Light Rail (UK)

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Light Rail (UK) is a not for profit organisation promoting sustainable Public Transport predominately steel on steel in the Public Highway and consists of Light Rail Consultants, Transport Engineer, Politicians, Academics, Environmentalists and Others

We are commercial specialists in low cost, affordable & sustainable tramways and provide a Secretariat Service to the All-Party Parliamentary Light Rail Group www.applrguk.co.uk and are responding to this call for evidence as Light Rail (UK)

Unfortunately for trams it appears to be the case that many adopted local transport authority plans have mode share targets which are often both not very good in the first place as well as now out of date and in need of revision. A very simple example is that if there is an ambitious target to increase bus use to achieve a mode shift to public transport then trams may not be considered because the bus target and highways targets are consuming all the budget of the transport department. Trams are then not considered because there is no budget for them and because there is no assumed target or commitment, or staff expertise, to increase rail based public transport mode share.

We see that the key problem; dominance by excessive private car travel which causes significant pollution, a threat to global health, the health of the planet, a threat to public health, poor air quality in and near travel corridors, inefficient travel patterns and discourages healthy, active travel by cycling and walking.
There are solutions; alternatives to mass car travel to deal with these problems are improved bus services; a partial solution as urban buses has a similar *NEE value to HGVs; introduction of a tram network supplemented by substantially improved bus services; integrated transport system with the Tram as Core & Spine

(*NEE, Non Exhaust Emissions, high in carbons, micro plastics and fine particulates Defra Jul 2019.)

Buses as feeders then upgraded to a tram route where appropriate.

CONGESTION

Increases fuel consumption and air pollution - traffic jams, stop-start at busy junctions.
Increases journey times, cars - economic cost of unproductive time behind the wheel especially during journeys to work. Provision of parking space expensive and inefficient use of land
Pavement parking, a hazard for pedestrians, blind and disabled, pushchairs, prams etc.,
Clog up a city's arteries! Socially selfish use/allocation of road space
Significant illness, loss of production and multiple deaths particularly amongst the young old and those with underlying health issues

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ROAD NETWORK INVESTMENT?

Build new roads and widen existing roads to increase network capacity? this has been done since the mechanisation of vehicles and has not worked, there is no more land being made!

Electric cars on improved road networks will reduce carbon & tail-pipe emissions per journey but increases exponentially the Non-Exhaust Emissions *(NEE)

*NEE is produced by all rubber tyred vehicles/road interface abrasions which contain extremely toxic pollutions such as fine particulates 2.5 PM > and a significant number of Micro Plastics.
Road generated Micro Plastics pollutants second only to that created by the Clothing Industry.
Affects roadside buildings inside up to 25 miles, Road Dust Suspension and downwind plume not included in Government pollution figures.
Reduction in car journey times is relatively short lived - conventional road network improvement increases car use and inefficient travel patterns.

A busy road with 25,000 vehicles travelling on it each day will generate around nine kilograms of tyre dust/particulates/micro plastics alone per kilometre.
We cannot build our way out of these problems, the solution is modal switch out of the habit of excessive use of cars by better, sustainable public transport, steel on steel where possible.

Investment in modernizing the Urban bus fleet as an interim measure.

Electrically powered buses will reduce Co2 emissions and tail pipe emission substantially.
Buses have a very low modal switch and statistical since 1962, are a failing mode.

Non-Exhaust Emissions (NEE) from a bus is on par with a LGV and is above the minimum safe level as published by Transport Scotland. However, according to WHO, there is no safe minimum level!

The working life of a city bus is generally between 8 – 13 years before scrapping, modern continental tram systems are celebrating 140 years +

Buses should be an interim mode (pending tramline construction, where appropriate) and as feeders into the core tram corridor
E-Buses need electricity from renewable sources and various options exist and can be shared with trams. Creating bus priority routes will improve the reliability and frequency of bus services and make buses more attractive for car user and fore runners of possible tram routes later.
Low modal switch, the highest figure is circa 9% with a very intense frequency which was not sustainable due to the high number of vehicles required and other bus congestion issues.
Limited applicability in the form of busways with a maximum of 7000-8000 passengers per hours

NEE pollution will continue to rise and kill unabated.

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WHY SHOULD WE INVEST IN 'STEEL ON STEEL' TRAM SERVICES?

There is no alternative to having a 21st century integrated, accessible, and sustainable public transport system with a tram network as a major component - needed to deal with pollution, congestion and inefficient travel patterns and encourage active, healthy travel.

The modal switch is significantly higher e.g. Manchester Metrolink 2018 carried 67.6 Million passengers with a modal switch of 27%, a big number for only 120 vehicles.

Bring more measurable benefits to passengers including cleaner air, improved connectivity, regeneration, employment opportunities etc.,
Achieving wider economic and social objectives of regeneration,
employment, inclusion, and accessibility in the communities served with tram rails.
Tram stops generates linear growth rather than station only growth as experienced with Underground, Heavy Metros and Classic Rail
Trams can take the rails more cheaply (VFM) than underground or classic railways especially to new P+R sites adjacent to Motorways and have a greater passenger catchment.
Active travel is encouraged by the general nearness of tram stops enables penetration into the retail/city centre/entertainment facilities. Tram stops can provide where suitable Bike + Ride facilities.
Evidence shows that retail foot fall can increase by 36% (Kassel) and develops the night-time economy and lengthens the retail availability in the High Street, good examples can be found in Manchester and Nottingham.
Contributes to a reduction in drink related car accidents.

Helps reduce "Transport Poverty" e.g., unreliable bus services drive fixed income passengers on to taxis and eventually into unaffordable car ownership.
Increases the street scene ambience especially in pedestrianised areas such as street cafes, planters etc.,
Ensuring that all steel-on-steel rail especially street running contributes to a sustainable development across the common transport corridors.
Be fully accessible to all residents and visitors including those with reduced mobility to all Tram and shared Bus stops, Public Transport Pathways (PTP) Be mindful that we have an ageing population, and the network will be fully accessible, easy to understand and use. Successfully supply the last/first mile door to door connectivity from Park + Ride sites
A Political Statement of Permanence (Political money where your mouth is!)
A demonstration of Inward Investment. A belief in the Greater "City" Area
Provide a greater service frequency i.e., 4-8 trams per hour,
Improve non car access and connectivity to the Transport Corridors. Relieve pressure on the "Road corridors" thus providing significant savings.

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MORE ROADS ARE NOT THE ANSWER

After seventy years + of road building what is clear to most observers is that we cannot build more roads just for rubber wheeled vehicles to get us out of the scenario where we are today, the proposed RIS2 needs to address the significant threat now facing us in the form of Climate Change and with a little step change in thinking, who uses the roads and funding, the principles of Decarbonising Transport, with a vision for how a net zero transport system will benefit us all.

Public urban transport and active travel will be the natural first choice for our daily activities. We will use our cars less and be able to rely on a convenient, cost-effective, and coherent public transport network with some of our proposals being almost oven ready small-town starter trams.

Each time a tyre rotates, it loses a layer of rubber about a billionth of a metre thick.

This works out to about four million million, million carbon atoms lost with each rotation.

A busy road with 25,000 vehicles travelling on it each day will generate around nine kilograms of tyre dust alone per kilometre.

Vehicle tyres, brakes, air suspensions and road surface wear are now bigger contributor to particulate matter (PM's) in the air than vehicle exhaust systems.

NEE PM10 have increased from 29% in 2000 to 73% in 2016, (2.75% per annum)

NEE PM2.5 have increased from 26% in 2000 to 60% in 2016 (2.125% per annum)

NEE PMs Road Dust Suspension and downwind plume not included.

Affects roadside buildings inside up to 25 miles.

There are no minimum safe amounts.

Data from the UK national Atmospheric Emissions Inventory (NAEI)

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Extract from Defra NEE Report July 2019

mg PM_{10} / km	Road abrasion
Cars	7.5
LGVs	7.5
HGVs	38.0
Buses	38.0
Motorcycles	3.0

153,000 respiratory deaths,
mainly young & old *British Thoracic Report*
Figures show between 25% - 40% of deaths due to "Tail Pipe emissions".
(38,250 – 61,100 deaths) UK Government

mg PM_{10} / km		Tyre	Brake
Cars	Urban	8.7	11.7
	Rural	6.8	5.5
	Motorway	5.8	1.4
LGVs	Urban	13.8	18.2
	Rural	10.7	8.6
	Motorway	9.2	2.1
Rigid HGVs	Urban	20.7	51.0
	Rural	17.4	27.1
	Motorway	14.0	8.4
Artic HGVs	Urban	47.1	51.0
	Rural	38.2	27.1
	Motorway	31.5	8.4
Buses	Urban	21.2	53.6
	Rural	17.4	27.1
	Motorway	14.0	8.4
Motorcycles	Urban	3.7	5.8
	Rural	2.9	2.8
	Motorway	2.5	0.7

"Oslo Effect" To burn carbon and road grind is to pollute. Is this where it will all ends?

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Because of the high dust detritus with animal transport, many first-generation tramways had a nocturnal "Water Tram". This washed away the suspension material created into the sewers Part of a Public Health Program. This is a low-cost option today of reducing the NEE issue especially if road sharing with buses.

No tail pipe emissions, clean at the point of use, reduces the immediate pollution

Reduces death on the pavement, No "Oslo Effect."Year on year savings to health costs

Release funding for other health projects etc., Increases the ambience of the city streets

Improves liveability of the immediate & surrounding area

*Improving air quality is estimated to provide a £7 million benefit to the local economy

*Fewer premature deaths 60 deaths. *Fewer sickness days almost 16,000 days

* Extract from CBI Economic: Breathing Life into the UK Economy. Bristol Sept 2020

Attracts 26% + retail plus footfalls

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What can they do for Growth & Regeneration?

Tram systems does increase the amount of development in an area and makes the linear development much more effective.

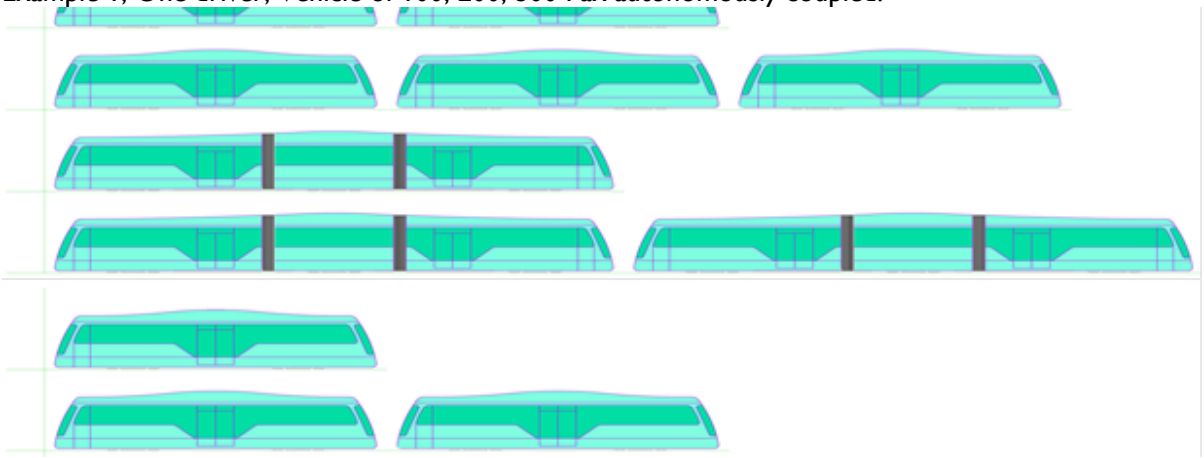
We have identified areas that the Tram Project will open up and access land

Areas along the line of route lend themselves to high density housing,

offering a mix of commercial and residential uses.

Gives developers the chance to build efficiently with fewer parking spaces needed.

Example 1, One driver, Vehicle of 100, 200, 300 Pax autonomously coupled.



Example 2 of one driver Vehicle of 200, 400 coupled articulated vehicle scalable Tram Size.

Non-mechanical vehicle coupling at the push of a button. Trams can be sized to reflect demands during Peak and Off-Peak hours. Reduces excessive driver costs, eliminates deadheading empty seats.

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How can this be paid for?
Supporting public transport undertakings or operators by enabling legislation for the transport undertaking to claim Carbon Credits either by the number of passengers carried or based on the modal switch from less polluting modes. A post pandemic base line may be a good starting point.

Carbon credits are market mechanisms for the minimization of greenhouse gases emission. Governments or regulatory authorities set the caps on greenhouse gas emissions. For some companies, the immediate reduction of the emission is not economically viable. Therefore, they can purchase carbon credits to comply with the emission cap. Companies that achieve the carbon offsets (reducing the emissions of greenhouse gases) are usually rewarded with additional carbon credits. The sale of credit surpluses may be used to subsidize future projects for the reduction of emissions.

The introduction of such credits was ratified in the Kyoto Protocol. The Paris Agreement validates the application of carbon credits and sets the provisions for the further facilitation of the carbon credits markets.

Many businesses find they cannot fully eliminate their emissions, or even lessen them as quickly as they might like. The challenge is especially tough for organisations that aim to achieve net-zero emissions, which means removing as much greenhouse gas from the air as they put into it. For many, it will be necessary to use carbon credits to offset emissions they cannot get rid of by other means.

Carbon prices have already been implemented in 40 countries and 20 cities and regions. According to a 2019 World Bank report on trends in carbon pricing, a carbon price range of US$40-80 is necessary by 2020 to reach the goals set by the 2015 Paris Agreement.

The Taskforce on Scaling Voluntary Carbon Markets (TSVCM), sponsored by the Institute of International Finance (IIF), estimates that demand for carbon credits could increase by a factor of 15 or more by 2030 and by a factor of up to 100 by 2050. Overall, the market for carbon credits could be worth upward of $50 billion in 2030.
Currently Carbon Credits

The market for carbon credits purchased voluntarily (rather than for compliance purposes) is important for other reasons, too. Voluntary carbon credits direct private financing to climate-action projects that would not otherwise get off the ground.

These projects can have additional benefits such as biodiversity protection, pollution prevention, public-health improvements, and job creation. Carbon credits also support investment into the innovation required to lower the cost of emerging climate technologies. And scaled-up voluntary carbon markets would facilitate the mobilization of capital to the Global South, where there is the most potential for economical nature-based emissions-reduction projects.[1]

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Given the demand for carbon credits that could ensue from global efforts to reduce greenhouse-gas emissions, it is apparent that the world will need a voluntary carbon market that is large, transparent, verifiable, and environmentally robust. today's market, though, is fragmented and complex.

Some credits have turned out to represent emissions reductions that were questionable at best. Limited pricing data make it challenging for buyers to know whether they are paying a fair price, and for suppliers to manage the risk they take on by financing and working on carbon-reduction projects without knowing how much buyers will ultimately pay for carbon credits.

Based on stated demand for carbon credits, demand projections from experts surveyed by the The Taskforce on Scaling Voluntary Carbon Markets, (TSVCM), launched by Mark Carney, UN Special Envoy for Climate Action and Finance Advisor to UK Prime Minister Boris Johnson for COP26, is chaired by Bill Winters, Group Chief Executive, Standard Chartered and sponsored by the Institute of International Finance (IIF) under the leadership of IIF President and CEO, Tim Adams. Annette Nazareth, a partner at Davis Polk and former Commissioner of the U.S. Securities and Exchange Commission, will serve as Operating Lead for the Taskforce, and McKinsey & Company will provide knowledge and advisory support. and the volume of negative emissions needed to reduce emissions in line with the 1.5-degree warming goal,

McKinsey estimates that annual global demand for carbon credits could reach up to 1.5 to 2.0 gigatons of carbon dioxide ($GtCO_2$) by 2030 and up to 7 to 13 $GtCO_2$ by 2050 (Exhibit 2). Depending on different price scenarios and their underlying drivers, the market size in 2030 could be between $5 billion and $30 billion at the low end and more than $50 billion at the high end.

Yours aye

James Harkins FCILT MTPS
Managing director
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