

Light Rail (UK)

All Party Parliamentary Light Rail Group

House of Commons
London SW1A 0AA
Ref: LR Applrg Parliamentary Sponsors 2018



A pre DfT “Call for Evidence consultation” meeting

Chair: Wera Hobhouse MP, Chair APPLRG.

Tuesday 1800h – 2000h 23rd April 2019

Speakers

Paul Rowen, Chair LRTA

Councillor Roger Jones, Salford City Council

Gordon Pratt, Consultant, KenEx Tram Project

Councillor Mark Shelford, Bath and North East Somerset Council

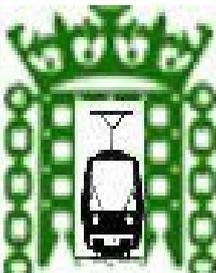
The Chair of APPLRG **Wera Hobhouse** opened the meeting and the attendees introduced themselves.

Paul Rowen, Chair LRTA

Paul Rowen congratulated Wera Hobhouse on becoming Chair of APPLRG and commented that the Group was having an impact with the report that it produced in 2010 now being cited by the DfT in their Call for Evidence document. Tim Kendell, LRTA Technical Director, is currently compiling the LRTA response to the Call for Evidence. It is essential that the response is evidence based

Why has Germany so many tram systems? 56 to our 8, France has 28 systems and the towns and cities where there are systems are often comparatively small. The Call for Evidence is an opportunity for us to make the case for places like Bath, Cambridge, Oxford and Warrington that should be benefiting from light rail. The LRTA formed in 1937 when cities in Britain were beginning to rip up their tram networks. The LRTA’s role has been to campaign for light rail because we think trams are good for the environment and for local people, bringing prosperity and jobs. Together with the APPLRG we have successfully lobbied for finance to modernise Blackpool, expansion in Manchester and the TramTrain pilot (which has now achieved 100% passenger satisfaction in the recent Tram Passenger Survey). We are currently supporting proposals in Bath, Blackpool and Cambridge for example.

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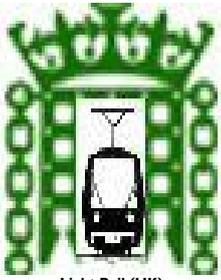
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What we must do in this Call for Evidence is press to get systems in some of our smaller cities. The overall number of people using trams is growing (over 260 million journeys p.a. over 8 systems), while bus passenger numbers continue to fall. Trams are shown in the Transport Focus passenger surveys to be more popular than buses or trains. The 8 systems are successful and are planning or implementing extensions, but we need to ensure that other towns and cities can get the advantages of trams.

Here are two major reasons why light rail is needed in the UK. The first is congestion. All UK cities have worse congestion than European cities. The average speed of a car in central London is now no faster than that of a Victorian horse-drawn vehicle and this is costing the economy billions of pounds a year. This is a compelling reason for trams to take many of the other vehicles off the road and allow people to move about their cities.

An even more compelling reason for switching to trams is air quality. The problem is not just tailpipe emissions but the “Oslo effect” – pollution from tyre, brake lining and road surface wear. Last year DEFRA call for evidence on non-tailpipe emissions. The report has been completed but not published and it is important that it should be released. Switching to a mode of transport which is electric and runs on steel wheels on steel rails is a much healthier option.

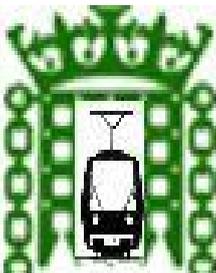
So LRTA continues its campaign for trams, including “third generation” systems, ultra light rail or very light rail, in order to bring the benefits of trams to cities and towns outside the great conurbations. We must put in a strong submission to DfT to say that we really do need more of these systems because they are better.

Comments

Mark Shelford said that government has been told repeatedly about the pollution problem; how are we to get them to take notice? No individual department will take responsibility. **Wera Hobhouse** said government is quick to point out the costs of acting against pollution and climate change but we never get the costs of not doing it. **Paul Rowen** said that we know the costs of health expenditure on respiratory problems. **Christopher Malton** said that the government does not understand that this was one ecosystem and that you cannot departmentalise it.

We need coordination between DfT, Defra and DoH. **Paul Rowen** referred to the APPLRG inquiry when all these aspects were covered. He referred to the DfT practice in evaluating schemes of marking down light rail for taking cars off the road and thus reducing the Treasury’s tax income.

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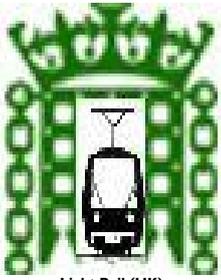
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Norman Baker when he was a transport minister managed to put a stop to that. Health costs will certainly figure prominently in the LRTA submission to the Call for Evidence.

Jim Harkins pointed out that it is relatively easy for government to impose standards on car manufacturers to reduce tailpipe pollution (at the car industry's expense) but they would be far less keen to force through changes in road surface composition to reduce the Oslo effect, as the roads are publically owned and all expense would fall on the public purse.

Tim Kendell said that in the LRTA submission to DfT on updating WEBTAG it was pointed out that the DfT's appraisal tool for new schemes does not adequately take pollution into account because of the lack of hard monetary figures.

Wera Hobhouse asked, in relation to the Bath proposals, what are the biggest barriers?

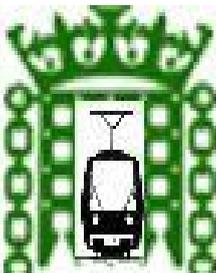
Mark Shelford replied that they are firstly financial – trams are very expensive to install but have a long payback period which is financially attractive to investors in the long term – and secondly planning – in Bath this is particularly the problem of the vaults under many of the roads and sharing road space. DfT is very squeamish about trams sharing road space with cars. One advantage of trams over a railway is that they can share space and there are plenty of examples of this being done successfully in Europe. The current DfT view is that tams should be segregated.

Paul Rowen referred to the report on last year's Defra Call for Evidence on non-tailpipe emissions which is not being released. It was agreed that an Fol was needed and that Wera Hobhouse should raise a question in the House.

Councillor Roger Jones, Salford City Council

Roger Jones explained that he is responsible for transport matters to the Mayor of Salford, Paul Dennett, and the Mayor of Greater Manchester, Andy Burnham. In Greater Manchester there is not a lot to complain about in that there are eight tram lines, 93 tam stops 43 million passengers per year, and we are currently building the Trafford park line which will be open in twelve months time, 120 trams with another 27 on order. That sounds pretty successful when compared with the UK as a whole, but we have had to fight every inch of the way to get to where we are now; none of it has come easily.

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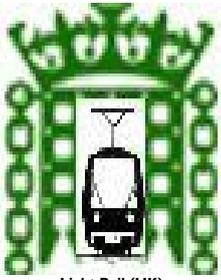
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Fifteen years ago when we were expecting tram expansion Alistair Darling announced that it had been cancelled due to increasing costs. We waged an all-party campaign, trades unions, CBI, Chamber of Commerce, press, media, television and any minister who came within 30 miles of Manchester was lobbied about it. The most important thing was that the public were 100% behind us; campaigning is easy with 100% public support. The trams belong to the public not to local authorities, not to the politicians. This popularity is the reason why you should want trams.

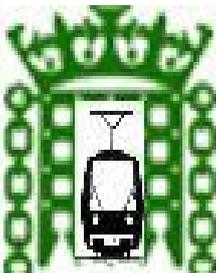
Currently Trafford Park is utter carnage as it is when any tram line is built. For thirty months there will be chaos and congestion with letters from the public saying they do not want it but the minute the tram opens 99% of the objections will disappear and the trams are loved by the people. So popularity is the number one reason for having trams.

A congestion charge was proposed in order to raise £3 billion to spend on public transport but a referendum in 2008 to bring this in was defeated by 3 or 4 to 1. In spite of this reverse, we had all the proposals costed and the local authorities and the government were able to put a deal together giving us a transport fund, albeit only half of what the congestion charge would have brought in and for once transport (normally hardly mentioned in national election campaigns) was at the top of the political agenda.

Air quality is also now well up on the political agenda and the trams tick every box.

Returning to finance, the reason that the costs were increasing so rapidly when Alistair Darling cancelled all those tram schemes was that all the risk was being put on the private sector. In France cities have a local transport tax on business so they only need to ask central government for 20-25% of the cost of a scheme. In this country it is almost the other way round with local authorities asking government to fund 80 or 90% because there is no local tax base which we can rely on.

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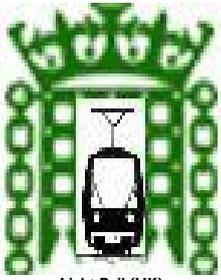
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Comments

Jim Harkins asked what the appetite was for expanding Metrolink to the west.

Roger Jones replied that there was a huge potential for expansion and a great demand. The three authorities without a tramline so far, Stockport, Wigan and Bolton, are keen to be added to the network and there are lots of areas of Greater Manchester and going west towards Warrington and Cheshire that have not yet been explored to a full extent. There are many schemes in the pipeline, but cost is the key issue unless new technology allows us to reduce that cost.

Wera Hobhouse asked if Manchester is stuck with the existing form of light rail or whether a lighter form would enable faster expansion.

Roger Jones replied that they will be looking at all the options for expansion.

Paul Rowen drew attention to the use of battery operation over part of the West Midland Edgbaston extension.

Ian Hamilton spoke of the potential of low-cost track systems. It needs someone to take it up and prove its feasibility.

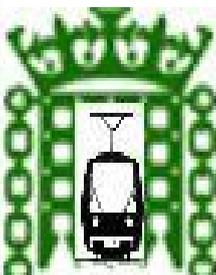
Tim Kendell warned of the “valley of death”, which is the inability of innovations to become accepted because no one will risk being the first to invest in them. There is also the problem of the “not invented here” attitude in this country. **Jim Harkins** spoke of ultra-light developments in Coventry and in other parts of the world which will provide a template for systems in cities like Bath.

Wera Hobhouse thought there is still a way to go in Bath before the majority of the population will be clamouring for trams.

Tim Kendell said that with many of the existing systems there has been limited public enthusiasm before the tram is installed but that changed radically once it is running.

Paul Rowen felt that installation of a lighter, wire-free tram will cause far fewer problems during construction than has been experienced with the existing systems.

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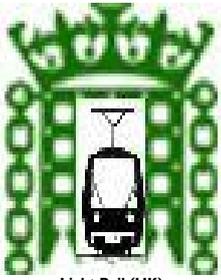
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Ian Hamilton felt that wire-free with batteries or on-board generation, coupled with a lighter track system is the way ahead. This could also form the basis of a new export industry for the UK.

Wera Hobhouse asked about private investment.

Tim Kendell replied that the Coventry scheme is financed indirectly by government, but

Jim Harkins said that there is a private backer behind the tram scheme for Warrington.

Mr Gordon Pratt Consultant KenEx Tram Project

Gordon Pratt gave an update on the proposed tramway to link South Essex and North Kent across the River Thames. The current link between the two is the Dartford Crossing which is a significant generator of pollution and is subject to massive congestion. This is a major barrier particularly to movement of labour between the two sides of the Thames.

With a population of two and a half million, the area already has a high population density, and this is increasing with substantial new housing developments. There is a definite need for improved connectivity between the two sides of the river.

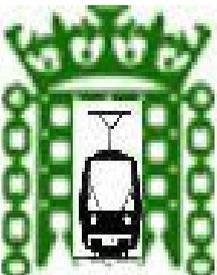
There are two major shopping centres, the Ebbsfleet International station and a proposed theme park, which will potentially generate another 35 million journeys. Because of the current lack of connectivity neither of the two areas is working effectively. By providing a reliable and sustainable public transport connection we can enhance the productivity of the whole area connecting people on one side of the river with jobs on the other.

Through the agglomeration effect the total effect will be greater than the current sum of the two parts and the effect will spread further up and down the river.

At present, although there is one bus route via the Dartford Crossing and a ferry, most people are forced to use cars to get from one side to the other. The bus route is successful and runs at a profit but is subject to the congestion on the Crossing. The tram scheme is supported by the two major bus operators on both sides. Arriva on the Kent side operates the Fastrack partially segregated busway which the tram will be able to share. This will increase the capacity of the route and we are working with Arriva to plan links to the bus network and possibly future feeder services to the tram.

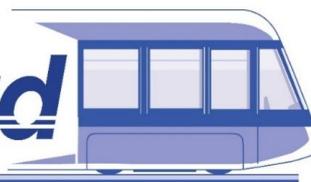
The tram will provide an alternative for car drivers, avoiding the congestion at the crossing, and will open up new opportunities for those without access to cars

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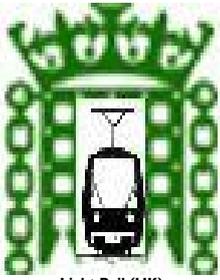
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The whole area is very much affected by traffic pollution both exhaust and non-exhaust emissions and the tram will help to remedy this by taking cars off the road system. The Thames Estuary 2050 Growth Commission's recent report called for public transport improvements for the area and saw the KenEx tram as a "quick win".

Government sees this as an important step in reducing pollution.

We are currently evaluating two routes, one on the south side of the river between Dartford and Gravesend and one north to south.

On the north side, we are currently working with a team at Thurrock Council to optimise the route there. Construction of the tunnel under the river is perfectly feasible and no major problems are anticipated. Following discussions with the Port of London Authority, an immersed tunnel is deemed the most appropriate solution.

There are many examples elsewhere of the use of this technology, including a 4-kilometre road/rail section of the Oresund link between Denmark and Sweden (delivered under budget and within time) and an 18-kilometre road/rail link, which is under construction between Denmark and Germany, both using this technology.

The sections of the tunnel are constructed on land – perhaps 12 sections for the 1.2km tunnel, floated out on the river, immersed and then covered over. This is much cheaper than a bored tunnel.

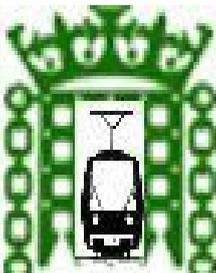
The current cost of the planned Lower Thames Road Crossing is estimated at £6.8 billion, which does not include the associated alterations to the existing road system. The total estimated cost of the KenEx tram including the tunnel is £600 million.

We have been in contact with a number of innovative transport projects around the world and are working with Southend College to develop training courses for tram planning, construction and operation.

Comments

Jim Harkins asked about the expected modal switch.

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Gordon Pratt said that it is difficult to predict as the inadequacy of existing public transport means that people are currently forced to use their cars. But, with the car journey taking 45-50 minutes against ten by tram, the modal switch may well be more than 20%.

Jim Harkins said that a switch of about 30% had been estimated for Metrolink and it is possible to calculate the weight of pollutants taken out of the atmosphere and put a monetary value on it. People are getting rid of their cars now the tram system is available.

Paul Rowen agreed that more people in Manchester are now not buying cars because of the high cost of running them and the availability of good public transport.

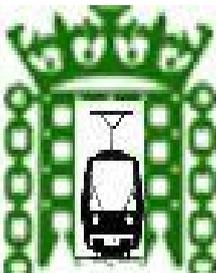
Jim Harkins said that the modal switch and the consequent reduction of pollution and of pollution-related deaths can be calculated and will provide an excellent campaigning point in discussions with local authorities.

There was a discussion about why trams are more successful than buses at attracting modal switch from cars.

Gordon Pratt said that Arriva are supportive of the KenEx tram because they know, from their experience of running trams elsewhere in the world, that the trams can provide greater capacity and an enhanced service.

The KenEx website is at <https://kenextransit.co.uk/>

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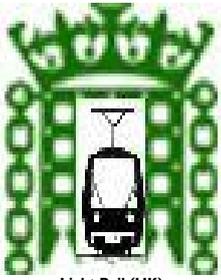
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Councillor, Mr Mark Shelford

Mark Shelford said he had ordered his presentation to answer the questions set in the DfT Call for Evidence. To set the context on Bath – it is part of a wider council area, Bath and North East Somerset (BANES), with a population of about 200,000, of which Bath itself is about 100,000. 70% of the remaining population is in the market towns around Bath: Radstock; Midsomer Norton. Next to Bath is Bristol with about 500,000, South Gloucestershire and North Somerset.

All these councils, with the exception of North Somerset, make up the West of England Combined Authority (WECA), which is the source of most of the infrastructure money.

The primary reason for wanting trams is environmental.

In the final BANES council meeting of the previous administration a Climate Emergency was declared jointly by the Conservatives and Liberal Democrats and we joined the Hundred Club, undertaking to become carbon neutral by 2030. Key to achieving this is transport, which currently accounts for 27% of all carbon within the UK carbon budget (rubbish 4%, agriculture 9%) and transport needs to be tackled first as it would be the biggest win in getting to carbon neutral.

Then there is the pollution issue, including non-tailpipe emissions. So the environment is the primary reason we in Bath are pushing for trams, which are carbon neutral and pollution-free at point of use.

The second reason is that trams are proven to break the log jam of congestion. Averaging the existing UK systems, trams bring about a 25% reduction in traffic. There is no other solution at the moment that can break congestion in this way.

The third reason is return on investment. We know it will be eye-wateringly expensive to bring trams in but we also know that there is a fixed return on investment which a lot of investors are pleased with.

We have to get through the “valley of death” and ensure that the ultra-light systems are proven and can be justified to the investors.

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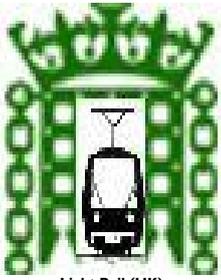
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Finally, there is the growth dividend which comes with tram systems. All around areas that have these systems there is growth. There is a significant return on investment and the Docklands Light Railway is a classic example of a quick payback from growth.

The majority of the Bath workforce comes from outside the city because people cannot afford to live there. If we make transport too expensive and difficult via an expensive, unreliable and insufficiently frequent bus service, then that workforce will be discouraged. There is also a lot of commuting between Bristol and Bath which the current rail service does not fully cater for and a new project funded by WECA is looking into tackling this.

These are the reasons we are pushing so hard for trams in Bath. Now for the DfT questions.

Q1 What is the potential scale of the opportunity for further light rail (or other rapid transit) systems to be introduced in England?

I have talk about two. The first is Bristol to Bath which has a serious amount of money behind it. The second is the internal Bath system which will start University to University via the city centre and the Cardinal Point park and ride. There is £450,000 from WECA for the next stage of the study (an initial study was done by Atkins which showed there were no “show stoppers” for trams). This new study will get us to the business case

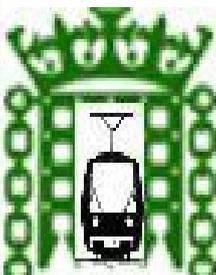
Q2 Is there an appetite for new systems to be introduced in our cities and towns?

The Bath Chronicle is inundated with letters from all types of people supporting trams, while there are few against. The main reason for being against trams is the cost and that the money could be better spent elsewhere. However, I think that this is the single most important thing in Bath from the perspective of climate emergency and congestion.

Q4 What would the environmental, economic and congestion benefits be?

This has been discussed. Taking an average across Croydon, Edinburgh and Manchester you get 25% reduction in congestion and 19% growth as well as the environmental and associated health benefits.

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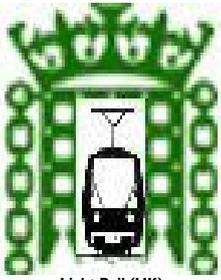
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Light Rail (UK)

All Party Parliamentary Light Rail Group

House of Commons
London SW1A 0AA
Ref: LR Applg Parliamentary Sponsors 2018



Q5 *What impact would it have on jobs?*

We know that people are put off working in Bath because of transport issues. Employers will set up outside bath where transport is better. Having a better transport infrastructure within Bath and the market towns would boost jobs significantly.

Q6 *Does light rail open up new housing or business developments or improve the urban fabric of the area?*

Lewis Lesley's book [*Light Rail Developers' Handbook, 2011*] quotes Croydon 10%, Manchester 12%, and Nottingham 15%.

[**Jim Harkins** pointed out that there is a more up to date report from UKTram which is available on the APPLRG website.]

Q7 *What can we learn from the experience of other countries in adopting new systems?*

We seem unable in the UK to learn lessons. There is no section within DfT to deliver new tram projects, no champions for trams that promoters can go to.

[**Paul Rowen** pointed out that this was what UKTram had been set up to do, although it was still developing].

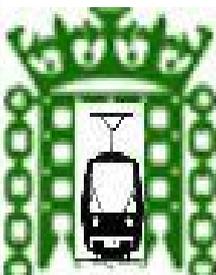
Things are much easier in countries like France and Germany because the local authorities have significantly greater powers than UK councils. However, we have to learn to work within the constraints of the UK systems.

[**Paul Rowen** pointed out the difference between Greater Manchester where the constituent local authorities worked together, and Merseyside where they did not.].

Q8 *What issues have helped progress light rail schemes or acted as barriers to their development?*

One barrier is the DfT squeamishness about shared space, which works perfectly well in other countries. Another problem is that transport projects are usually much longer-term than the local administration four-year cycle.

This meeting by invitation only, where MPs, Stakeholders etc. within the Light Rail industry and invited members of the Public will have a chance to discuss debate and raise questions concerning Light Rail & Trams.



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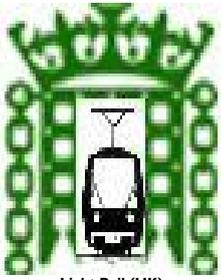
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Q10 *What are the key issues that are preventing light rail schemes from being delivered?*
I have already covered several of these: capital cost; planning regulations; road space; DfT squeamishness. The DfT project assessment model needs to be better balanced to give a level playing field for trams against roads.

[**Jim Harkins** mentioned the high feasibility charges levied by consultants as a barrier]

[Lack of time precluded Mark Shepherd from dealing with the remaining questions other than Q.16]

Q16 *Is there an appetite for considering Very/Ultra-light rail or Personal Rapid Transit as an alternative transport solution to light rail?*

For Bath this is critical. Without ultra-light there is no hope. If we have to move all the utilities and shore up all the vaults, then the tram will not happen.

Comments

Tim Kendell felt that Coventry is more promising than Preston, while

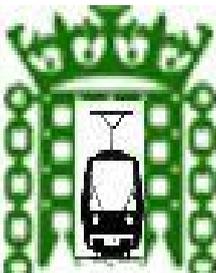
Paul Rowen referred to a number of lighter schemes already operating in the USA. Portland Streetcar and the San Francisco F line were specifically mentioned.

Tim Kendell said he is attending a conference at the end of the month at which he hopes to learn more of the light weight track being developed for the Coventry system. He pointed out that the problems associated with street track come not from the weight of the trams which was spread through the rails but from other road vehicles.

Mark Shelford quoted from Jesse Norman's introduction to the DfT's recent publication *The Future of Mobility*:

"We have an extraordinary opportunity here – to put Britain at the heart of the next mobility revolution, and bequeath a better, greener and more successful country for future generations. It's an opportunity that we are determined – with your help – to seize." He asked are we going to do it or not?

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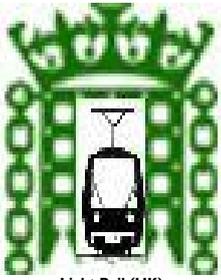
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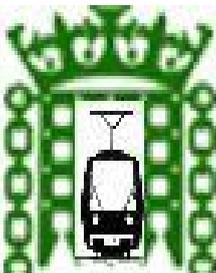


Tim Kendell thought that the officials in DfT were a major problem and we need the politicians to hold them to account.

Wera Hobhouse thanked everyone for attending the meeting and said she is looking forward to developments in the ultra-light field

Meeting finished 2025h

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TramForward



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Why Salford and Eccles District needs a Tram system

Light Rail (UK) believes that Salford and Eccles's congestion and serious transport air pollution can best be tackled by provision of high-quality public transport.

This is a serious opportunity in the proposed rebalancing of the North - South economy

This can be provided by TfN as part of the "Rail North" proposals and must include light rail and tramways, each mode providing optimal service for varying traffic flows. The essential requirement is full integration of modes, in terms of interchange and through ticketing, allowing seamless journeys into and within Salford and Eccles. Trams and light rail should form an essential component of our public transport provision especially connections in the East with Manchester Metrolink and eventually West to Cheshire and Liverpool City Region

We need our local politicians to be more Statesman like and be more proactive to secure Salford and Eccles's position as a central hub and future proof our transport links

Trams are an efficient way of moving large numbers of people in towns and cities from 150,000 citizens upwards and can cope with 2,000-18,000 passengers per hour. They have a proven record in attracting people out of cars; the rate of modal transfer from car to tram at peak times is typically around 27%.

This compares with estimates of between 4% and 6.5% for quality bus investment. Levels of traffic reduction from trams are typically around six times greater than with bus schemes.

Reductions of road traffic of up to 14% after introduction of tram schemes have been recorded.

A tramway will improve Salford and Eccles images and assists urban regeneration. Shiny rails instill investor confidence. All UK schemes have had positive effects on the image of the city in which they have been built, which has brought benefits in terms of attracting inward investment as well as business and tourist visitors, sometimes to the detriment of their non-tram neighbours

As part of an integrated public transport system, tramways can attract motorists out of their cars and thus reduce the number of vehicles in the city centre, particularly in conjunction with park and ride provision. This not only reduces the number of vehicles moving on the street but also reduces the demand for city centre parking. Conversion of heavily trafficked bus corridors to tram also reduces the numbers of buses, replacing them with fewer trams providing the same passenger-carrying capacity.

There is a confusion in the term used to describe Light Rail as the scope of this and operations are very wide, so I will use the term Light Rail in specific and the term Tram in general as the term Light Rail generally has now become polluted by the sub conscious thoughts of over engineering, over costs and general urban blight etc., where as the term

A Tram is more acceptable in human and affordable cost terms



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Light-rail transit, (LRT) or Trams, is a relative newcomer to the world of mass transit. Heavy rail and subways take a long time to build and they're expensive to operate.

This is a mode of transport which uses rail vehicles which are more versatile than conventional "heavy rail" trains and have street running capabilities. A light rail vehicle can negotiate sharper curves than a conventional train (both vertical and horizontal), can negotiate steeper gradients and can stop much faster so can operate in line of sight mode without major signaling requirements.

The systems available provide the ability to follow the curves and gradients of the urban environment which a conventional train cannot do. Light Rail systems offer an attractive and effective system, reducing congestion and pollution by offering motorists an alternative to car use, Manchester Metrolink registered a modal switch approaching 32%, helping to create pollution-free zones in cities (clear zones).

It moves large passenger flows in a more cost-effective way than buses, but at a fraction of the cost of a full urban railway. Light rail/tram is mainly appropriate in urban or inter-urban systems in medium-sized cities where full metro systems are inappropriate.

In the largest cities underground/metro systems tend to be the mainstay of public transport but such cities might use a light rail solution to supplement the metro system.

Light Rail vehicles provide the ambience of a train but can run in places where a train cannot. They are thus able to attract motorists out of cars where a bus would not be successful. Even when running on former rail alignments, light rail vehicles can offer a better service because they can offer a more frequent service. They can stop at more places because the stops are much easier and cheaper to construct than railway stations. On roads as trams, they can offer attractive journey times in comparisons with cars and buses by taking advantage of segregated alignments and the latest traffic engineering techniques to avoid road congestion.

A frequent light rail/tram service provides security in city streets throughout the day, both on and off the vehicle. Low-floors together with a spacious layout provide easy access to mainstream public transport for everyone including parents with buggies and disabled people using wheelchairs.

Trams are generally electric vehicles which produce no pollution at the point of service delivery, may use locally produced "green" electricity and the visible path makes sharing precincts with pedestrians a safe option. Thus, pedestrian precincts with trams can provide access to city centre areas where buses and cars would be obtrusive.

A significant part of the success of any system is the demonstration that changing people's life styles away from the car and its choking consequences and can be of considerable benefit to them and their surroundings

In some situations, where conventional tramway systems are not appropriate, intermediate light rail can be considered.

There are several former and lightly used lines in the Salford and Eccles, that should be included in the Rail North plan taking advantage of developed low cost construction and vehicles



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Intermediate light rail vehicles can be a TramTrain which can run on main line railways but have some of the characteristics of light rail vehicles. Typically, they would have (in the UK) a floor height of 950 mm to give level access on standard Railtrack platforms and the flexibility for street level platform, magnetic track brakes and balancing, capable of running on line of sight, inter-working with conventional trains and frees up capacity at main stations

This would enable them to run on non-segregated alignments providing better access in places where the railway route is not near to the destination of passengers and where it would be difficult or prohibitively expensive to construct a conventional railway.

In the meantime, LRT technology has made great advances. It's clean, relatively quiet, and is quicker to build than heavy rail systems, for example Manchester Metrolink Airport Line which came in significantly under budget and a year early

TramTrain has the potential to provide a new passenger to rail, a better transport offering whilst reducing overall costs to UK plc, development of a new service to rail users, providing new journey opportunities, taking the railway to where people want it to go to both origin & destinations, providing easier access to trains, in effect taking the railways to the people again. May have higher upfront costs but deliver lower whole-life costs.

Substantial evidence from Europe shows that this develops into a significant revenue streams and enhances the modal switch from road to rail in the urban area, but will only be delivered if the wider industry work in partnership to make it happen

Examples in the UK are:

Greater Manchester with plans for TramTrain in the Stockport/Marple area, Birmingham, Glasgow, Edinburgh, Liverpool, Leeds, London, Bristol, Cheshire, Cardiff Bay development but to name a few who are almost TramTrain ready

Liverpool were ill advised and lost this option when they sold for scrap the high quality new tram rails originally to provide this option for Mersey Rail

A recent development in light rail/tram is the growth of on-board fuel supplied vehicles giving catenary free vehicles powered by hydrogen fuel cells.

Foshan, a city of some eight million in southern China, has rolled out the first of what will be many trams powered by hydrogen. When they enter service, each will carry up to 380 passengers, have a range of 100 km, and a top speed of 70 km/h. Refueling it will take just three minutes. Hydrogen fuel cells generate electricity by creating a chemical reaction using hydrogen and oxygen. That means their exhaust is nothing but water.

The trams are manufactured by Sifang, a subsidiary of state-owned China South Rail Corp.

If the new trams turn out as planned, China plans to spend US\$ 32 billion in the next five years to build and equip 2,000 km of lines.



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At the other end of the scale, several relatively low-cost hydrogen trams have been developed in service. One successful hydrogen tram is operating in Aruba linking the Port with the capital city Oranjestad



An example of a low-cost hydrogen tram in the tourist role, there are standard type vehicles with this manufacture.

A scheme using this technology has been proposed for Dundee

Air pollution has been linked to coronary artery disease, heart attacks and strokes, with studies showing that traffic-related air pollution affects lung function in children and older people. Sixteen cities and regions including London, Manchester, Salford and Eccles, Leeds, Birmingham and Glasgow have illegal levels of air pollution long after they were obliged to comply with agreed limits

Hydrogen cars no overhead required, running in Doha Qatar Dec 2018



A significant source of low cost Hydrogen is available locally in the Cheshire area



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[Wednesday 6 August 2014 16.55](#)

[Photograph: Peter Macdiarmid/Getty Images](#)

Particulates are one of the worst offenders in air pollution because they damage the lungs when inhaled. Stand at a busy road junction on a bright day and chances are you will see it: A Wacky Races cloud of black smoke left hanging in the air after a car pulls away. These clouds are actually particles of soot – partially burnt fuel from diesel engines – and they are arguably the worst environmental menace facing Salford and Eccles, children and senior citizens in particular.

Particulates are one of the worst offenders in air pollution because

"Exposure to air pollution affects the health of everyone, especially children, and those living with pre-existing lung conditions. Developing and implementing a coherent strategy for reducing air pollution is therefore essential if we are to clean up our dirty air and protect the health of us all."

Air pollution causes 29,000 early deaths a year in the UK, more than obesity and alcohol combined

A look back at the costs in 1999/2000 to the NHS (when these figures in this format were last readily available) there were over 10,500 operations for respiratory disease.



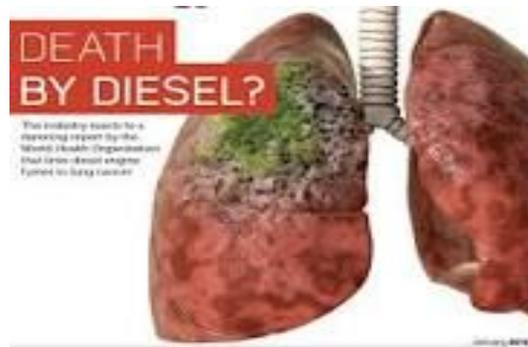
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The total cost of respiratory disease to the NHS 1999/2000 £2,576 million made up of Primary Care for respiratory disease across the UK costs £647.5, hospital inpatient care costs £1,062.2 million, hospital day case care costs £18.2 million, outpatient care costs £40.7 million, 2,800,000 bed days per year used for treatment alone. In 1999 alone, respiratory disease caused 153,000 deaths (74,000 men and 79,000 women) production losses due to respiratory disease £3,194 million, mortality £1,643.6 million morbidity, working days lost 28,309,000 multiplied by the average daily earnings produces an estimated £2,239 million pound



The Government must take immediate action to tackle high levels of nitrogen dioxide (NO₂) pollution in the UK following a landmark court ruling.

Supreme Court justices announced the verdict today and said ministers must draw up new air quality plans to meet obligations under European law on pollution limits.

A panel of five judges, headed by the court's president Lord Neuberger, ordered "that the Government must prepare and consult on new air quality plans for submission to the European Commission, no later than December 31, 2015

The Secretary of State "admits in this case the UK has failed to comply with the nitrogen dioxide limits first laid down by EU law in 1999, now contained in Article 13 of the directive". A DEFRA report from 2014 has lain unheeded until this court case

Some areas such as London, Birmingham Glasgow, Edinburgh, Dundee, Aberdeen, Liverpool, Bristol Salford and Eccles and Leeds will not meet pollution limits until 2030, 20 years after the original deadline of 2010.



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The "Green bus solution", an oxymoron may be electric and therefore "Green" the wearing out of the road surface, the dust from brake lining and the microscopic dust created by tyre wear produces a greater combination of heavy metals in the PM2.5 pollution, an extremely lethal combination over and above any tail pipe emissions in the urban area

By forcing the Government to urgently clean up pollution from/and including diesel vehicles, by implementing as France has done light rail and tramway systems which are emission free and can use energy from non-polluting means of power generation.

All governments have tried to sell us the low cost options of more efficient roads, cars, buses and trucks etc., but the evidence shows that these do not work on the scale now needed and this is a fatal path for many that they are taking and whilst it appears that lip service is paid to saving the planet etc., a step change with this new Government now that the facts are in the public domain has morally to do this to reduce the illness and death of hard working families, our very young and to enable our older citizens to enjoy considerable healthy, happy longevity

The "Oslo Effect" is produced by the road surface, tyres and brake linings which is now emerging as the "elephant" in the room. A toxic cloud composed of predominately heavy metal dust, one in particular "Magnetite" recent research is showing a significant contribution to Alzheimer's Disease, Dementia and other related types of mental illness



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Light rail usage increased in 2017/18. Passenger journeys and vehicle miles reached the highest figures recorded in the modern, continuing two decades of growth without any direct operational subsidies unlike that a significant number of bottom end Train Operating Companies enjoy now

The trams that ate Melbourne

Tram patronage is on the up and up, and plans are afoot to put jumbo trams into action to handle the growth



14.59 metres

W-Class (1920s-1950s)



23.5 metres

B-Class (1980s-1990s)



32.52 metres

C2 Bumblebees (2000s)



33.42 metres

E-Class (2010s) **32.52m**



Next generation

45 metres



Ten Toyota Corollas

Graphic: Jamie Brown



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Across the 8 light rail systems in England there were 262 million passenger journeys in 2017/18, a 7% increase on the previous year.

The rising passenger journeys and vehicle miles can at least in part be attributed to network expansion, for example route miles on the Manchester Metrolink increased by 15% from 2016/17 to 2017/18.

Light rail and tram revenue increased by 6% in real terms to £290 million in 2013/14 compared to 2012/13. Average revenue per journey has increased 4.6 pence (3.8%) in real terms to 128 pence between 2012/13 and 2013/14

We need our local politicians at Parliamentary and our Council to press for a change in the Cost Benefit Ratio to enable funding to become available for Trams for Salford and Eccles

A simple method of doing this is to change the DfT measurement tool Cost Benefit Ratio from the short number of years (12/20yrs) to something to reflect the generational benefits of Light Rail to 60 years + and be imaginative to capture many of the soft benefits as is done on many continental countries and then we can be a one nation enjoying our movements and health together and not one at the expense of the other

A recent report launched by UKTram at the summer meeting of the All Party Parliamentary Light Rail Group shows the significantly higher regeneration and jobs created in the 8 city regions in UK with this mode which will power the rebalancing and growth of the economy

We have the money; local experts and this nasty nettle must be grasped and a statesman's view over several generation funding is needed and we will go a very long way to cleaning up and regenerating our cities



James Harkins FCILT MTPS
Managing Director
Light Rail (UK)
A not for profit Company
September 2018

ps



"the clean and green way to link Kent and Essex"



Linking Thurrock & Kent

KENEX Tram – providing the environmentally sound, efficient solution fit for the 21st Century..

A project supported by:



www.kenextram.co.uk

April 2019



"Transforming the environment and economies of the Thames Gateway."



“the clean and green way to link Kent and Essex”

The case



- Roads in area often gridlocked
- Congestion compromising bus services
- Levels of pollution seriously affecting health
- Local connectivity across the Thames often disrupted
- An area with high population density
- Disconnect of people from employment opportunities
- New and substantial developments to be accommodated

Need for congestion-busting, clean, community linking, Thames Crossing opportunity

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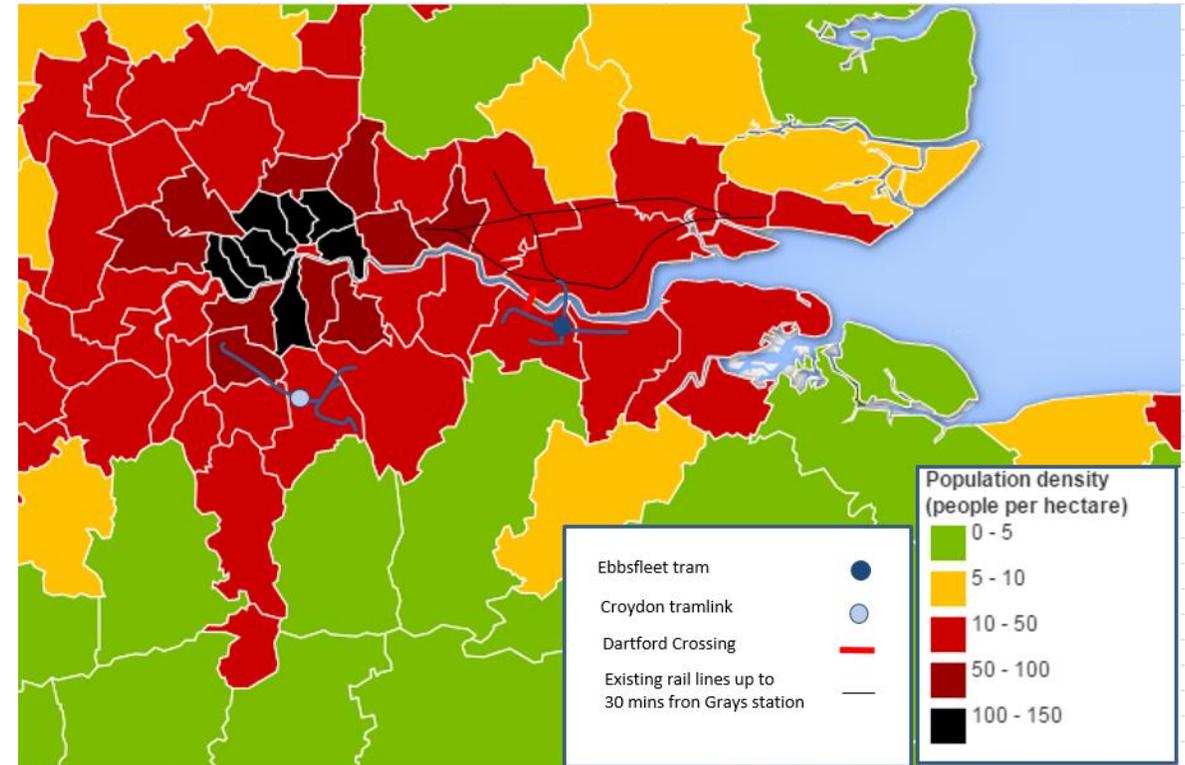
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Potential high load factors

- 1 million Kent Thameside population and 1.4 million Essex Thameside population within 45 minutes of Ebbsfleet with **KENEX** creating a catchment equivalent to a city
- Estimated total annual journeys (all transport modes)
Bluewater - 58m , Ebbsfleet Intl. - 5m Intu Lakeside - 53 m
- Annual Dartford Road Crossing in excess of **50 million** journeys
- Potential additional journeys with the proposed London resort



Population density 2010 Courtesy of The Guardian

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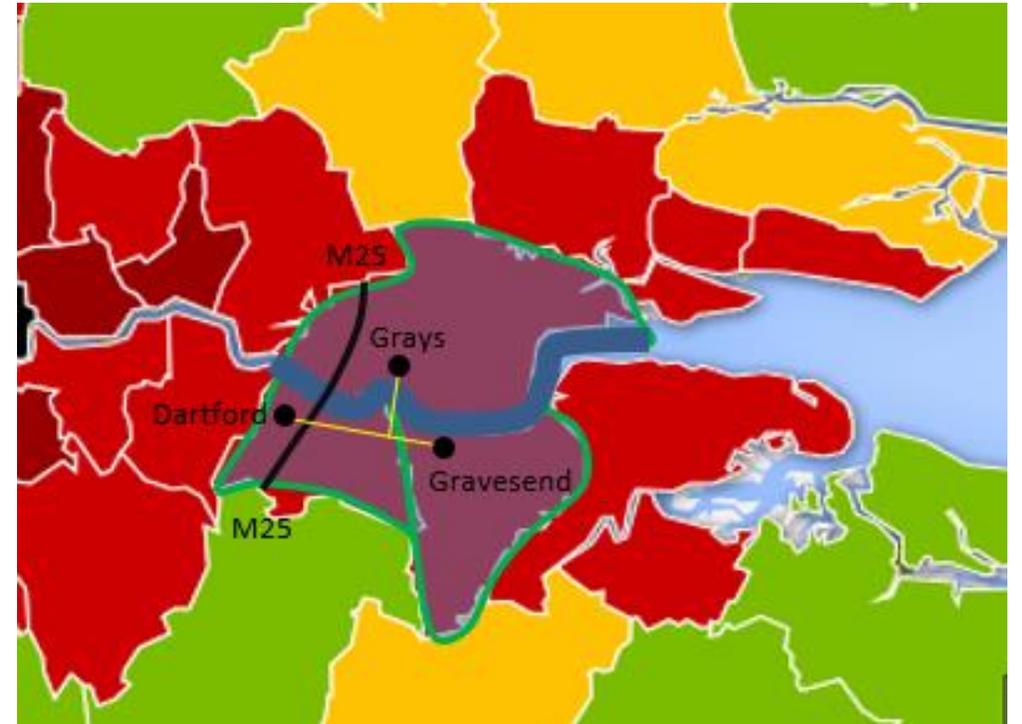
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Agglomeration benefits

Key areas benefitting from agglomeration effect and economic enhancement of **KENEX** tram link:

Thurrock – Dartford - Gravesham

... the benefit further extends along existing rail corridors both sides of the Thames



Population density 2010 Courtesy of The Guardian

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Existing Dartford Crossing has high level of local usage

The Dartford Crossing being a road only crossing and not integrated with public transport, includes a very high local car usage. **Local** journeys amount to around **30%** out of an annual crossing level of more than **50 million** journeys many of which would be removed by the **KENEX** tram.

Elsewhere where integrated transport solutions are adopted catering for the non car driving market it is possible to see a usage split. For example the number of people using the Øresund Link is split roughly 60% road and 40% rail.

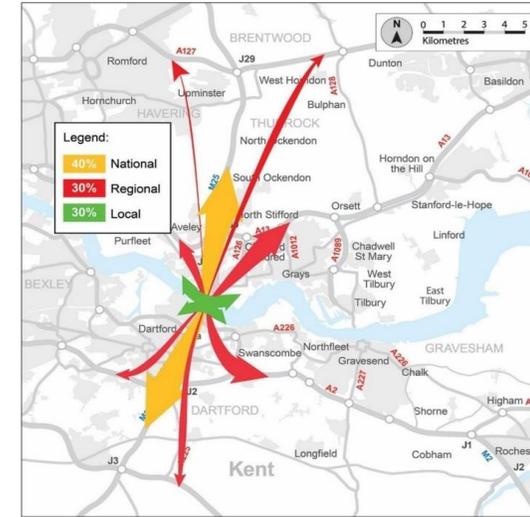


FIGURE 3.5 - EXISTING USE OF DARTFORD CROSSING

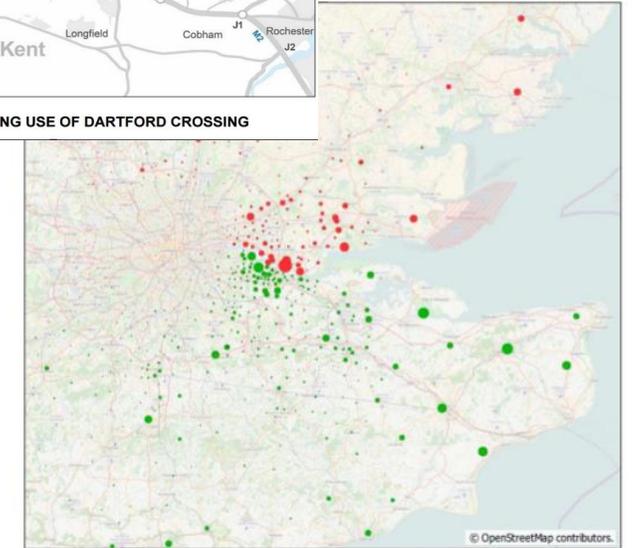


FIGURE 3.6 - ORIGINS AND DESTINATIONS OF DARTFORD CROSSING USERS

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Highways England –
Lower Thames Road Crossing Scheme assessment report

April 2019



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Reduction of pollution levels - DEFRA

“Particulate emissions from non-exhaust sources are a result of the friction required for braking and maintaining traction on the road, which are essential for road safety. However, these particles are harmful to human health and the environment – and a source of microplastics in our oceans.”

DEFRA – Government Clean Air Strategy January 2019

There are examples of lower emission alternatives in use on the rail network, for example, in Birmingham there are light rail and tram alternatives which are helping to improve local air quality

DEFRA – Government Clean Air Strategy January 2019



The **KENEX** area is significantly affected by harmful non-exhaust emissions and for which the **KENEX** tram is an effective solution.

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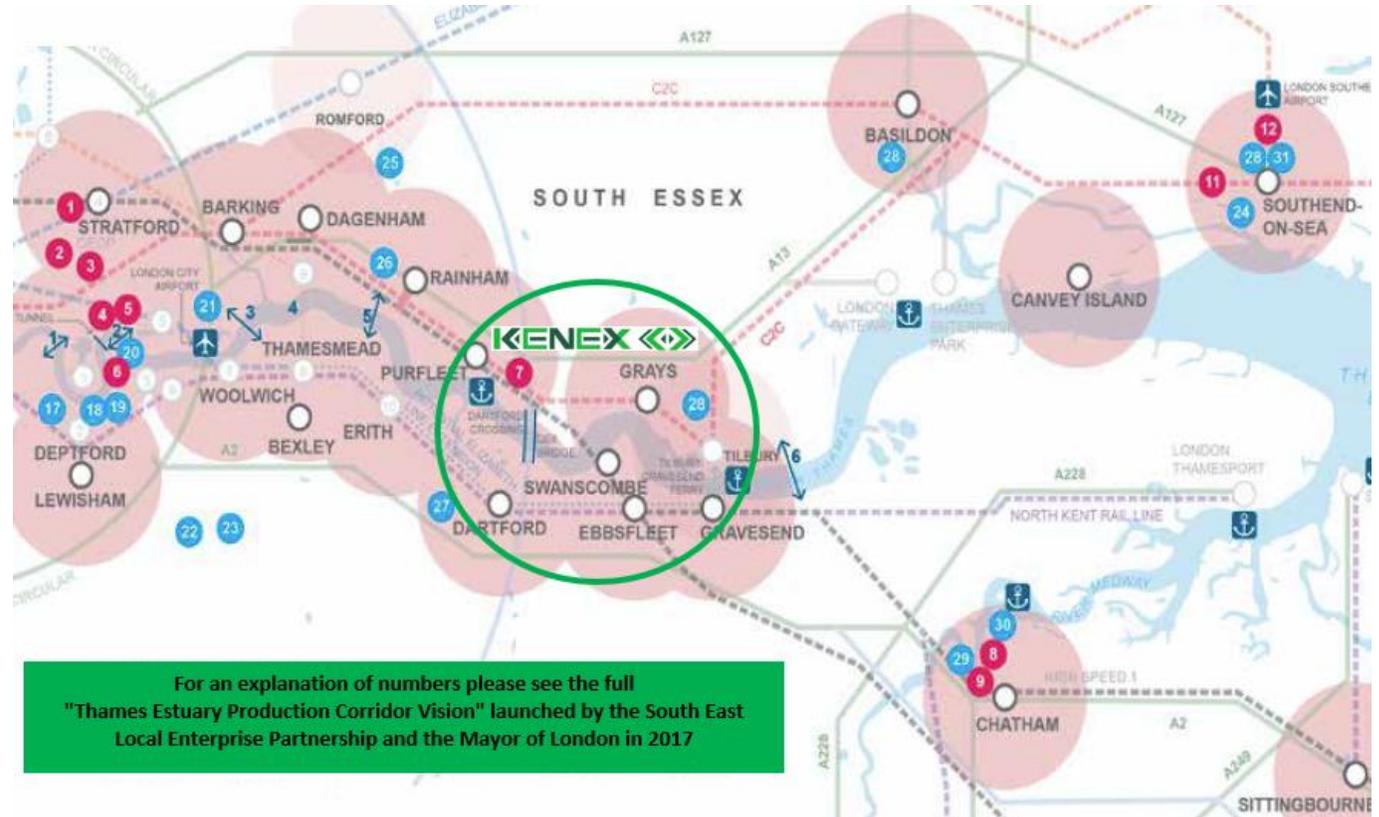
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“the clean and green way to link Kent and Essex”

Providing modern sustainable transport at the heart of the “Thames Estuary Production Corridor”

*Located in the Production Corridor, the **KENEX** tram proposal is key to allowing connectivity and efficient movement for non car drivers*



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Thames Estuary 2050 Growth Commission View

The Growth Commission acknowledges the high levels of local congestion and significant air quality issues hindering economic activity and causing issues for the health of the local population.

*The Commission called for a “Transport Innovation Zone” and saw this as a “Quick win”. The **KENEX** tram proposal is the available solution.*

The Government response in March 2019 regarding the Transport Innovation Zone includes the comment “... will help deliver clean growth and highlights the government’s determination to address air pollution and climate change. We are keen to work with local partners in the Estuary as they take forward any proposals in this area.”

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Transport Innovation Zone



What: Create a Transport Innovation Zone which promotes clean technology in transportation, logistics and data systems and unlocks housing opportunities with new means of public transport.

Why: The area forms part of the national road network for freight movements, and has a high density of tech and digital logistic usage. Also, due to the volume of traffic using its crossings and associated congestion, it suffers from significant air quality issues.

2050 Vision – Growth Commission

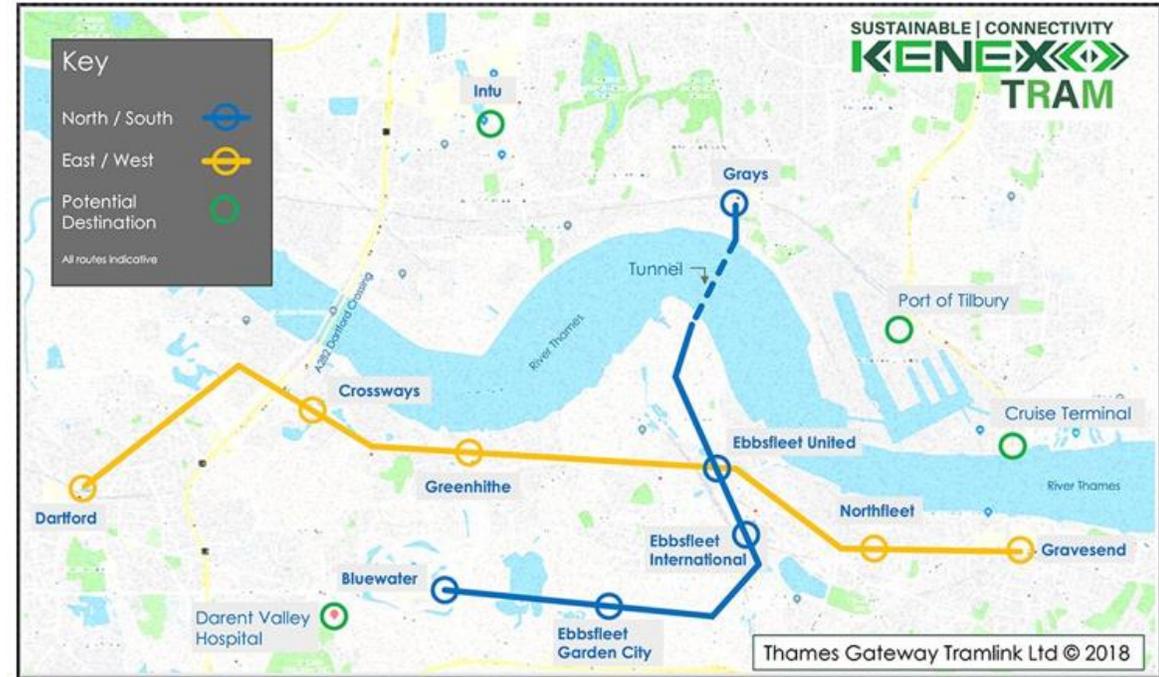
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Options currently being evaluated

The KENEX indicative routes are as shown and we are in discussions to further refine our routes. Our key target is the provision of inclusive, sustainable transport unlocking homes and economic opportunities in Thurrock and North Kent.



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Immersed tunnel

In countries such as the US, Japan and the Netherlands the immersed tunnel technique is quite mature and common practice. The proposed 1.2km, $\frac{3}{4}$ mile **KENEX** tunnel uses this technology.

Recent examples include the 4km Drogden road/rail tunnel part of the Øresund Link between Denmark and Sweden completed in 2000 and the 18km Fehmarn road/rail link between Germany and Denmark currently under construction.

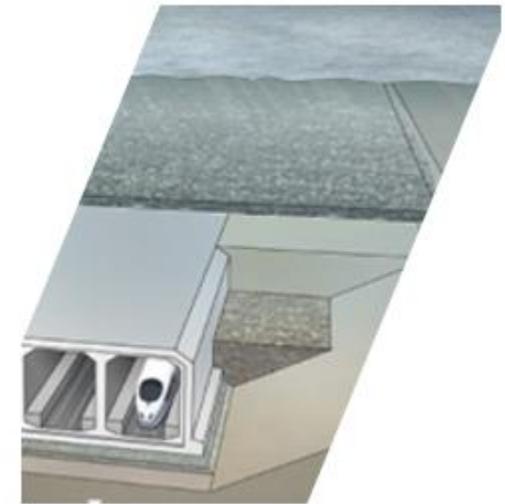


Image from the Fehmarn tunnel currently under construction illustrating the 2 track rail section

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Costs

The cost of the proposed Lower Thames (**Road**) Crossing is estimated by the **Highways Agency at £4.4 to £6.2 billion**. We understand that there has, as yet, been no provision for non car drivers or public transport integration.

Feasibility work to date and a study based on previous similar projects indicates a total cost of the **KENEX Tram** project of around **£600 million** including a Kent-Essex immersed twin tunnel solution.

The project therefore provides a considerably better Benefit to Cost ratio than the Lower Thames Road Crossing as a result of which, serious interest has been shown from investors seeking a long term sustainable project. **KENEX** is expected to be a privately funded project.

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Dartford Crossing



Istanbul

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A modern sustainable transport supporting modern technology zones around the world



OPTICS VALLEY

Wuhan, China



MALAGA VALLEY

Andalucia, Spain



Next opportunity "Ebbsfleet Valley" Thames Gateway, England?

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***KENEX Thames Transit –
An environmentally sound, efficient
solution fit for the 21st Century.***

***“This is a highly congested area
already and it’s going to get
worse with all the development
planned. This exciting new
project is really the golden
solution to that problem.”***



***Baroness Randerson.
Transport spokesperson
House of Lords (Liberal
Democrat) March 2018***



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