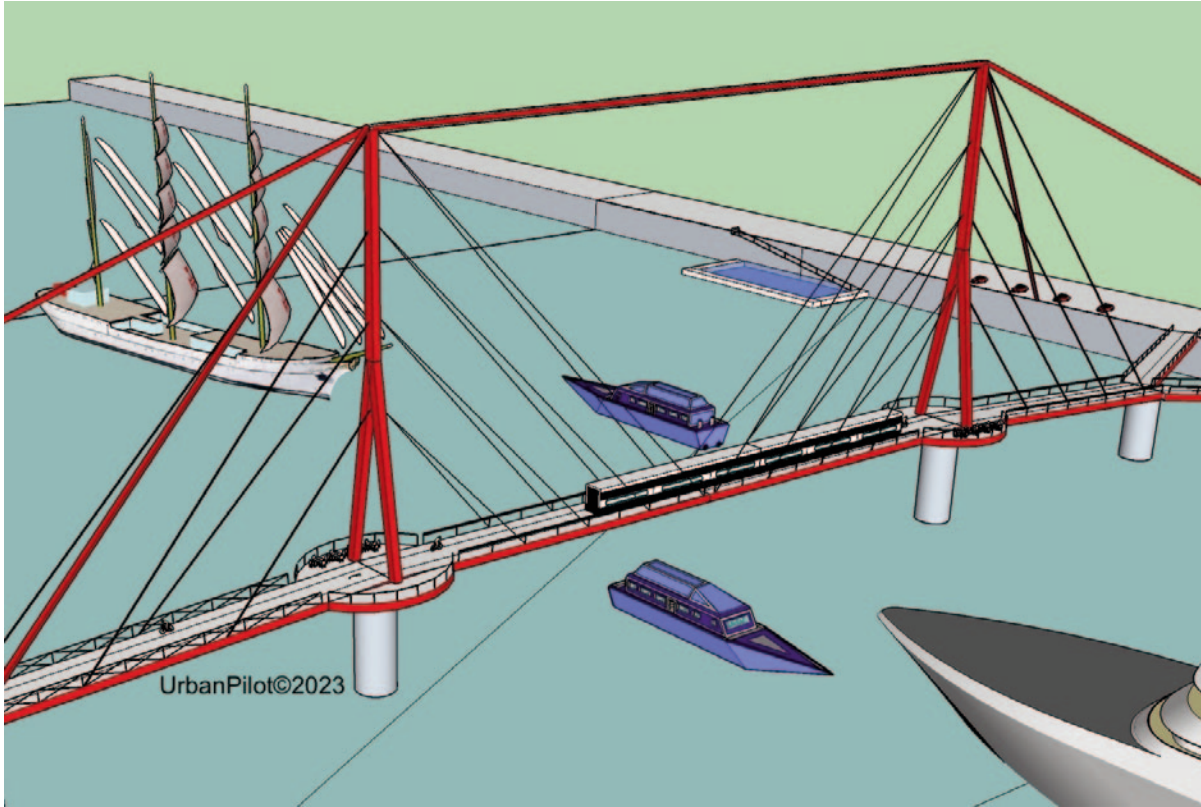


How to raise £1bn annually for net zero transport

Lars Christian argues that to raise billions for net zero transport infrastructure, thinking the unthinkable is possible



This article contains a fivefold strategy for the mayor, assembly and parliament to pursue: i) Turn all paths into shared paths throughout London and the metropolitan greenbelt, with minimum width set by secondary legislation; ii) Create half a dozen bike priority outer borough town centres; iii) Extend the DLR, Tram and Overground in the outer boroughs; iv) Build 3-4 suspension swing bridges; two short rail tunnels; and v) Build up to eight car and lower van toll tunnels.

How to generate up to £1bn annually for transport infrastructure? With a majority of households paying their share; Where the top two decile earning households pay on average £2.5k annually, direct and indirect; The two next decile £1.5k; The two middle decile, and four bottom decile car households £500; And with the four bottom decile car-free households contributing nothing.

Single tube toll tunnels

Instead of building the £19bn, 23 km, 16½m diameter Lower Thames Crossing; and/or the £+30bn Crossrail 2. Consider building up to eight toll tunnels, altogether up to 55 miles, The toll tunnels are for 2½m high e-vans and e-cars only*. In 14m internal diameter tunnels, split horizontally in two halves; With

three lanes in each direction, and a forth emergency lane. With each tunnel costing a fraction of the above two sums. The eight tunnels serve eight inner and nine outer boroughs; nine north and eight south of the river.

There are three purposes for the toll tunnels: i) To raise revenue for bike, pedestrian, and public transport investments and improvements; ii) To nudge most outer and inner borough households to turn to e-vehicles; and iii) To make north-south journeys and south-south journeys more comparable to east-west journeys (M4, A40), and diagonal journeys. (M1, M3, A3, M20, A20, A2, A13, A12, M11).

There are three precedents for this**: In Oslo, where more than half the toll tunnel revenue goes to public transport, for 30+ years; With the initial full hight tunnels opening in 1989***. Sydney has an extensive network of toll tunnels, apx 33+15+9 km. And the nearest similar restricted hight tunnel is in western Paris; With two lanes and a hard shoulder, for up to 2m high vehicles; Inside a 10½m internal diameter tube; 10 km long, with one intermediate junction, at €2½bn in 2011. It is similar in diameter to the Silvertown tunnel. The HS2, Blackwall, Rotherhithe and Channel tunnel internal diameters are all a little smaller, at 9.1m; >>>



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>>> 8.2-8.6m, 7.6m and 7.6m diameter respectively.

There are additional benefits of the eight toll tunnels, direct and indirect: To London households, businesses, productivity, competitiveness, and society at large; Less pollution and noise; Better access for vans, lorries, cyclists and similar; On the new toll, and the existing (strategic) road network; Improved access, for the self employed, SME and skilled professionals;

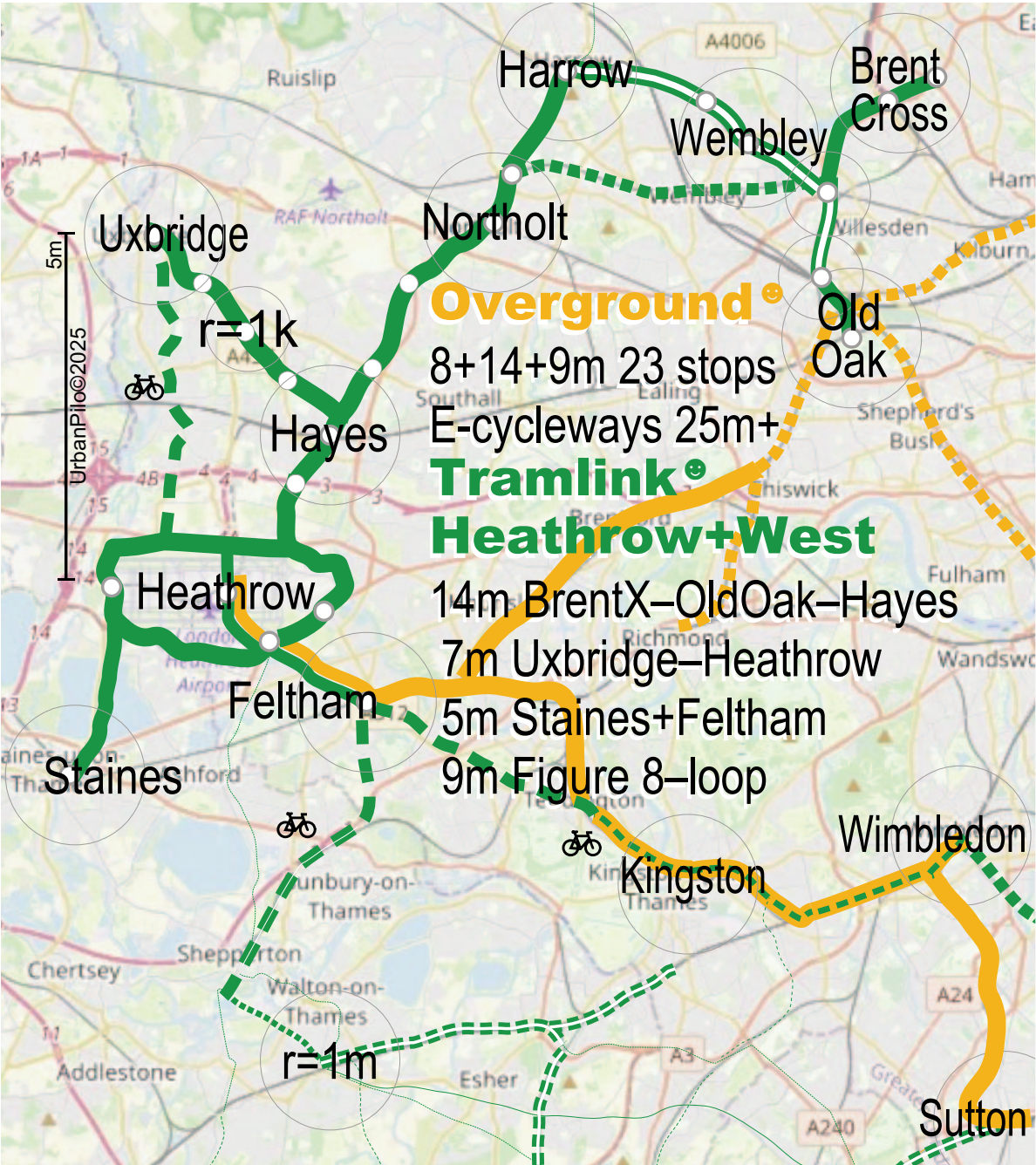
Up to eight potential toll tunnels

- Two toll tunnels form a north-south strategic e-car axis; Linking in the north with the M25 and the North Circular; And in the south with the South Circular toll tunnel, Croydon, and the M23.
- The Great North toll tunnel, starts at Holloway; Intersects halfway with a free off-peak 2 mile tunnel under the North Circular, between Arnos Grove and A10; And continues north to the M25, ending halfway between junctions 24 and 25.
- The Great South toll tunnel, starts at M23 at Coulsdon; With a junction under Croydon; And a no exit/entry junction under Crystal Palace; With the nearest exit and entry 2½ miles further east and west at Streatham and Catford.
- The South Circular toll tunnel extends from White City to Eltham; With five intermediate junctions, at Hogarth by Chiswick, Wandsworth, Streatham, Crystal Palace and Catford.

- The M3 toll tunnel, extends 4 miles from Hogarth to Twickenham; With or without a junction at Richmond. The M1 toll tunnel extends 3 miles from Swiss Cottage. The Tower Bridge toll tunnel extends 2 miles from Aldgate to Bricklayers Arm. And the Woolwich toll tunnel extends 1½ miles between the Gallions/Pettman/Plumstead roundabouts. Reserving the bridge for bikes, buses and lorries, and the ferry for lorries, both tolled at peak hours.
- At the Lower Thames Crossing, restricted height toll tunnel extending maybe 4 miles, is supplemented by: A combined tram-train between Romford via Lakeside and Bluewater to Ebbsfleet, sharing a single two directional track across the Dartford Bridge; The two remaining bridge lanes reserved for vans and lorries only, one in each direction; With the existing tunnel, reserved for vans and cars only; With one single lane (entering, one half of the tunnel length); and two lanes (exiting, second half the tunnel length).
- There may be other worthy options of (shorter) toll tunnels to consider, including; 1.5 miles from Hammersmith to Earls Court.

Tolls, revenue & finance

With 100k cars daily in each direction in each tunnel (half travelling half the length, half the entire length; half off peak,



half peak hours); The revenue may amount to £1bn annually; if the above pay £2.5, £4, £4, £6 respectively; Charges similar to the half a mile long Silvertown/Blackwall tunnels.

What are the financial alternatives that can raise a billion annually for zero emission transport infrastructure? Tax on goods transport, businesses, home ownership, land ownership. As for the former, western European nations typically tax goods transport, except Sweden, Ireland, UK.

Raising the income tax for employees living in London may also be pursued; On par with the flexibility Scottish and Wales parliaments have to vary income tax by two percentage points. Supplemented by peak hour toll charges at bridges west of Lambeth Bridge; Peak hour toll charges crossing borough boundaries; And toll tunnel charges; The four together may contribute to finance some of the following:

Zero carbon green transport & public realm

- A strategic network of concentric shared bike and pedestrian paths throughout outer London; And potentially the metropolitan greenbelt; With a minimum width of 3-4-5-6 metres between hedges, fences and walls, defined by secondary legislation****(see PIL103);
- Complete the Thames Path in East London by 2044, the centenary of its conception; From Canary Wharf Pier via Barking Creek to Rainham; And from Rotherhithe to Dartford Creek;
- Recreate Croydon, Bromley, Romford, Uxbridge, Ealing, Harrow and/or Brent Cross as bike priority town centres; Including a SuperBikeLoop between the seven centres, and the three existing cycle friendly ones; Richmond/Twickenham, Kingston and Enfield; And extend the TfL bikes to the ten centres; and retail parks along the orbital Overground; supplemented by cargo bikes;
- Net zero public transport
- A Heathrow to Feltham train tunnel; And a Heathrow & West

- >>> London Tramlink; The train tunnel joining Waterloo to Reading and Paddington to Staines; The Tramlink joining Feltham, Staines, to Uxbridge, Harrow, Brent Cross (see PIL113);
- Extension of the Tramlink and DLR in east south east; The Tramlink to Crystal Palace; via Bromley, Eltham to Woolwich; The DLR to Ilford, Abbey Wood, Eltham (figure);
 - Extension of the orbital Overground west south west; Joining Acton, Heathrow, Kingston, Wimbledon, Sutton, Croydon (figure); With a 20min frequency via Hounslow and Brentford; 20min to Richmond and 10+10min to Clapham Junction (c/w+a/c/w) ;
 - A 2mile Thameslink West tunnel, from Victoria to Marylebone; with one intermediate station; Joining Clapham Junction, Brixton, to West Hampstead, Gospel Oak (PIL111);
- Five net zero carbon transit bridges
- Commission one West London and three East London pedestrian/bus/tram/DLR double fan design cable stayed swing bridges at Rotherhithe/Canary Wharf, North Greenwich/Blackwall, Thamesmead/Barking; With five tension cables, one extending between the two towers, and two between each tower and land, forming two fixed triangular structures, to hold the two towers in place for generations; With the roadway fixed to each tower, swinging open a few times a day (figure; see also PIL117);
 - Commission a new Hammersmith toll bridge, with combined bus and bike lanes; Possibly a high grade steel copy of the existing bridge; The existing moved down or upriver as a bike/pedestrian bridge; or sold abroad;
 - And potential commission additional or replacements of other end of life bridges and/or tunnels, pedestrian and cycle ones included.

Afterword

The above is not arguing for building altogether 55 miles of toll tunnels, but maybe half this, prioritising a few of the eight possible toll tunnels presented above.

London has since WW1 received a disproportionate share of central government funded public transport. There are endless arguments for this, but also endless arguments against this. There is only one other G20 nation that has done something similar, France.

What happens if London raises an equivalent amount of the Oslo toll revenue, €4-5 billion annually, proportional to inhabitants? Divided by four million households, that is over a thousand pound per household. Enough to build almost everything anyone could ever wish for in London.

But can London, Londoners and London businesses afford this? Possibly, yes. If the rich annually spend £1k less on add on's to their SUVs, £1k less on designer handbags and other accessories; £½k less on premium phones; The semi-rich half that annually.

An armageddon or a way forward? For all Londoners; The rich? The above average income? The middle income? The below average income? The low or no income? ■

Footnotes
* Van heights: Ford 2.5m; MB Sprinter 2.35m, Renault 2.3m; Vauxhall 2.25m, VW 2.3m;
** Stockholm attempts to build a 21 km full height western tunnel bypass, financed from a congestion cordon since 2007; has experienced endless delays and cost multiplications;
*** Greater Oslo: €½bn annual toll revenue, in an urban area of 1mn inhabitants
**** Minimum road and path widths were first defined in London in 1666

