TramForward

APPLRG 26 April 2017 DAGIBLIN

Slide 1. Trams Clean Air-Cities, Towns & Garden Villages

Introduction:

The topics we'll be discussing here today range from public health and air pollution, to increased mobility, city design and quality of life in the UK, rethinking public infrastructure to encourage the public away from their cars and into reliable, low-pollution public transport.The 'Trams for Clean Air' mission is to help the UK in all these areas.

I'll cover some keys statistics, of course,

but I'll concentrate on the big picture and the positive impact that trams can have on individuals' lives and the UK environment, its infrastructure and the advancement of Public Health.

The LRTA believes that Government and local Authorities together need to assess the root conflicts between Economics and the Environment, focussed on the public interest. They should prioritise Clean Air and environmental protection within economic growth to best serve overall national public heath and protect the freedom and right of people to breathe healthy clean air.

We need clean air to live healthily. We must have the courage of our convictions to safeguard people from environmental dangers.

According to the World Health Organisation, seven million deaths globally every year result from air

pollution. Clean air should *not* only be for the fortunate who can experience it elsewhere.

European Directives over the last 30 years, aimed at control of Pollution have resulted in avoiding 80,000 early deaths and also avoiding health costs of around 1.4% of GDP. Freedom to breathe clean air is something to be defended, no one can afford to be complacent about it.

Increasingly, air quality has moved up the political agenda through campaigners repeatedly challenging the status quo. The disaffection of the public on this matter (is of increasing concern and must be addressed) should be listened to for the health of adults and children alike.this is a real issue for constituents in urban districts across the UK.

The LRTA proposes immediately to bring together influencers and decision makers for and against, centrally and regionally in

for and against, centrally and regionally in the UK to a roundtable to develop short, medium and long-term plans for 'Trams for Clean Air'. The aim is to find common ground on which to work together on achieving key aims for quality Clean Air and Trams contributing to those aims.

SLIDE 2. Clean Air. What Crisis?

Air Pollution: Public health issue

Air pollution has proven links to Public Health problems of coronary, artery and respiratory disease and strokes, with studies showing that traffic-related pollution can seriously affect lung function, particularly in both children and older people. It is estimated that there are up to 40000 UK deaths p.a. in respect to Lung, Asthma and Heart diseases

resulting from pollution effects.
Source: Royal Colleges of Physicians and of Paediatrics and Child Health.

Carbon dioxide- climate change issue:
Climate change includes global warming and everything that increases greenhouse gas levels. In London legal limits of Nitrogen Dioxide were exceeded during the first 5 days of January.

Significant amounts of nitrogen oxides from transport come from diesel-powered vehicles.It is well understood that diesel vehicles emit more pollutants than petrol models, an estimate by the Royal College of Physicians put the cost to the economy over £20bn to a year.

Awareness:
The Public is becoming increasingly aware of pollution and that road traffic is responsible for much of the emissions, Oil fuelled transportation is a major contributor to pollution problems in this

contributor to pollution problems in this country, resulting in respiratory problems and others.

Clearly there needs to be effective consultation and bridge building to minimise division between those who are supporters of clean air and opponents who restrict further moves, including industries which currently rely on high pollution output in standard operations or, in the worst cases, which wish to circumvent regulations.

Oslo Effect:
Particulate Matter (PM) from rubber wheeled tyres/road wear causes up to 90% of harmful PM2.5 and 85% of PM10A pollution which comes from non-exhaust sources such as tyre wear, road surface wear and brakes. This is known as the Oslo effect after the city where it was first established.

There is a clear distinction between

pollution caused by tailpipe emissions which can be tackled by changing the method of propulsion of rubber-tyred vehicles, and that caused by tyre/road wear, which can't. Electric cars can be up to 40% heavier so even more of these harmful particles are emitted from the tyres.

Breaches of EC Limits: The European Commission has started action against the UK for non achievement of Clean Air targets and given a final warning to 16 UK areas for breach of legal limits, which may result in referral to the European Court of Justice. The Commission warned that while the UK was still a EU member "European law applies fully". The UK Parliamentary Environmental Audit Committee stated a new Environmental Protection Act would be required so that air pollution standards were not reduced due to Brexit.

Statute, Sanctions:
The Clean Air Act of 1956 dealt with the Smog of the 50s, the Clean Air Act of '68 strengthened legislation through implementing control areas and the '93 Act implemented regulations and smoke control orders, with the Environment Act 1995 requiring Local Authorities to achieve air quality objectives.

For this century, development of the Government Policy paper 2010-15 needs actioning with a keen eye on the final goal.Conflicts between industry, which is rightly focussed on profit, and Clean Air requirements need to be resolved through Laws and regulations to serve the UK population's interest.

New Clean Air Act :
A RECENT YouGov survey showed that 65% of the of the British Public support a new Clean Air Act most saying current levels of air pollution in UK have an adverse effect on health, and two thirds

adverse effect on health, and two thirds back Laws to deal with the problem.

The next steps the country takes on Clean Air may have an irreversible health impact on much of the population of UK towns and cities.The Government should implement a new Clean Air Act. Clean Air policies need to be understood and incorporated into Policy at the heart of Government in order for the UK to make a success of this opportunity.

Now is the right time (pre-Brexit) to demonstrate global leadership on Clean Air and the Government can exercise its powers to advance Clean Air as a key Environmental policy and also as a measure to attract global investment and create UK jobs.

Action plans and KPIs:
The Government *is* committed to improving UK air quality and plans are consistently under review, with more that

£2 billion committed since 2011 to encourage purchase of of ultra low emissions vehicles and support environmentally friendly transport schemes.

There needs to be demonstrable evidence that businesses (and car users) are upgrading to less polluting vehicles, switching to low pollutant public transport options where possible.

Current Air Quality sustainability Policies and Strategies presented must be measured and targets achieved.The good intent must be implemented through in depth policies to validate performance.

Stakeholder involvement:
Stakeholders in Clean Air need to make more progress, to make changes happen which have the capacity, depth and reach, requiring industries and business to change attitudes and behaviours to achieve goals of neutralising the effects

of poor air.This is why local governments must have the capability to action their autonomous rights given to them by voters.
LRTA will continue to engage with others including the international community, to seek a political solution to achieve 'Trams for Clean Air' whilst continuing to lobby and campaign along with pressure groups to engage the groundswell of public opinion for change in the UK.

Examples of recent developments :

- Friends Of The Earth air pollution campaigners said: "Air pollution is responsible for tens of thousands of early deaths every year and is harming the health of an entire generation of children.

- A New diesel car scrappage scheme will be targeted by postcode at the most polluted areas under plans being

considered by Government Ministers. The London Mayor, S Khan, along with campaigners and MPS demanded Ministers bring in a nationally funded diesel scrappage scheme with a scheme to help business and car owners upgrade to less polluting vehicle.

- Environmental law firm ClientEarth has won cases in the Supreme Court and High Court which requires the Government to produce stronger measures to bring down illegal levels of pollution.

- In Reading, Berks, the council has implemented Industrial regulation and permitting under Pollution Control legislation, with an Air Quality Management Area (AQMA) declared on all main arterial roads to/from Reading centre.

There can be no let up, the gains so far need to be extended through greater effort to include demands to adhere to existing laws, to contain breaches and put pressure on industries such as car manufacturers seeking to find ways around implementing EU aims of reducing CO2 emissions resulting in non adherence to laws and standards.Cities and Towns need to get more powers and resources to tackle pollution.

SLIDE 3. TRAMS. UK and Europe

Comparison:
There are 265 active tram systems in European countries, Germany alone has 55.

In 2000, 25 different tram projects across the UK were proposed by the Government, so far 8 are operational.

There are 21 completely new tram systems opening by 2017 in such places as Luxembourg, Denmark, USA and Algeria.

Examples: current upcoming tram developments in UK:

- There are possibilities to open a test line in Preston.

- Cardiff, Derby, Glasgow and Oxford are seriously considering new tram developments.

- Politicians are well advanced in considering a tram system to secure Warrington's position as a central hub and future proof its transport links.

- Southampton and Portsmouth should be linked with a hi-tech tram system.proposed tram line could be built alongside the main heavy rail line between Southampton and Portsmouth, an alternative to the M27 for getting between the two cities, part of the ongoing Solent devolution for large financial investment and funding

.

- Bournemouth has Tram potential

Passenger Requirements:
Passengers today want a modern tram system, clean and efficient, state of the art, air-conditioned, low-floor trams.

Tram systems bring great benefits to a city.

Mobility and Connectivity:
Tram fleets add more capacity per driver than BTR or bus and can change people's life styles away from the car.

They can be quick to build, capeD costs are now becoming lower as a result of standardised carriages, stations and depots with rolling stock lasting over 30 years.

Pollution free: trams have a Low Carbon footprint

Trams are the most carbon efficient mode of motorised travel. Trams, being powered by electricity are largely pollution free in service delivery, have zero on-street carbon emissions, resulting in an improvement in air quality, avoiding both the tailpipe pollution of the internal combustion engine as well as the particulate pollution generated by wear of tyres and road surface. The carbon footprint is also lower than other modes, particularly if they are powered by electricity generated by renewables.

Trams are a zero-emission form of transport, not polluting and in an integrated transport strategy alongside

integrated transport strategy alongside other modes such as buses, taxis, cycling, pedestrianisation pollution impact and traffic congestion can be reduced.

Example:

- Nottingham has seen a reduction in carbon emissions since 2005, according to data released by the city council.Trams in Nottingham are one factor in air pollution reduction in the city, according to the city council

Attract Passengers from cars:
The most important task will be to provide such reliable trams services that the public will choose not to use their car.

Trams tackle the issues of clean air and climate change.Generally, public transport produces lower emissions per passenger journey than an equivalent journey by car.

As part of an integrated public transport

As part of an integrated public transport system, trams attract motorists out of their cars and thus reduce the number of vehicles in the city centre, linked park and ride provision. Trams can also replace buses on heavy ridership bus routes with fewer trams creating greater overall capacity.

Reduce traffic congestion:
Trams can transport around 2,000-18,000 passengers per hour with the goal of attracting travellers from cars with a target of 20% modal shift per hour from car to tram at peak periods as compared to bus investment which achieves around 5%.

Traffic reduction from trams is six times greater than with bus systems. Road traffic reductions of up to 14% after introduction of tram schemes have been monitored.The UK capacity of the road system is insufficient to accommodate the extra traffic, and pollution, already in many places above limits, will get worse

many places above limits, will get worse.

Trams are relatively straight forward to insert into city and town centres in comparison to other systems, with Trams' capacity and frequency can resulting in large numbers of people being moved.

Regeneration:
Trams add value to the the environment in cities and towns and support urban regeneration. 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.

Property values, both commercial and residential, benefit from the introduction of trams and tram schemes can encourage regeneration of run-down urban areas. Trams crucially improve connectivity between residential areas,

including deprived areas, enhance job opportunities and give better access to communities and shopping. Commercial partnership for advertising and sponsorship also benefit.

Building tram systems before heavy rail build will support emerging regeneration e.g. implement tram systems before and in support of HS2 and HS3 construction.

Technology:
Each new generation of trams brings more state of the art technology into Tram design for improved engineering,operations, and maintenance.

However there is some way to go to achieve the standards of only now are trams developing technology used in other customer minded industries.

LRTA has commenced work on a white paper on technology and ticketing which

paper on technology and ticketing which we are researching further and will released this year seeking to advance ways to achieve increased accuracy in customer information such as on trams times as well as apps for tickets, timetables, system disruption information,with a single log-in to multiple operators websites. This will aim to provide passengers up to the minute information during their journey to enable an ordered and logical approach to changing between modes for example. Passenger data analysis efficiently used by operators can predict and optimise system and route performance to maximise capacity and tram running and deliver the service standard sold to customers.

Design solutions:
Designed with a quite small geographic footprint of up to 3metres Trams move large numbers of users on systems in each direction saving space and not

monopolising traffic routes.

- Tram-trains are commonplace on the continent, these are an intermediate type of rail vehicle, based on a modified tram which runs on its own tram tracks, also running on conventional mainline railway lines. Substituting trams for trains would start an innovative shift in the direction for rail transport.

- The new onboard hydrogen fuel cells offer an enhanced emissions-free option to traction power with catenary-free operation.

- ‘Feeding via the ground’, Alimentation Par le Sol (APS) is a modern third-rail electrical pick-up power supply Tram mode in use in Bordeaux.

- Intelligent Mobility, the Catapult Wheelmotor

- Parry People Movers

- Think Small. A new ultra light rail vehicle is being designed for a rail service between Dudley and Sandwell alongside the new National Centre for Development of Very Light Rail Technology.

- Trams have regenerative braking which means energy can be used that would otherwise have been wasted.

SLIDE 4. Tram Funding. Expensive luxury?

Can Afford! :
Some UK Authorities see trams as an expensive luxury and do not consider trams as an option, put off by perceived Tram over-engineering and possible cost overruns,they see Tram investment as expensive, also referring to continental Tram system cost levels being less expensive than in the UK. Others seek to transfer risks to the private sector, so the tram system price goes up.

Capital expenditure costs can be kept low by standardising carriages, stations and maintenance depots while high upfront investment in rolling stock is justified by length of service for tram carriages, an estimated 30 years.

Existing Tram services proven around the UK have reduced car traffic, increased property values and generally improved people's quality of life.

Management:

The *benefits* which come from the costs and investments must be more clearly understood and explained to decision makers including how cost can controlled, through good Management: *Make* the Tram business manageable, affordable and profitable.

Economies of scale:
Tram networks are adaptable and can deliver economies of scale. Bulk buy standard fleets and infrastructure through combined business plans for councils.

In business case preparation, Tram fleets can add more capacity per driver than BTR or bus, so wage costs are proportionately lower.Trams offer better energy efficiency per passenger kilometre compared to cars or buses.

Tram Economies include labour and power costs lower, all of which allows a payback on investment.Trams have comparable energy efficiency to metros

comparable energy efficiency to metros without the expenses of escalators or lifts or tunnels, cooling fans.

Risk Transfer:

Government provides revenue funding for buses and trains, but not for trams. Trams need Government funding to be built, and also to provide funding for the cost of running trams.

The Government is averse to trams investment denoting risk in expenditures. Government requires local authorities to sponsor buses, considered less expensive.Politicians should begin to support the benefits of Trams within an integrated transport approach.

Tram projects are funded through Private Finance Initiatives resulting in the private sector having the risk of DBOM , for a 30-year period, therefore bids for tram schemes are high.

Both Public and private sectors are cautious about Tram investments and risks, as initially low passenger numbers forecast and farebox returns based on existing buses for example may not provide the returns required, these come later, so investment needs preferably to be joint public and private investment.

It is time to rethink. To deal with the risk levels Government should consider alternative ways of funding trams and take on more of the risk of these projects.

Borrowing:
Government can borrow at cheaper rates, refinancing on completion of the Tram system build.Once the project has been completed, the infrastructure becomes the security against which to borrow at lower rates of interest. A private promoter can existing new tram system as a commercial venture to create a profitable business

business.

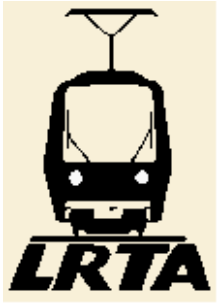
Funding Trials:
Government should co-operate in funding trials into financing alternatives to bring down further the cost of building trams.

Department for Transport Cost Benefit Ratio:
Measurement tool. Change from the short 12-20-year period to something that better reflects the 50-year-plus generational benefits of light rail.

Intermediate Rail vehicles:
Highly cost effective trams solutions can be created through procuring slimmed down trams systems, using different technologies such as Tram-trains and other tram options.

New turnkey offers:
Construct tracks and provide trams in a single package.Drive down costs continuously do not over-engineer.

continuously do not over-engineer.



SLIDE 5. Trams. Funding Investment

Change Management:
LRTA is investigating a 'change management' approach to funding to assess and seek and help create new enabling financial models, benchmarking best practice funding models for future use.

LRTA's aim is to help Government and Local authorities to establish and fund effective Tram systems, not identifying a single approach, but presenting technical and funding options for discussion and implementation of new schemes. The approach is focused on providing

information that can be used to make informed decisions, adapted to local policy objectives.

Financial Models:
PFI is expensive. By modifying the approach using leading edge business models and dealing with land uplift, long term bonds can be secured against land value along with co-ordinated funding from different sources of finance,within a structure where at the moment Government is enthusiastic about fixed price contracts to pass risk to contractors.

The validity of light rail solutions is a matter of financial viability and is dependent on physical routes, passenger volumes and funding.

The Government assesses the benefits of transport schemes through an appraisal process which makes it difficult to get

approval and funding for a new Tram scheme. Government guidance makes it hard for Transport Authorities to introduce a Tram system preferring to encourage the build of road or bus schemes.

Example:

In May 2009, the former Greater Manchester Integrated Transport Authority and the Association of Greater Manchester Authorities (AGMA) established the £1.5 billion Greater Manchester Transport Fund. Transport for Greater Manchester is responsible for delivering the public transport projects covered by the investment programme. The European Investment Bank (EIB) agreed to give £500m as a long-term loan to Manchester's tram scheme to further expand the network with new trams and infrastructure.

Investment:

LRTA will consider opportunities in respect to investment, through filling the funding gaps, providing appraisal and guidance support in respect to;

- Neighbourhood Community Land Trusts
- Local Infrastructure Funding Trusts
- Land Values Rating
- Public Works Loans Board
- Municipal Investment Corporation Bonds
- New Towns Act, long term loans,
- Community Infrastructure Levy
- Land values funding, long term so no subsidy,
- Short term guarantees and loans, New Homes bonus repayments,Build to Rent schemes and, Affordable housing,private rented sector debt guarantees-
- Tax, improve the way property (buildings and land) is taxed
- Development corporations role in build Garden Towns funding local

build Garden Towns,funding local infrastructure from development values
- National Infrastructure Commission

LRTA will review Government regulations processes to support effective decision making in Tram business planning regarding income generation and how economic instruments are used.

SLIDE 6: Garden Villages. Their impact

LRTA will seek to ensure all potential Tram options are evaluated within local master plans for delivery options, gathering data and evidence for Tram and Clean Air planning, in both immediate and long term future garden villages decisions.

decisions.

Garden Village/Town status means Authorities are able to apply for more money from the government to support planning these new communities, of which LRTA seeks serious tram evaluation to be a part.Trams can be a sound solution for garden villages and towns as part of a plan for integrated intermodal services.

SLIDE 7. Garden Villages. Location, location, location:

Highlights:

- Bristol-Bath tram system, a light rail system on the A4 between Bristol and Bath. approaches area, options for rail

should be explored or alternatively a tram train using the mineral line, which is largely still in existence and maintained.

- South Derby integrated transport link, new station at Stenson on the Burton-Derby line
- Stakeholders need to drive the Devon Metro project forward and secure the necessary funding as it has widespread public support
- Essex North.Review the East Colchester Rapid Transit Option appraisal regarding BRT being the chosen as most cost effective approach and flexible in delivery, rather than a light rail / tram system.
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SLIDE 8. Garden Villages. 'The Ask'

Participation:
Regarding transport planning for the Garden Villages, Public Participation, which is more than just consultation, should aim to create positive enthusiasm amongst local people to secure their support and avoid disputes regarding schemes designs, or mandated directives from dominant command levels.

LRTA will build on the positive groundswell of opinion towards Tram through participation in Public debates/ hearings, interviews with local people, reviews of opinion polls, all leading to disclosure of findings and political lobbying for Tram investment.

Self Sustaining small communities:
40% of UK local authorities have not adopted local sustainability plans and reports. (CLG select committee report Dec 14).
Neighbourhoods and residents need to be capable of developing and sustaining

be capable of developing and sustaining change to achieve their community's own, long term interests and sustain its individuality, so local people need the freedom to be independent and and enabled in order to get their requirements approved and endorsed.

Transport Plan:

Garden Village planners can learn from the vast experience available to them to implement bespoke Tram systems to meet their specific requirements flexibly.

Some research shows that Trams can be cheaper versus bus in integrated intermodal services for villages and towns where tram passenger ridership justifies investment , providing exceptionally good value for taxpayers, Trams are perfect match for design into garden villages to avoid future car grid lock in such circumstances.

LRTA will encourage each authority to

strategise its transport plan and assess capacity, the environment and impact on people, as well as the benefits achieved from the costs incurred.

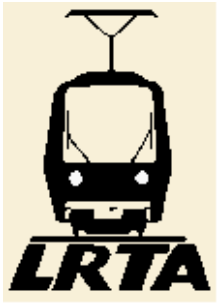
Stakeholder Engagement:
LRTA will work with communities to advise in the development of stakeholders Plans and issues logs for identifying on ongoing actions required to bring Trams to the fore.

Governance Boards:
These should be selected by Local Authorities for Community oversight of compliance with legislation in regard to their Transport plans, considering a Tram policy statement and commitment to sustainability as a core value within spatial development plans.

Joint-Venture Delivery Vehicle.
In developing new tram schemes there is need for clear and in depth project

need for clear and in depth project specification and contract overview, management, risk transfer, funding and participants assessment.

Environmental policy objectives:
Continual improvement of the environmental management systems is a key objective for allauthorities, there is a need to create inventories of local Greenhouse Gas potential emissions and impacts under various proposed transport plan options being promoted.



SLIDE 9. Oxford Metro. LRTA/URBED Workshop

Individually and jointly LRTA and URBED are working with transport, finance, property experts, Oxfordshire Futures

Group, to show how funding ideas could be applied in Oxford, following through till all the aims are achieved.

A recent press survey in Oxford asked 'Should Oxford get its own Tram?' 93% responded 'YES'.

2 half-day workshops are being sponsored by the URBED Trust and the Light Rail Transit Association, as start-up of an ongoing funding acceleration process.Roundtable sessions will discuss and report back on how to overcome the obstacles including:

- Technical issues
- Financial issues
- Organisation and delivery
- Community engagement

Assess possible local improvements in Oxford: aim to achieve an advantageous tram system and free up rail capacity.

Informed Group:
Insight and advice will be sought from invited experts and potential funders.The workshop will bring together stakeholders in Central Oxfordshire with an invited range of national experts to discuss the next steps in raising a long-term bond of £350 million, as Cambridge University has done.

Funding and Procurement:
The Bond to be used to build the Oxford Metro, starting with the SpineLine to run services through Oxford Station to Cowley and and possibly beyond, also to redevelop Oxford Central Station as a 21st century transport hub.

There will be a review the proposed Varsity Line joining up Oxford with Milton Keynes and potentially Cambridge, which is a national infrastructure initiative.

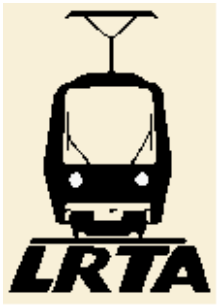
A number of financial solutions are

opening up, including the use of New Town Development Corporation powers to assemble land and to borrow low cost funds from the Treasury.

Blueprint funding prospectus: Defining projects and the requirements for successful bidding through community and local authorities who design and implement services together.

Attract Global Funders: There is much interest from around the world in funding trams in the UK, including investors from China, India, USA to name but 3 areas.

Demonstrate high returns: There is a need to focus not just on the cost of a project but on the return on investment. For each new system demonstrate how it can produce a much higher return on investment than bus rapid transit/buses, by for example, attracting new private developments around the line.



SLIDE 10. Oxford Metro. Workshop planned output

We will deliver an outline financial Prospectus:
Sections;

- Introduction and Purpose of the Prospectus, what is to be funded, cost of detailed preparation, framework
- Executive summary: Vision, Policy, Strategy and Mission
- Masterplan approach.Route, Schematic of project,Ridership,Land value, Construction costs, Ownership, Planning permissions,
- Pre-feasibility outline Business case criteria, requirements and assessment for viability, then comprehensive

Business Plan development

- Investment Plan concept: demonstrate benefits and financial returns,
- Financial Plan methodology: funding availability fit/international, then release of funds, equity, loan, grant, guarantee
- Funding Submission: legal and regulatory compliance guidance, repayments
- Public Consultation/Secretary of State:preparation and approach
- Procurement: requirements and selection process
- Design, Build,Operations and Maintenance: Finances and budgets

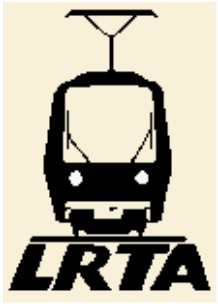
Summing up

There are major Clean Air issues to be resolved. Peopledemand with hearts and minds the right to have Clean Air Laws. Trams contribute the technical tools to help achieve long term Clean Air solutions.

LRTA will work together and build momentum with all organisations to find common ground and agree solutions to help ensure Public requirements are met.

Let's have the willpower to strive and make our brand-new Britain an advanced economy which is also a global leader in Clean Air where Trams are part of the integrated transport systems of our cities, towns and villages to attract people to live there healthily and encourage businesses to follow.

That's the way forward, 'By Tram for Clean Air'.



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