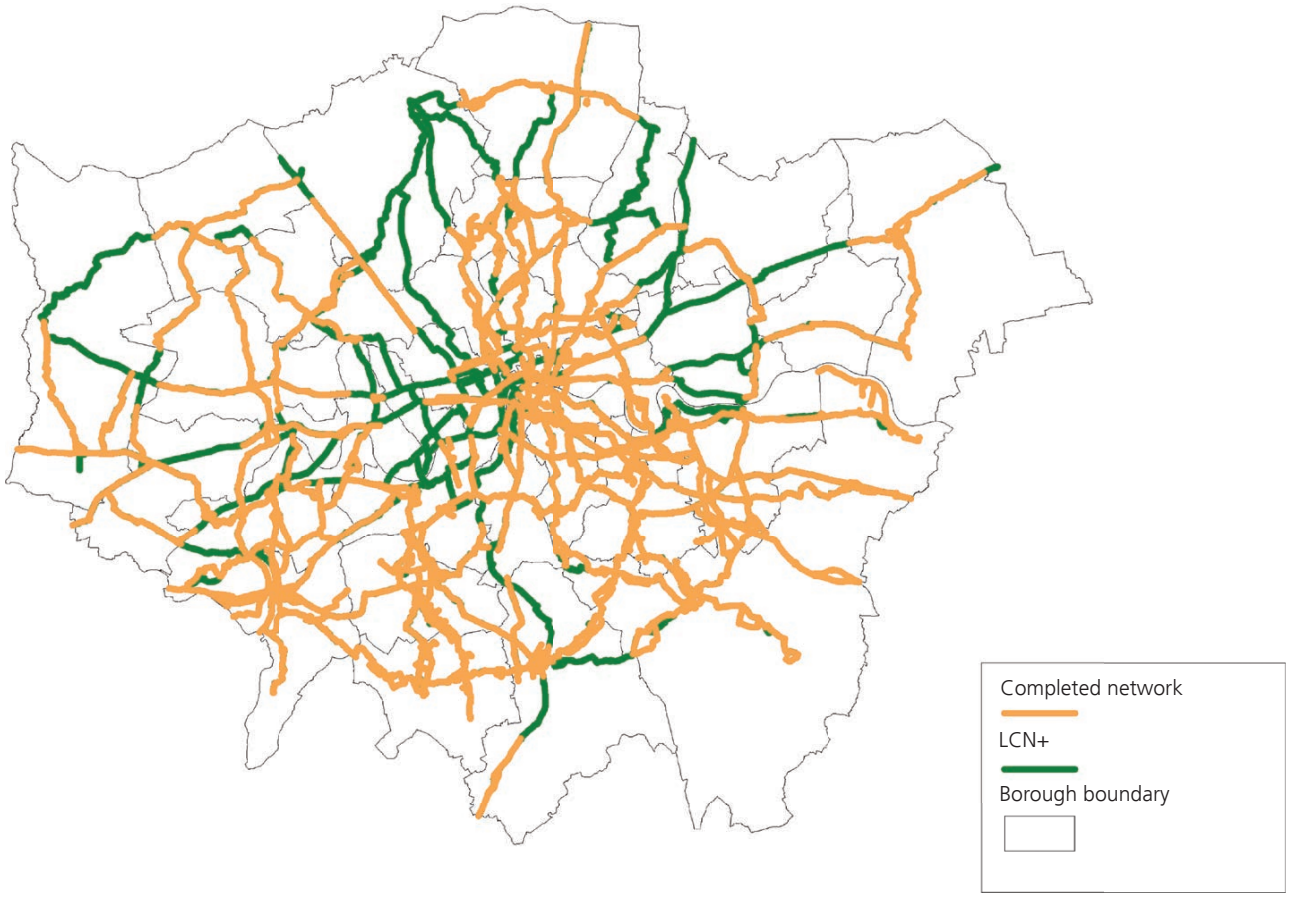

Figure 2. Extent of LCN+ network completion at project closedown in 2010

Local authority	Design approach	Proportion of network complete: %	Increase in cycling trips, 2001 to 2011: %	Cyclists KSI: % change in 2010 over 1994–1998 average
Camden	20 mph, tracks, lanes, traffic calming	75	**100**	**–26**
City of London	Lanes, traffic calming	44	228	143
Hackney	Lanes, traffic calming, permeability	77	232	22
Hammersmith and Fulham	Lanes, traffic calming	60	80	–31
Haringey	Lanes, tracks, traffic calming	67	**148**	**–7**
Islington	20 mph, lanes, traffic calming	84	**159**	**–8**
Kensington and Chelsea	No delivery (control)	7	74	0
Lambeth	Lanes, traffic calming	87	139	2
Lewisham	20 mph, lanes, paths	67	**143**	**–15**
Newham	Lanes, tracks, paths	88	82	11
Southwark	Lanes, traffic calming	85	164	42
Tower Hamlets	Tracks, lanes, traffic calming	76	252	46
Wandsworth	Lanes, traffic calming, paths	74	**133**	**–9**
Westminster	Lanes, paths	42	104	–1

Table 1. Inner London local authority design approaches measured against cycling trips and collisions. Figures in bold show whether the project could be seen as having a measurable positive impact beyond the control group underlying trend. Definitions of inner London are taken from the Office of National Statistics (ONS) definitions, which exclude Greenwich and include Newham and Haringey. The design approaches referenced are abbreviated for ease of use. 20 mph refers to the extended use of 20 mph (32 km/h) zones and limits applied consistently across areas where the cycle network was in place. Tracks refer to cycle tracks defined as segregated facilities alongside the carriageway. Lanes refer to both advisory and mandatory cycle lanes. Traffic calming covers both vertical and horizontal traffic calming techniques such as road humps, side road entry treatments, tables and chicanes. Permeability refers to contraflow cycling being permitted on one-way streets in a structured way; sometimes full point closures for general traffic were employed with cycle access maintained. This was done in order to remove through traffic and create routes where cyclists are the dominant mode

gyratory systems and large complex junctions that would have required a high level of investment beyond the £1·5 million maximum annual budget allocated to local authorities on LCN+. It should also be noted that when the project was being delivered the political will to improve conditions for cycling by making expensive impacts on the strategic highway network that could reduce motor traffic capacity was not as strong as it currently stands. TfL began a junction review programme in 2012 and many of these LCN+ barriers were included.

4. Project delivery assessment

In order to attain a measure of success or failure in scheme delivery, the author reviewed LCN+ annual reports and examined the type of schemes delivered in terms of the cycling facility assets associated with them and the approach to design. Table 1 shows the approach to designing for cyclists referenced against the change in percentage of commuting trips made by cycle taken from Office for National Statistics census data 2001 and 2011 and the percentage change of pedal cyclists killed or seriously injured (KSI) in 2010 compared with a prior control period of 1994–1998 (TfL, 2011). An increase in the number of trips made by cycle during this period coupled with a stabilisation or reduction in collisions is used as affirmation that the design approach employed by the local authority was a success. A stabilisation or reduction in the number of cycling trips coupled with a stabilisation or increase in collisions is used as affirmation that the design approach was not successful.

In central London especially there were several other factors that affected the increase in number of cycling trips. In particular, the congestion charge and the London bombings (a series of terrorist explosions on London transport on 7 July 2005) are recorded as leading to sharp increases in the number of cycling trips (TfL, 2009). As the LCN+ project was the only cycling project operating in London during this period, the infrastructure delivered is considered to have an impact. There is not much evidence to support this claim, but a survey taken of 98 central London organisations in 2005 showed that 55% of the overall length of journeys made by cycling commuters used LCN+ routes (CLP, 2005), thus providing some evidence to support the impact the project played in facilitating cycling growth.

The inner London local authority of Kensington and Chelsea was used to test the validity of the methodology. Kensington and Chelsea did not engage in the LCN+ project and saw no changes to its collision KSI percentage whilst cycling percentage increased by 74%: this is used as a measure of the percentage increase without the introduction of cycle-specific facilities and so gives an

Local authority	Main design approaches	Proportion of network complete: %	Increase in cycling trips, 2001 to 2011: %	Cyclists KSI: % change in 2010 over 1994–1998 average
Barking and Dagenham	Lanes, shared footways, traffic calming	96	4	–47
Barnet	No delivery (control)	4	75	–17
Bexley	Lanes, shared footways	60	23	–33
Brent	Track, lanes, traffic calming	69	**91**	**–83**
Bromley	Lanes, shared footways, traffic calming	80	64	–44
Croydon	Lanes, paths, traffic calming	72	31	–62
Ealing	Lanes, tracks, traffic calming	62	51	–37
Enfield	Lanes, shared footways, paths	78	33	–62
Greenwich	Lanes, traffic calming	46	100	22
Harrow	Lanes, tracks	67	2	–59
Havering	Lanes, shared footways, traffic calming	71	9	–74
Hillingdon	Tracks, shared footways, lanes	73	–6	–59
Hounslow	Lanes, shared footways, traffic calming	70	27	–43
Kingston upon Thames	Tracks, lanes, traffic calming	74	41	–50
Merton	Lanes, tracks, traffic calming	63	54	–40
Redbridge	Lanes, shared footways, traffic calming	40	40	–68
Richmond	Lanes, shared footways, paths	73	67	–11
Sutton	Lanes, shared footways, paths	72	5	–20
Waltham Forest	Lanes, shared footways, traffic calming	70	94	–8

Table 2. Outer London local authority design approaches measured against cycling trips and collisions. Values highlighted in bold show whether the project could be seen as having a measurable positive impact beyond the control group underlying trend

indication of the trend and the effect of other interventions. For the purpose of this analysis, Kensington and Chelsea is thus viewed as the control group for inner London. Likewise, Barnet did not engage in the project and saw a 75% increase in cycling trips and a 17% decrease in the total number of collisions. Barnet is thus used as the outer London control group. Across London as a whole there was a 101% increase in cycle trips and an 18% decrease in collisions. When the control group figures are applied across the whole of London, then the LCN+ project would be seen to have had little to no impact on collisions if Barnet is used as a comparator or a −18% impact if Kensington and Chelsea is used. However, this is inconclusive due to the variance of inner and outer London control group figures and so it is hard to say if, as a whole, the LCN+ project had a noticeable positive impact on collisions. As both control groups had very similar increases in cycling trips during this period, there is more evidence to support the assertion that the project could be said to account for an approximate 25% increase beyond what would have been expected.

Given the control group assumptions, Brent, Camden, Haringey, Islington, Lewisham and Wandsworth could be viewed as employing design approaches leading to outlying project success. None of these local authorities focused on shared footway schemes. In outer London, only three authorities experienced an increase in cycling trips beyond the underlying trend and two of these authorities did not undertake any shared footway schemes. Likewise, four of the five authorities with the smallest increases all favoured shared footway facilities as their primary design option. Of the 11 boroughs that did utilise shared footways, ten of them fell below the underlying trend, which suggests that focusing on this type of infrastructure may actually deter cycling growth. Examples of shared footways are assessed in detail in Section 5.

Islington and Lewisham progressed with 20 mph (32 km/h) zones and limits to the largest extent over this period, and this could have led to the collision savings shown in Table 1 despite their notable increases in number of cycling trips. The 2005 LCDS suggest that reductions in motor vehicle speeds and volumes can be beneficial for cyclists, and this data provides some evidence to support this claim.

Notably, both local authorities that saw the largest rise in cycling numbers also saw a rise in pedal cycle collisions. If the LCN+ project was not in place, this correlation would have been expected given that cyclists are vulnerable road users. However, a KPI of the project was to provide safe cycling conditions and so these increases seem to suggest a fault in the design approach. During this period, Hackney developed a unique approach of

filtering motorised traffic for the benefit of walking and cycling and this could account for the large increase in the number of people cycling, but the analysis suggests that some areas were prone to pedal cycle collisions. Hackney's focus on back street filtered permeability rather than main road and junction interventions, where most collisions take place, could account for this.

Tower Hamlets focused mainly on one key corridor that was later to become one of the first cycle superhighways. This route proved popular in enticing new cyclists due to its fully segregated two-way cycle track but it had several collision hotspots along its length, particularly at uncontrolled side road crossings. A collision analysis was undertaken as part of this project on all the schemes referenced. Data from Stats19 police reports were used. This type of facility is stated as being problematic for cyclists in the 2014 LCDS (TfL, 2014a), mainly as a result of analysis of the collisions associated with facilities of this type delivered during the LCN+ project.

Brent and Camden showed notable increases in cycling beyond the control group expectations and both saw reductions in collisions, albeit to different levels. Camden focused mainly on delivering two-way cycle tracks and some of these encountered the same increases in collisions associated with the Tower Hamlets two-way tracks. However, Camden improved conditions along several routes using cycle lanes, 20 mph zones and traffic calming techniques, and this seems to have increased cycling while reducing collisions and effectively offsetting the issues associated with two-way cycle track segregation. Brent's focus on home zone treatments seems to have been effective but it should also be noted that Brent undertook a large-scale transport improvement project around the Wembley area that could account for the much larger than expected reduction in collisions.

The control group analysis suggests that the LCN+ project was not effective in outer London as only one local authority passed the 'do nothing' control authority threshold. Although London's boroughs are sometimes very different in geographical and social terms, this negative representation of the project seems accurate. The mini-Holland programme associated with the Mayor of London's vision for cycling is a concerted attempt to make cycling in outer London work by focusing investment in certain key areas. This approach may prove more successful than the LCN+ attempts at linking lots of small measures of variable standards and levels of service.

According to LCN+ annual reports from 2002 to 2010, approximately £100 million was spent on the LCN+ project, resulting in the delivery of

- 683 km of a fast, safe and comfortable cycle network as defined by the 2005 LCDS (TfL, 2005)
- a delivery cost per kilometre of £346 000 in inner London and £283 000 in outer London
- 3100 schemes
- 97·74 km of new cycle lanes
- 31·64 km of cycle tracks
- 33·54 km of shared-use pathways
- 166 advanced stop line boxes
- 32 toucan crossings
- 621 traffic calming measures
- 1601 assets.

5. Quality and consistency of design

In the early stages of LCN+, the design standards for LCN were used until a new design standard could be set. The 2005 LCDS (TfL, 2005) were published in May 2005 and laid out a plan for the design of the new network. As a way of illustrating the changes between documents, the *London Cycle Network Design Manual* published in 1998 stipulated that 1·2 m wide cycle lanes were acceptable whereas the 2005 LCDS tried to ensure 1·5 m was the standard (Figure 3). By 2008, DfT guidance on cycle infrastructure design (DfT, 2008) was stipulating 2 m as a recommended lane width, but there are few examples of this being applied in London. Cycle lanes are seen as one of the most recognisable infrastructure measures for cyclists as they provide a clear highlighted space in the carriageway. However, if not enforced by traffic orders, these lanes can often be blocked by

Figure 3. Cycle lane with associated parking restrictions, meaning it will be clear of traffic and so ensure a more consistent level of service to cyclists. When assessed using the cycling level of service, the scheme scores 40 out of 100, meaning it provides a good level of service. The main concern would be the feeling of safety as motor vehicle speeds are not calmed and the carriageway is wide and straight. This led to a critical issue as 85 percentile speeds exceed 30 mph (48 km/h). As a critical issue has been raised, the overall score is not relevant as the issue should be resolved in the design, either through traffic calming or a greater degree of segregation. The parking restrictions do mean that conflict with kerbside activity is minimised and this is a critical factor

parked cars (TfL, 2014a). The current (2014) version of the LCDS (TfL, 2014a) suggests that they can reduce collision risk but make little contribution to cyclists' feeling of safety as they offer little protection on links with high motor traffic flows. On certain street types, cycle lanes suggest a riding position that contradicts the national cycle training standard and so may lead cyclists into potentially high-risk situations, particularly at junctions (Figure 4). The 2014 LCDS take a very negative stance on the use of shared footways, suggesting that cyclists be treated as vehicles and removed from positions of potential conflict with pedestrians as shown in Figure 5.

LCN+ used busier, more direct roads than the LCN network and so the demand for carriageway space was higher, meaning that many of the cycle lanes implemented encountered the problems shown in Figure 5. Another issue with cycle lanes on LCN+ (as referenced in the annual reports) is that some disappear on the approach to major junctions to make way for multiple general traffic lanes in order to maximise flow through the junction. This issue still exists, with a common remedy being to take cyclists off the carriageway onto a footway and lead them across the junction on toucan crossings. Local authorities would need to be willing to accept theoretical capacity losses and over saturation at some signal control junctions in order to give separate space to potential cyclists on carriageway at junctions and this could result in network congestion if road users do not switch modes. Options for moving cyclists safely through junctions where 83% of collisions occur (TfL, 2014b) are limited and so the standard treatment on LCN+ was to take cyclists off the carriageway at major signalised junctions.

There were 30 different asset types recorded on the LCN+ project, ranging from linear assets such as lanes and tracks to crossings, junctions and structures. Each asset type had design issues and evolved throughout the LCN+ project lifecycle. Advanced stop line boxes went from 4 m to 5 m deep so that lorry drivers could

Figure 4. Cycle lane leading to obstruction. This photo shows a cycle lane in a nearside position where there is space on the approach to a junction. The cycle lane does not appear on the other side of the junction and is aligned with the kerb line of the footway. Parking is also permitted across the junction and so cyclists encouraged into a nearside position on the approach would have to move across by at least 4 m to line up with straight-ahead traffic at the point where two lanes of general traffic would merge into one. This transition from secondary to primary position across a junction is referenced as a critical design failure in the cycling level of service assessment (TfL, 2014a). The assessment score is 28 out of 100, meaning it offers a basic level of service. This scheme also has two critical issues – the risk of 'dooring' from kerbside activity as cyclists move past the parked cars in a confined space and the choice of putting cyclists into secondary position, that is to say nearside, when approaching a pinch point

Figure 5. Cycle lane marked on the edge of the footway with transition back onto carriageway at 90° to traffic flow in an uncontrolled manner at a signalised junction. This photo shows that cyclists are asked to use the footway despite three general traffic lanes being present. This highlights the two approaches to designing for cyclists that engineers commonly use. Cyclists can be allowed onto pedestrian areas and advised to cross with pedestrians as a means of shielding them from conflict with motor vehicles (with larger mass and higher speeds) or cyclists can be recommended to take their place on the carriageway and behave as a vehicle mixed in with other vehicles. Transitions from one approach to another characterise delivery on LCN+, as evidenced by this photo. This inconsistency of approach is referenced as a major deterrent to cycling in the Mayor's vision for cycling (TfL, 2013). The cycling level of service assessment score is 29 out of 100, which means it offers a basic level of service. It has two critical issues – heavy streams of left-turning traffic cutting across the unprotected nearside cyclists and secondary position promoted where there is no space provided within the lane

see cyclists below from the front of their carriages, and round-top road humps and speed cushions were replaced with sinusoidal profile humps to lessen the impact on bike wheels in the former and to avoid vehicles swerving into the path of cyclists on the latter (Figure 6).

Cycle gaps and point no entry treatments paved the way for area permeability whereby access to cyclists through one-way streets and closures was maintained while general traffic was forced into circuitous routes (Figure 7).

During this period, the use of 'except cyclists' plates with 'no entry' signs was authorised and this opened the way for many one-way streets to allow two-way cycling as splitter islands were no longer required. The LCN+ project and the 2005 LCDS attempted to change London's streets into more cycle-friendly environments through design innovation. Its approach, as evidenced by the annual reports, was one of making many small incremental changes that would hopefully add up to a calculable difference in the level of service cyclists receive on roads. Many measures delivered – such as junction tightening, side road entry treatments and formalised parking – may not be obvious enticements to cycling but they do improve conditions for cyclists (Figure 8).

6. Conclusions and lessons learnt

The project-wide analysis conducted in this research suggests that any increase in cycling trips associated with the LCN+ project was not associated with a decrease in collisions beyond the underlying trend. A correlation here would have provided clear evidence for the success of the project as these two measures are often used as KPIs in cycling schemes. However, this article has presented strong evidence that certain infrastructure types and design choices can lead to increases in cycle use. It also showed that a local authority focus on mixing cyclists with pedestrians on footways serves to reduce the propensity to cycle below the underlying trend. This evidence supports the strategy for cycling infrastructure delivery shown in the latest version of the 2014 LCDS, which asks that cyclists be treated as vehicles not as pedestrians and be given protected space on the carriageway where appropriate (TfL, 2014a).

Each country, province and local authority must develop its own strategy for the successful promotion of safe cycling. It is hoped that this article will send out a clear message to other highway authorities of what is most likely to work and what may be working against their stated policy aims.

Project management techniques and performance indicators can, to an extent, affect the quality of delivery, but clear design guidance seems to play a larger part as the effect of doing something that is well meaning but misguided for cycling seems to reduce the propensity to cycle beyond the 'do nothing' scenario.

For future cycling infrastructure projects, it is suggested that a baseline level of service is established before investment and that this be readdressed post-completion. This would hopefully also address some of the compromises in scheme designs that affect so many attempts to improve conditions for cyclists.

Figure 6. A speed hump with a sinusoidal gradual slope rather than a round-top hump presents a much smother riding experience for cyclists without the impact of hitting the more vertical round-top profile. This was a key innovation brought in as part of the LCN+ project. The cycling level of service score is 72 out of 100, with the scheme scoring well in the 'feeling of safety' factors as it is a quiet back street route with traffic calming. This route offers the highest level of service despite the fact that no obvious cycling provision is in place

Figure 7. Point closure: road closed to general traffic but cyclists are allowed to move through. This effectively removes motorised through traffic, creating a pleasant, quiet and almost traffic-free situation (residents are still permitted to drive and park outside their properties). This scheme scores 76 out of 100 on the cycling level of service assessment, offering the highest level of service. It scores particularly well in terms of directness and feeling of safety

Figure 8. Inset parking bays. This photo shows a loading bay relocated to a wide footway in order to continue a cycle lane and reduce nearside conflict for passing cyclists. Repositioning parking bays may not be the most obvious cycling infrastructure asset but small measures like these can help improve comfort and safety for cyclists as they keep the road space and cycle infrastructure clear of blockages. This is referenced in the 2014 LCDS (TfL, 2014a) as nearside conflict. This scheme scores 49 on the cycling level of service assessment, which means it offers a good level of service. This route has no critical issues and helps resolve the issues associated with kerbside activity past loading bays

The one and only measure of success for cycle routes should be ride quality – the experience of actually cycling along a route. The 2014 LCDS (TfL, 2014a) define this through the level of service assessment tool and this tool should, if used correctly, ensure that some of the mistakes made on the LCN+ project are not repeated. Ride quality is improved when the most appropriate solution is chosen for the street environment. There are a myriad of influences on ride quality and each one can become crucial when enticing new people to cycle.

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