Dissertation

Title	The Preston Tramway network: An assessment on public opinion and the implications of the proposed Preston tramway.
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URL	https://clok.uclan.ac.uk/9006/
Date	2013
Citation	Hodkinson, Antony (2013) The Preston Tramway network: An assessment on public opinion and the implications of the proposed Preston tramway. [Dissertation]

The Preston Tramway network: An assessment on public opinion and the implications of the proposed Preston tramway.

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Academic year: 2012 - 2013

Submitted in the support of the degree of

Bachelor of Arts with honours in Geography

The following main body of this dissertation is my own work.

Signed…….

A. Hodkinson

Abstract

The need to have a more sustainable mode of transport in a modern city is important as it will help to cut down on the amount of cars and buses being used thus improving the quality of the air and easing traffic congestion.

Surveys were conducted online and in the street at random. The survey was designed to establish whether the general population had any knowledge of a tram system for the Preston area, and what was their opinion of a tram system and whether the majority would be in support of a more sustainable and more eco-friendly form of transportation.

The research revealed that only 21% of the people surveyed have thought about their carbon footprint and only 34% have taken into consideration their carbon footprint and have tried to reduce carbon emissions by cutting down on any carbon emissions by traveling by other means than car/bus. The majority of people would consider using the LRT network if it was constructed. The research also uncovered that a staggeringly large amount of people had no knowledge of a proposed tram system in Preston.

The only limitation to the research was gathering a sufficient amount of surveys due to the public shying away from answering the survey.

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1.0 Introduction

Travel and Transportation is a challenging issue for people worldwide. At an all-time high, world population stands at over 7 Billion people and consequently there is increased demand for more cars to be produced to meet requirements for citizens who need to commute to work, or take their children to school. There is also increased demand for contemporary and sustainable forms of public transport for people who are conscious of their carbon footprint, or who cannot afford to run their own car. However, it is not as simple to just allow car companies to continue mass manufacturing in high numbers, where in many cases, the makes and models emit far too many polluting emissions, therefore further polluting the atmosphere.

The escalating crisis of Global Warming and the forecast for future fuel shortages will result in purchasing a vehicle becoming much more difficult than it is at present particularly due to the raised prices and taxes, such as road tax and the tax added to ever rising fuel prices enforced by the government. This will no doubt make it harder for single people and also families to run their own vehicles from home, especially in the current global financial recession, which does not appear to be recovering. So with the rising costs of buying a car, many people will need to turn to public transport for a simple, cost effective alternative.

It is becoming clearer to the general public and indeed governing bodies, as a result of raised awareness, that all people need to think more conscientiously about their mobility needs. The primary question posed to people is the necessity of owning their own car and whether the optimal comfort and convenience it offers for travelling are prioritised over the benefits of lowering their carbon footprint through the use of public transport. Although the latter might only be suited to adults who do not have families, in many big cities the use of public transport can certainly be more justifiable than private car ownership for the majority of the public, as they can comfortably live in urban spaces due to most essential needs being accessible within short, easily reachable distances, and the space to park and store a car is often unavailable especially in urban areas.

The majority of cities and towns in the UK have regular bus and train services, however it can be argued that buses are less efficient than cars in terms of petrol and diesel consumption and carbon emissions for the same journey by car. This is induced by low

passenger numbers during off peak services where a service may run with just 1 or 2 passengers inevitably releasing higher carbon emissions and fuel consumption per person than would be incurred by the same car journey. The public transport currently provided is becoming 'dated' and is heavily criticised by the public opening the market for something different. The demands of a new public transport system would need to incorporate a more sustainable approach for future generations; more satisfactory to the public as it is a 'greener' option and therefore encouraging peace of mind in the knowledge that they are participating within a community striving to achieve a better world for the foreseeable future.

In general, buses will use a lot more fuel and emit more fumes from the exhaust by the time it reaches the destination than an average car because it is a much bigger vehicle (Walker 2011). Other implications with buses could be the routes which they travel. For example, people having to walk half a mile to board a bus which will then transport the same person another half a mile away from their workplace, or even worse, leave the individual to catch a second bus because the first route ends, leaving the commuter to pay another ticket and take even longer to commute. For instance, Leyland is a small town roughly 6.5 miles (10.46 kilometres) away from Preston, the bus will stop numerous times on the way to the city. Once in Preston the bus will more than likely make a final stop at the bus station leaving any person working outside the central business district to catch another mode of transport or walk the rest of the way.

At this current moment in time, it appears that the most feasible modern mode of transportation is set to be 'Light Rail' also known as 'light rail transit' (LRT) - especially in Preston - where plans have been drawn up and are awaiting planning permission from the local city council. Light rail is more commonly known to the general public as trams, or street cars, depending where in the world you are. Light rail is set to be a top competitor in the modern age of transportation due to many reasons; a major positive point with some light rail systems in place today is that they can be powered mainly by renewable energy sources, such as wind power and solar power, and this could be a huge environmental pull factor for investors and transportation policy.

This project is about the proposed tram network to be built in the city centre and outskirts of Preston, Lancashire. By the end of this project there will be sufficient academic research to support a conclusion on whether the proposed network will add infrastructure to the public transportation in the city of Preston or if it will be a waste of time, money and resources. This conclusion will be based upon relevant literature of light rail and existing tram services already in the United Kingdom (UK) and worldwide, and also upon research with the public perception from people in Preston.

2.0 Literature Review

2.1 Introduction

This chapter provides an evaluation of relevant literature regarding public transportation and more importantly light rail transit. It will provide a short history to explain how public transport has evolved over the past two centuries since mobility began growing as public transportation. Moving more recently to how it has advanced since the turn of the 21st century - on a global and national scale. This section will outline both positive and negative impacts of different transportation systems which run in different places around the world, and discuss varying factors that determine what makes different transportation systems succeed in urban areas and suburban areas with widespread population. More in depth views on British public transportation and existing light rail networks will be discussed to compare with the network which is proposed to be implemented in Preston. There will be literature on the projected future of public transportation and light rail, and which is most suitable for future generations to rely on for many years to come. Finally, the previous work will be summarised and all the discussed literature will give conclusive evidence to offer views on whether light rail transit has a future as an integral form of public transportation in Britain, and indeed Preston.

2.2 History of public transportation and the changes to society and space

There are three forms of transportation which have continuously been used since the late 19th century including tramways, railways, and underground 'metro' systems (tfl.gov, 1985). These three long running public transport systems are used world-wide, to this day, in many cities and built up areas. Other notable mobility systems which were introduced later in the 20th century were - buses, monorail, taxis, air travel, and even ferries – for crossing rivers as seen in New York City.

Public transportation or 'Mass transportation' is defined by Britannica, (n.d) as a service where high volumes of people become mobilised through services provided by private, or public owned companies. These services have evolved from being animal powered - such as horse drawn coaches, to steam powered – such as trains, and the latest motor powered by

the internal combustion engine – such as buses. However the internal combustion is arguably reaching the end of its lifespan to the mass populations due to the call for renewable energy in societies all over the world because of high oil prices and escalating global warming worries.

The rise in technology of public transport during the 19th century helped bring together a new and modern culture of suburbanisation. This new trend was growing because of the rise in public transport; this allowed easier commuting from inner urban areas to settlements which would have previously been inaccessible with only horse coaches (Britannica, n.d).

The invention of trams, and indeed other forms of public transportation were arguably the driving factors in the exponential growth of suburbanisation (Divall & Bond 2003). Suburbanisation was possibly the biggest change in the way in which society used the surrounding space in centuries, especially outside the cities. The tram can be linked heavily with suburbanisation and played a crucial role in creating the suburban ideal. However it was not the only form of public transport involved in this change. There were railways and underground transportation systems below cities such as London, which also played a big part (Brown 2008). It was mainly the tramway which strengthened the introduction of suburbanisation, due to its speed, desirability, and manageability the tram surpassed rail and underground transportation for commuting from the city to the suburb, and provided a more controlled range of accessibility to and from the bordering urban area (Divall & Bond 2003). However, Brown (2008) states "The city accordingly became more specialised or zoned, a process accelerated by railway development from the 1830s, with a central business district, workshop and residential areas." Here brown discusses how rail contributed to suburbanisation more so than tramways and that mild suburbanisation has been around since the late 18th century in the big cities such as "London conspicuously, but also Manchester, Glasgow, Liverpool, Birmingham and Bristol were already past the 50,000 mark in 1800", but these suburbanised areas would have been towns on the outskirts of the city where there was manufacture such as cotton production for example Salford, Manchester. "In 1901, cotton manufacture was still a significant industry in both Salford and neighbouring Manchester - as it had been since the 16th century" According to Nationalarchives (n.d.). These suburban towns were more like mini-cities, in a respect that

the housing was also used as business, rather than places where people can live as a retreat from their workplace like we know suburbs to be in 21st century western civilisation.

Although the rise in availability of public transportation led to the growth of population living in suburban areas, other factors also affected the growth of population sprawl, such as rising income and advancing technology (Kopecky & Suen 2009). The increasing trait of suburbanisation meant changes in property locations to outer urban, easily accessible areas; and this created a knock on effect of transport policies in the UK, such as improved roads and rail links. The transport policies prior to the First World War were not influenced solely on what forms of transportation were the best environmentally and socially for the urban area - and the public using it - but more to incorporate the interest of higher classes such as landlords who saw suburbanisation as a threat to the number of tenants occupying their properties and the price they could charge for rent in the cities. Examples of property owners having the say of transport policy are mainly Paris and Vienna (Capuzzo, 1998), and indeed much of mainland Europe. A distinguished exception was London which led globally in suburbanisation before the First World War (Divall & Bond 2003).

Some parts of the world are only recently catching up to suburban populations of the 'Western' culture, even fairly developed cities such as Beijing, China. Feng, *et al*. (2008) states, "Despite the growing role of market forces, given the role of government, the development of public transportation, and the size and density of population, it is unlikely that Beijing's suburbanization will reach the extreme extent of North American cities." Feng, et al. offers two reasons for the lack of suburbanisation in Beijing, including the low public wages in china and therefore inability to afford automobiles, and secondly, the government using the land to sell for profit (Knox, 1993).

The argument of whether public transportation helps create a suburban landscape is split between two timescales. Both sides partly revolve around mobility and what transport is available to the citizens of the individual place. In the late 19th century suburbanisation there was a high increase in public transport in most of Europe - namely tramways - and this caused a huge increase in the notion, and popularity, of a suburban ideal (Divall & Bond, 2003). On the contrary, a century later, the differing opinions from (Feng, et al. 2008) show that factors leading to suburbanisation in the late 20th century are of government control

and lack of personal wealth to afford to travel in and out of the city, whether that is from owning personal automobiles or commuting on public transport. However modern conclusions from Baum-Snow (2006) shows a “decline of 28% in average central city population can be explained by highway construction”, meaning that the more transportation infrastructure implemented by the governments and local agencies of a place can lead to a wider sprawl of population because of easier commuting in and out of cities.

2.2.1 Brief history of public transportation in Britain

Public transportation in Greater Manchester dates back to records in 1824 where a horse coach was used to carry up to 9 passengers to Manchester Market Street. This was not for the average citizen though; only well off people could afford to use it such as traders (GMTS, 2004). In 1852 the passenger size rapidly increased to 42 due to a double deck coach innovation, this brilliant upgrade lead to prices being halved on the same journey which was previously made by a small coach.

Further north in the town of Preston, the horse powered public transport business took longer to start. In order for horse powered stagecoaches to efficiently run, the roads needed to be vastly improved (Stagecoach, 2013) and it was because of the quality of roads that the first recordings of organised public transport were in 1859 (PrestonBus, n.d). Preston was a town which was flourishing deep in the time of industrial revolution and around the introduction of public transport came even more trading. Lambert, (n.d) states that “During the 19th century, industry in Preston was dominated by cotton” this was being vastly exported and needed transportation in order to efficiently trade. It was because of the cotton industry in Preston that the Albert Edward dock was constructed in 1892 (Lambert, n.d). Therefore the availability of transportation increased as a result of cotton trading, and cotton trading also benefitted from a better transportation infrastructure.

The next leap in public transportation was in 1877 when the first tram ran in Manchester which was powered by horses. Over 20 years later in 1902, electric trams were in operation and horse powered transportation ceased to run, in a way this was the end of great service provided by horse drawn transport but it lead society into a new era of local mobility

(GMTS, 2004). Tram lines ran throughout the entire Manchester area by 1914, but even though the vast infrastructure of transportation in Manchester was dominated by trams, the First World War meant the maintenance of the tramway was neglected and had to be renovated. The rise in popularity of buses lead to a call to replace trams with the bus services just before the Second World War started in 1938, however due to the shortages of oil, the tramway carried on running from electricity instead of buses using valuable oil which was to be used for military and production (GMTS, 2004).

2.3 Modern public transportation

In the 21st century public transportation still plays a huge role in many people's day to day lives, whether it is for commuting to work or for leisure purposes, therefore public transport is constantly a major issue for governments worldwide. In a time of worldwide financial crisis, and an ever increasing global population (Blogs, 2012), the sprawl of population is expanding to cheaper suburban areas, this trend has most notably recently been seen in the biggest city in Europe, Moscow. In Moscow people have been moving into 'economy class' apartments for cheaper rent, however problems with this new trend include the construction of such apartments, and the increasing demand for public transport in a city which is already notorious for congestion (Mason & Nigmatullina, 2011). The sprawl of population in modern day Moscow is following a trend associated with the suburbanisation of the United States (US), as Mason & Nigmatullina, (2011) state "But in the post-Soviet era weak planning controls have allowed Russia's major metropolises to start sprawling, American style".

However the transportation systems which Russia will choose to implement could be a huge deciding factor of whether the suburbanisation can succeed socially. Russia is already following a US style sprawl but it is debated that the European public transportation systems are better models to follow according to eea, (2006) "European countries tend to have more centralized planning systems, more compact cities, and much more efficient intercity and intracity public transportation systems than does the United States." It is clear that public transport policies and systems need to be addressed and constantly updated to make places, especially cities, thrive as much as possible. However if Moscow continues to

follow US suburbanisation trends, it could lead to a deficit in transport policy comparing to European methods, and could leave the city with even more mobility problems.

There has recently been a tram revival in Moscow, and according to Moscow.ru, (2013) "A tram is more eco-friendly than a trolleybus and it is the safest transportation vehicle … reconstruction of 80 km of tram roads has been planned up to 2010." This shows there is faith in modernising and expanding cities in the creation of long term tram / light rail systems across the world.

Worldwide, the main forms of short journey public transportation in the 21st century are – bus, tram, underground (metro), regional taxi, light rail, and train (Government.nl, n.d.). The system which is proposed to be constructed in Preston city centre is a light rail network. Preston already has abundant bus routes, taxi companies and a large train station, but the main attraction of a light rail network is the environmental aspect especially the designed routes in Preston, where it is proposed to run on renewable energy, such as wind and solar, long term goals are to reduce carbon emissions by 75% (Prestontrampower, 2012). The renewable possibility for electrical light rail transit systems is possible and is seen in Toronto as well (Torontoenvironment, 2010).

As far as modern mobility goes for Britain the light rail systems look to be the most productive and futuristic, despite the concept of trams being the oldest form of powered transportation to run in Britain. Other systems which could be classed as a more futuristic form of transport could be monorail type infrastructure as seen in cities such as Tokyo and Seattle. The profitability and safety of monorail systems are major attractions, however the thought of having such a system in England is unheard of, and no such plans exist excusing the existing small networks in tourist attraction parks – such as Alton Towers (Monorails.org (n.d.). However there is a plan for a privately funded monorail to be built in Cardiff, Wales (Iota, n.d.). A lack of interest could be due to aesthetical values of the elevated structure of the beams which carry the vehicle, it would be possibly be classed as an eyesore in many parts of Britain due to the looming shadow cast from the overhead beams, instead underground mobility and ground level rail networks are more in favour.

The futuristic monorail and tramways are both very similar systems other than the one blatant difference - the elevation of the track. The monorail track means it is safer for pedestrians; however accidents still happen with passengers on the monorail vehicle through human error of the drivers, or mechanical errors such as the brakes failing. The Disney World tourist attraction in USA experienced some problems with their monorail network when a driver was killed from a crash with another monorail vehicle after the brakes failed (Leonard, 2009).

2.4 The use of light rail transit (LRT) in Britain

A tramway is defined to be a vehicle running on parallel rails in a street of which can also be occupied by either pedestrians or other road traffic, or both. The driver of the LRT must have clear view of the path ahead to ensure public safety; the foresight distance for the driver should be the distance of which the driver can stop the vehicle (RailRegulations, 2006). There are many of these tramways in Britain however only a handful of LRT systems are in place today, all in England. The current LRT systems in Britain are in Birmingham, Blackpool, Croydon, Manchester, Nottingham and Sheffield. (News.bbc, 2011).

"the last 20 years have seen renewed interest as it becomes clear that many LRT systems in European and North American cities are helping to reduce automobile emissions and revitalize city centres." – Hattori, S (2004).

The use of trams is becoming popular again in the British Isles, since the abolition of all tramways, other than Blackpool, in the 1950s (RailRegulations, 2006), the modern attraction to tramways is the ease of accessibility, the speed and comfort of the ride, and most importantly the environmental impacts. The acceleration in the use of tramways and LRT systems in the UK is not slowing down, if anything it is increasing as popularity continues to grow across the nation (Light rail trips near 200 million, 2011). As shown in Table 1, there are millions of journeys made per year on these environmentally friendly transportation networks, especially the Docklands Light Railway.

Table 1 - Light rail passenger-journeys, million

Legend for Chart:

A - Docklands Light Railway

B - Croydon Tramlink

C - Nottingham NET

D - Midland Metro

E - Sheffield Supertram

F - T&W Metro

G - Manchester Metrolink

H - Blackpool Tramway

I - Total

	A	B	C	D	E	F	G	H	I
2005-06	53-5	22-5	9-8	5-1	13-1	35-8	19-9	3-6	163-4
2006-07	63-9	24-6	10-1	4-9	14-0	37-9	19-8	3-4	178-6
2007-08	66-6	27-2	10-2	4-8	14-8	39-8	20-0	2-9	186-2
2008-09	67-8	27-2	9-8	4-7	150	40-6	21-1	2-3	188-6
2009-10	69-4	25-8	9-0	4-7	14-7	40-8	19-6	2-2	186-2
2010-11	78-3	27-9	9-7	4-8	150	39-9	19-2*	1-6	196-5

"Not directly comparable with previous years due to revised method for calculating passenger boardings.

Source : Light rail trips near 200 million, (2011)

Despite the sudden surge in growth of light rail transit, Souter (2001) claims that the tram had disappeared by the 1960s only to reappear just over 10 years later

"During the first quarter of the twentieth century the electric tramcar was the dominant mode of local transport in the urban areas of this country. Thereafter, this position was ceded such that by the 1960s tramways had practically disappeared, a rate well in advance of experience elsewhere. Interest in light rail reappeared in the 1970s and six new systems are now in service."

The life cycle of tram networks has seen a yo-yo type effect since the invention over a hundred years ago. Maybe this is the reason why private financiers of such networks are reluctant to invest hundreds of millions of pounds into a divergent and unstable future, and also councils reluctant to subsidise and allow construction of the systems. However companies are making profit from such networks, "Tram Power is involved in a number of new tramway projects in Europe. The most advanced is in Galway (pop. 85,000)" TramPower (2012).

Some modern LRTs have not lived up to expectations such as Edinburgh, Scotland. This system had major delays in the construction process and because of the delays local businesses suffered. Despite problems with the LRT in Edinburgh, it is still going ahead and the latest news is that a 2.8km stretch of track has been completed and passed certain tests and is set to be a running, complete service by 2014 (Edinburgh.gov, 2013)

2.5 Is light rail transit (LRT) better than other forms of transport?

Privately owned automobiles are constantly becoming more expensive to own and run, and because of the rising costs, increasing congestion and lack of parking in many areas of Britain. Not to mention the negative effect which automobiles have on the environment, consuming vast quantities of fossil fuels [oil mainly], carbon emissions, noise pollution and community health problems (Henderson, 2007). LRT seems to be the most worthwhile replacement for most public transport as we reach an age where renewable energy emphasises strongly towards changing the environmental impacts of social mobility for the better, and hope to reverse effects brought on by internal combustion engines. According to

PrestonTrampower, b. (2012) the LRT can be "Powered by renewable sources of energy, such as wind and solar power, the trams are environmentally friendly, and even with a full capacity of 200 passengers, the tram will use less energy and be as quiet as a family car."

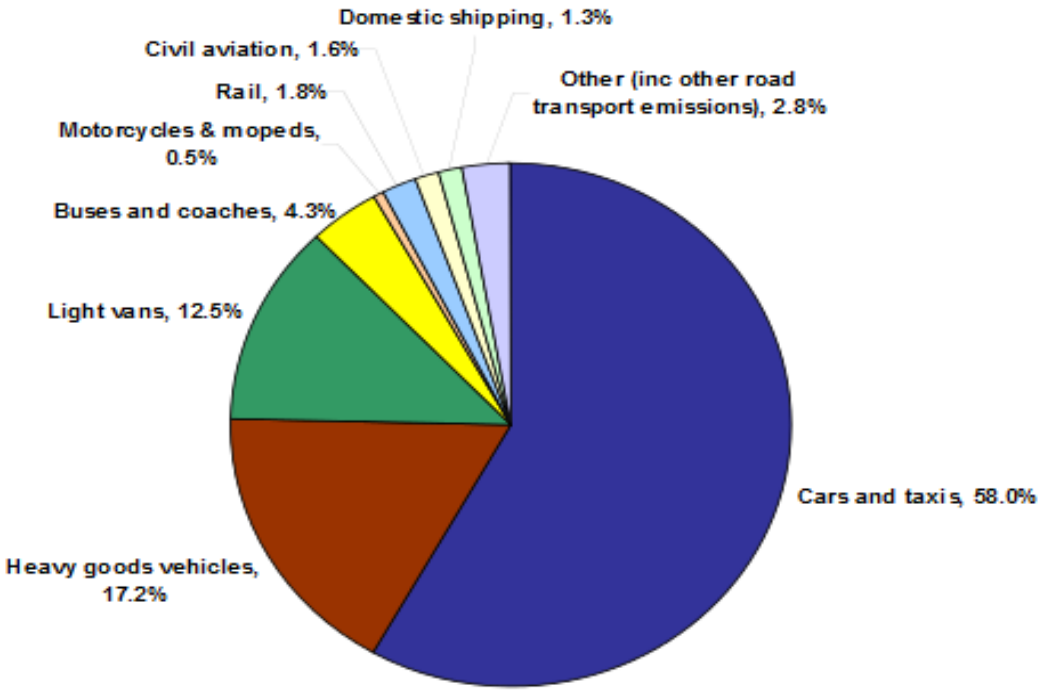


Figure 1 - UK domestic transport greenhouse gas emissions, 2009

Source : National Statistics (2011).

Figure 1 shows the output of greenhouse gas emissions in UK, year of 2009. It is more than clear that internal combustion engines contribute almost all of the greenhouse gases and this should be reduced and if possible stopped as soon as possible, not only are there implications to the environment through global warming but human health is possibly effected directly because of the pollution emitted from cars, vans and heavy goods vehicles. With light rail it is possible that the running of services around Preston can produce absolutely no carbon due to clean electrification, therefore using no fossil fuels for day-to-day running (PrestonTrampower, b. 2012)

There are other functions of LRT systems where energy can be harnessed so the target of renewable sources of power can be slightly shortened, such as braking energy utilisation as seen with Tri-Met, in US. Light rail can use a system of energy storage rather than nonstop electrification, with utilized energy storage there is better efficiency in the method of how to create kinetic energy for the tram to move around the city and as stated by Griffin (2001) "Ultra-light rail systems are small-scale tramways that utilize energy storage rather than continuous electrification. They have excited considerable interest because potentially they are a very cost-effective way of providing attractive urban public transport." This energy utilization is a mix of different technologies being developed by engineers across the world. The different technologies include the process of deriving energy from the deceleration of a vehicle - or braking - and transforming that into kinetic utilized energy for the acceleration of the tramcar when it sets off from a stop along the route. This energy harness is now possible because of a double layer capacity innovated by TriMet (2012) and "The air-cooled capacitor units will release previously stored electrical energy upon acceleration, thus using nearly 100% of the regenerated power captured from braking trains."

The tram is regarded highly to Ishino, *et al*. (2012) because it is "more environmental than a bus and has attracted attention in an aging society**.** LRT called next generation type streetcar has low-floor vehicles which is easy to get on and off, and is introduced in many cities." It is possible for storage of energy, therefore will not need as much electrification, it can also feed energy off other streetcars in local proximity (Tri-Met, 2012) (Ishino, *et al*. 2012). Ishino*, et al*. (2012) goes on to say that "Moreover, when the case where charge became impossible among 4 stations in some sections was assumed, 1.07% of consumption energy reduction was possible by charging to the capacitor voltage appropriate for the condition instead of full charge."

LRT has one main rival in terms of other local public transport systems if it is to be made in Preston. This is buses, which currently run all throughout Preston. But no matter how long the buses have been running in the city of Preston there is one thing which they can be faulted on and this is their environmental impact, along with social impacts such as the time keeping of the bus service, never mind the fact that there are plans to knock the bus station down (Moville, 2012).

Despite the above sentence buses still live up to their uses, for reasons taken from Britannica, a. (n.d).

“The bus requires less street space, equivalent to 2 or 3 automobiles, and, when it is full, it requires much less energy to move each person. Because emissions from internal-combustion engines are proportional to fuel consumption, a full bus will produce less pollution per person-trip than an automobile. Finally, because they are operated by professional drivers, buses have a lower accident rate than automobiles. Electric rail rapid transit trains produce even less air pollution and are far safer per person-trip than either automobiles or buses.”

However good the bus sounds, the trams and LRT always seem to come out on top in a paper comparison between the two especially in the case of environment factors such as the fuel use -

“Based on other tram systems, eg in Manchester and Croydon, Department for Transport figures show that trams emit 65.0 grams of CO2 per "passenger kilometre" whereas for buses it's 89.1. The average petrol driven car emits 182.2 grams of CO2 per kilometre.” – News.bbc (2008).

Despite all of the positive elements in theory of creating LRT networks across Britain, there are certainly some negative impacts which need to be addressed. For example the cost to build the lines and rails, along with the fact that traffic will be interrupted and pedestrians might be redirected. The public safety is a debatable issue where trams are concerned due to the fact that they are a quiet form of transportation and often share a highway with other road users especially pedestrians such as Blackpool and Manchester (Gov.uk, 2013).

The latest network to have had bad publicity in the UK is Edinburgh. This tramway construction exceeded the budget, over the time allocated and the city eventually lost faith (Alstead, 2013). Now the UKs most infamous urban transportation development is almost completed but the problems involved along the way caused much grief for local people and business owners. The cost of the tramway so far has inflated 50% to original plans (Alstead, 2013). If ever there was an advertisement for an anti-LRT movement, the Edinburgh tramway construction would be the focal point.

Another major problem with LRT is the danger it poses to other highway users, especially pedestrians. There are many cases where people are injured, or in more severe cases, die due to collisions with trams, months ago a teenager was killed at a level crossing in Nottingham, England. Only 4 years before at the same crossing two other people were killed (BBC News, 2012). Of course danger comes with LRT networks especially because of their low noise and visibility, danger is always a case when mobility is involved, walking, cycling driving are all relatively dangerous activities and trams are maybe given bad press when really it should be governing bodies in charge of certain policies.

2.6 Trams moving forward and future systems

Knowles, R. (2006) -

"Light Rail schemes were key components of plans to improve accessibility and personal mobility in conurbations as part of the UK Government's Integrated Transport Policy and its 2000 Ten Year Transport Plan. However by 2004 light rail's future in Britain looked bleak as sharp increases in capital costs, following the demise of Rail track and the loss of private sector confidence, led Government to withdraw its part funding of light rail schemes in Leeds, Liverpool, Manchester and Portsmouth."

"Strasbourg in France decided to run uniquely designed LRVs that would become a symbol for the city and the strategy has successfully improved the city's image. Today's transit systems are expected to blend in with the surrounding cityscape and add to its aesthetic appeal. Cities planning LRT systems sometimes face opposition from residents who fear that the catenary will be an eyesore. – Hattori (2004).

Unknown (2013)

"The plan has a total budget of GBP37.5bn over the period - including GBP4bn to be spent annually on upgrading railway infrastructure - and reinforces our outlook for strong growth in railways infrastructure industry value"

However The government in power now has drawn up plans to return powers back to national scale in relation to transportation infrastructure and will enforce implications of

how transport policy is kept in England. The previous government [labour] helped start a regional power of transport policy such as the Regional Funding Allocations [RFAs], however the coalition government who run Britain now are about to change it yet again and take power away from local and regional councils across the Kingdom. (Stafford & Ayres, 2013)

2.7 Summary

An electric light rail transit system has the enormously exciting potential to use renewable energy sources to power the network. The idea that renewable energy can be used means there would be a steep decline in reliance on burning oil or coal to travel every day. This is a great way to please environmentalists and society alike, by using efficient and clean modes of transport; it also aids the attempt to beat climate change at the same time, saving the government and its nation money through lower carbon outputs - which are becoming increasingly costly. A previous system where the entire light rail system uses renewable energy is the city of Calgary, in Canada. The network in Calgary uses wind power, saving thousands of tonnes of carbon emissions each year (Ludlam, S., n.d.) “Not only is light rail quieter and less intrusive than buses and heavy rail, it uses less energy per passenger kilometre than both these modes of transport.” Perthlightrail.org, (n.d.).

Are we moving back to the age of living in the city? If so then what public transport will be needed other than small systems such as tramways and buses. Rail to transport goods, but will there be an eradication of privately owned vehicles? Implications of this could be huge, people would not know what to do.

3.0 Methodology

This study intends to examine the public awareness and the conception that the public has of sustainable transport and the need in the current society which we live in. Everybody must know about global warming through mass media and most people know that a major contributor to greenhouse gases present in the atmosphere is automobiles and other transportation systems, especially those which utilise the internal combustion engine to power such modes of mobility. The aims of this study are to send out surveys through internet sources and also through personal collection on streets of Preston, and gain knowledge of what the public knows and wants to see happen in terms of sustainable transportation in the UK.

The surveys questions were all close ended questions which often required simple responses for the general public to understand which provided a broader scope of views and give the average range of people to respond to give fair feedback of what people in Preston city want. The option to expand for some responses was given for certain questions which might have required answers other than provided.

The data collection was done through asking pre-determined questions, which can be found in the appendices. People were asked randomly on the street in Preston and also through an online survey company (smart-survey.co.uk). The total responses required was 100, this was in order to get a good average of different groups of people. These 100 people interviewed were assured that their responses would be kept anonymous to ensure they provided the most honest answers that they could. At the time of conducting the survey on street level, the responses were noted down on paper and then later typed up that night onto computer screen, ready to be input to graphical format as seen in the results section.

The results section will visually aid the reader to show what responses came from the public before reading more interpreted discussion about all individual graphs.

3.1 Study area

The study area was Preston, Lancashire. The closest area to Preston which has a running tram network is Blackpool, also shown on the map. Blackpool has the longest running tramway in England, in fact the Blackpool tram carried on running in the UK when all others were decommissioned. The area comparison between the two cities is relatively similar however there are many underlying differences between the two areas.

Figure A – Map of Preston & Blackpool, Lancashire.

Available from : maps.google (2013).

The main study site in Preston was the city centre outside 'The Mall' near the crossroad of Friargate and Ringway. This location was chosen because a high volume of people walk by here who can be stopped for the survey.

Figure B – Image of Preston city centre, looking from Friargate.

Available from : maps.google (2013)

This location is relatively in the middle of the university campus, shops, businesses, and the major transportation drop off points of Ringway and Friargate. The bus station is also rather close by.

This location means high numbers of people who may have already used public transportation in order to travel into the city centre that day, therefore this spot gives a fair test on whether the public would actually use the tramway if it was built compared to travelling in on buses, which would be the main rival for the LRT.

4.0 Results and Discussion

The following results and graphs are created from the answers given by the public who participated in the surveys, these results can be found in table format in the appendices section.

Figure 2.

Figure 2 shows the distance that people live from Preston city centre. This result is rather important in determining what range of people travel to the city centre. The interesting results here are the 0-2 miles and 2-5miles options because these are the people who will be using short range public transport (if not walking or cycling). The tram circling around Preston is ideal for the people living around the 2 mile mark away from Preston CBD. The people who live further than 5 miles are also especially useful here, these could be ideal users for the park and ride scheme offered by the proposed Preston LRT system, but on the other hand, the far distance could mean more train journeys into the city centre.

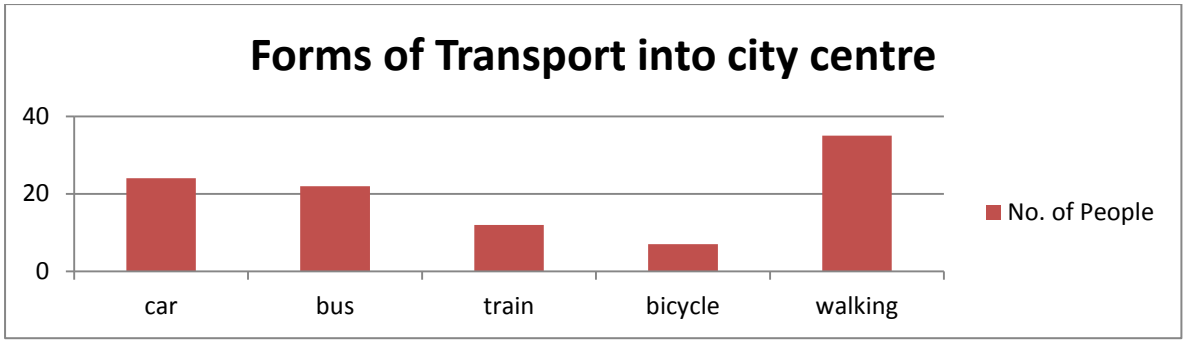


Figure 3.

Figure 3 shows how each person who took part in the survey usually travels into the city centre. The most common answer is walking. This was to be expected by taking into account the high percentage of people who live in such a close proximity. Bicycle was surprisingly higher than anticipated, due to there not being many secure locations to leave a bike in Preston, although cycling is very popular in the current society especially after the success of British cycling in the Olympics last year.

Most surprising of all was the high number of bus users who almost matched the amount of car users. Relatively cheap bus fares for Preston city centre could be the reason for this. Automobiles are highly expensive to run and continuously growing costs could lead to lower personal mobility, but more public transport users in the short future could lead to local governing bodies investing more money in revitalizing mobility systems in Preston area, maybe by accepting the proposal of the LRT network.

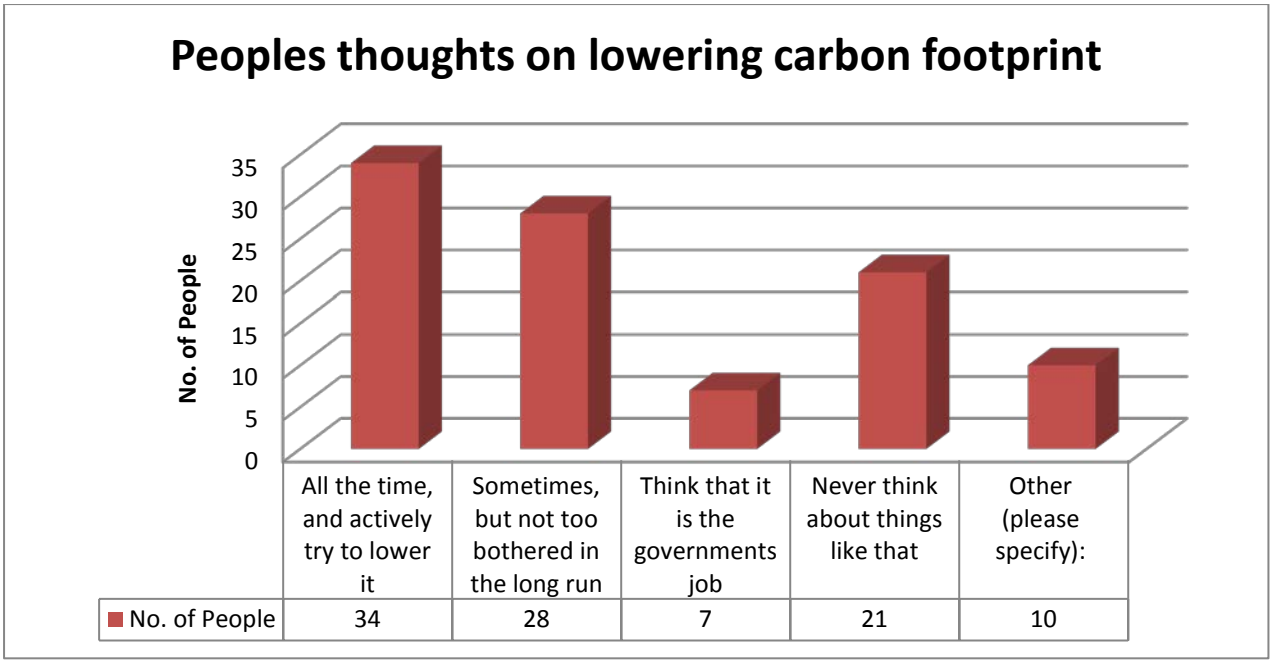


Figure 4.

Figure 4 shows various peoples thoughts about their impact on the environment through their travel habits. This is to engage the mind-set of the general public to see if they are looking or are making it known that they want a form of sustainable transport to be the primary form of mobility in the city of Preston.

The majority of people said that the actively think about their impact and try to minimise it by travelling in or more simply by travelling less. These are the people who I would assume would know about the proposed LRT network comparing with people who think that their carbon footprint does not affect the environment.

7% of people admitted that they thought it was the governments job to lower individual carbon footprints, this as expected because people like to shift their own blame on governing bodies however at the end of the day, it is up to the public to keep society running in a civil way, and due to growing evidence of global warming they should be more aware that their impact is up to themselves and only they should choose to change their mobility use through own will.

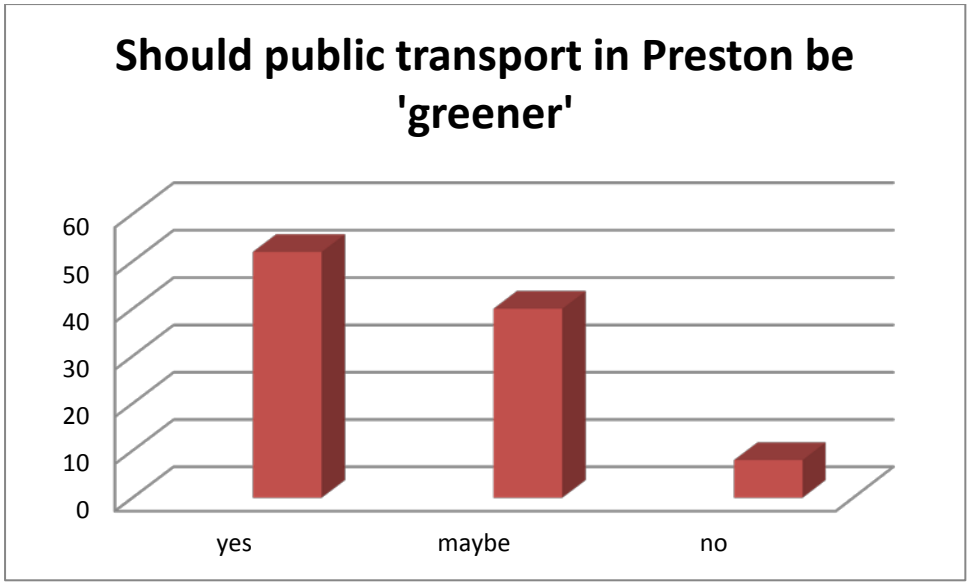


Figure 5.

Figure 5 shows the amount of people who believe that transport should be ‘greener’, or more sustainable. The high majority of people who said yes show that there would be a market and public consensus for sustainable forms of public transportation. Also a high number of ‘maybes’ means that people most like thought about it but are not sure whether it will impact their lives more than they are comfortable with.

The LRT system would certainly have a negative impact on Preston during the construction but the long term impact is what people need to think of. The LRT network would be More a next generation benefit to people’s children and grandchildren of Preston, so if the public had more knowledge of sustainable transportation prior to the survey maybe more of the answers would change from ‘maybe’ to ‘yes’!

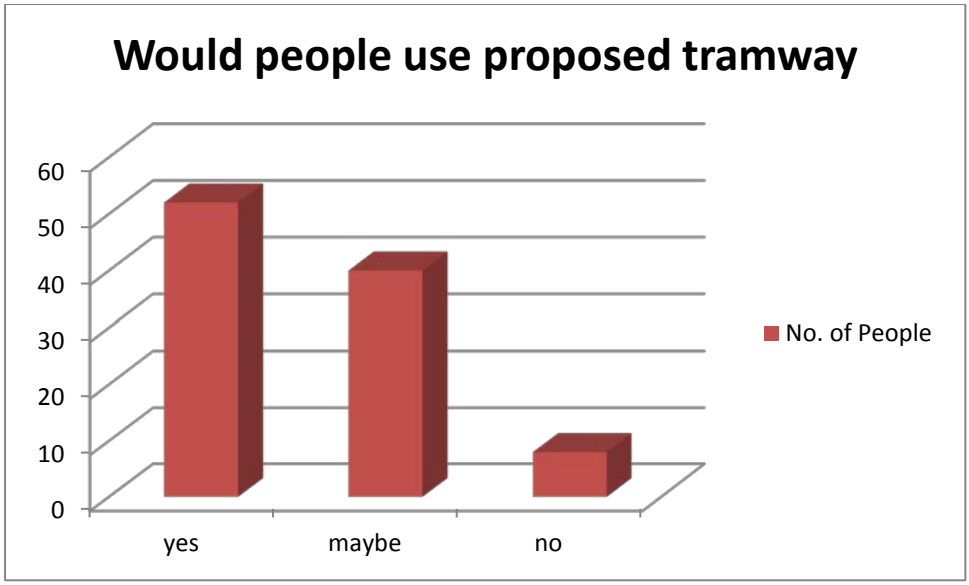


Figure 6.

This is one of the most important questions despite it being one of the simplest. This clearly shows the tram would be highly popular in Preston, if affordable; the main marketing group would be students and people who live anywhere in the city near the rail lines. The park and ride schemes which will be offered will also lower congestion in the city by attracting people who drive to Preston, more likely for work, and offering them a secure place to park while they relax and travel the rest of the way to work or shop.

There are a number of people who have said they would not use the system. This could be because they live very close to all amenities that they need and can walk or cycle to places, or it could mean people drive into the city and are too attached to their cars to change mobility modes.

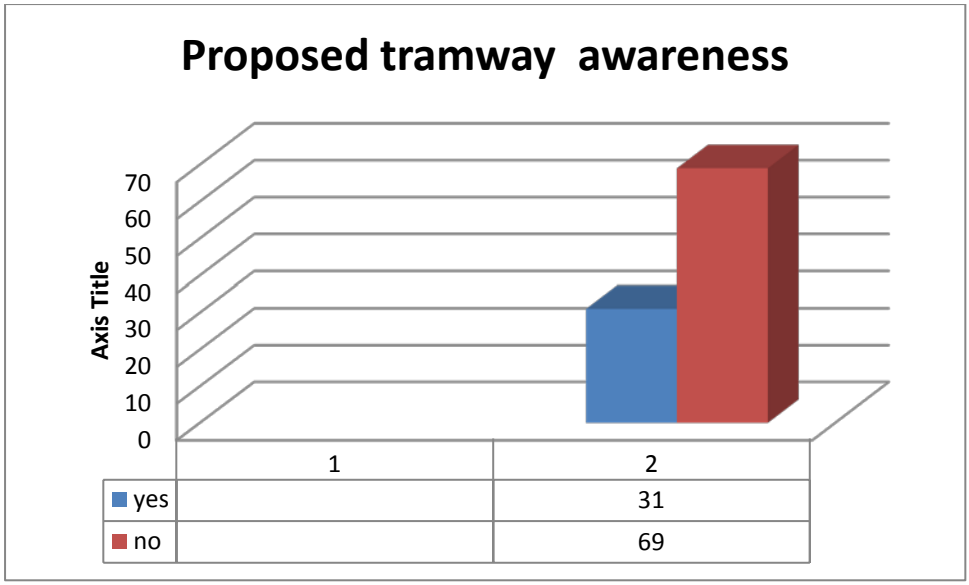


Figure 7.

The proposed tramway network has not been publicised as much as maybe it should have. It has been in the local newspaper (Lancashire Evening Post) however the public awareness in Preston is lacking. There have been no advertisement campaigns of what I know of; only 31% of people recognised such a plan to dramatically transform the city centre of Preston by the addition of a revolutionary mode of public transportation.

With 69% of the public being unaware there is no wonder why the tramway is lacking interest from investors and council members who are the deciders of the planning permission of such a network.

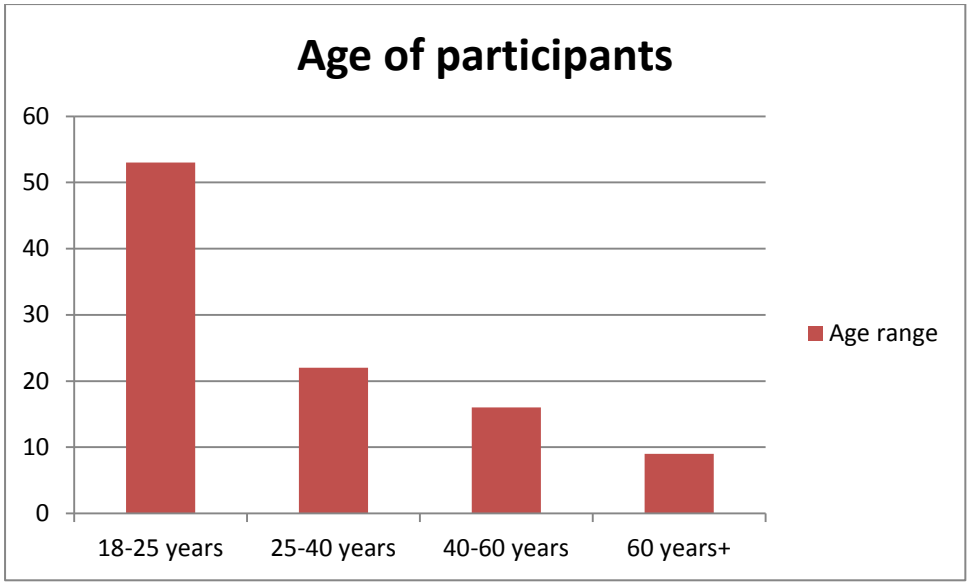


Figure 8.

Figure 8 shows the age of participants, the majority are young people, more than likely students as the survey was taken on a weekday and parts was done near the university campus.

The high number of young students who participated in the survey could have provided differing answers compared to the people interviewed who actually live in Preston and have long term ties. The students from perhaps different regions might not bother about the disruption that the construction in Preston would make because they are only here in Preston for a fraction of the year and do not have as much connection with the city as the locals do who have grown up and intend on living their lives here.

5.0 Conclusion

The LRT network which is proposed to be built in Preston is proven to be a sustainable form of transportation, therefore offering long term reliability and value to the members of the public who would use such a system. Tramways are established forms of transport in Europe and have been for over a century since the invention. Despite the decommission in much of Britain, the growth of tramways is rising and the users of LRT reached over 200 million last year, which was a record high (Light rail trips near 200 million, 2011).

The growth of tramway networks in the UK comes with certain negative impacts to local surroundings, as seen in Edinburgh. During the construction process in Edinburgh, local businesses experienced huge loss of profits, these businesses reported that local councils did not subsidise as well as they should (Carrell, 2011). But although businesses are suffering now, once the new system is built and running, there will be more investment opportunities in the gentrified area.

The main results show that the most common participants were young people; this explains the lack of knowledge and awareness regarding local plans to build new travel infrastructure which was published in local newspapers.

Even though only 31% of the people questioned knew that there was a proposed tramway to be built in Preston, the majority of people said they would use the network if it was competitive with other forms of transportation. 40% of the public also said they would consider using it which is also promising, once they witness for the better ambience of LRT in the city themselves, they would most likely use it as well as, if not replacing, buses.

A very strong correlation between people who believe transport should be more sustainable (eco-friendly) and the people who would use the LRT - if it existed - shows that if the public knows about environmental problems and wants to tackle the problems with sustainable forms of technology then they will do so. This correlation between figures 5&6 also shows that people who are against new transportation systems in Preston do not want ‘green’, sustainable transport, this could be due to different reasons. For example the public could believe that the addition of sustainable transport will cost more money to them for the benefits which Preston will profit from in the longer term.

The electric light rail system has the potential to be an amazing long term investment, not only economically speaking, but socially and environmentally also. Although it might appear to some people that it would be taking a step back in urban transportation to when the trams were first implemented over a century ago, they could not be more wrong! The notion of mass light rail infrastructure in every urban space would indeed make a great contribution to society through all of the benefits reaped. The main benefit of the notion of light rail infrastructure in every urban area would be the environmental impact. The environment and air quality would profit due to the momentary suppression global warming, in terms of public transportation, through the drastic lowering of carbon emissions and greenhouse gas use of public mobility needs. If all cities were to implement these futuristic LRT systems then the carbon footprint in Britain could be lowered on a vast scale, saving money for the government through carbon schemes, and improving air quality.

Limitations

The main limitation for the research was the unwillingness of the general public to complete a survey. While carrying out the survey a lot tended people avoided contact in the street.

If the research were to be carried out again all the data would be collected via the survey site this would avoid the general public feeling hassled in the street.

The survey would be re written to establish whether the general population prefer their own transport or to use public transport and whether the general population would prefer a bus to a tram system. The survey would also establish how many times a tramway system would be used from Preston to its terminal or whether the public would prefer to use a car as deemed quicker and more convenient.

If this research was to be repeated, more in-depth contact, qualitative interviews with regulators, councillors and engineers involved with such networks would be input, to offer a more wide spread view of what companies and councils want to achieve by creating this sustainable transport.

References

Alstead , A. (2013) *Edinburgh's trams: city 'has lost faith' in a botched, damaging scheme*. [online] Available at: http://www.guardian.co.uk/uk/scotland-blog/2013/mar/21/edinburgh-trams-lost-faith [Accessed: 18 Apr 2013].

Carrell, S. (2011) *Edinburgh tram project back on track as deal signed*. [online] Available at: http://www.guardian.co.uk/uk/2011/sep/15/edinburgh-tram-project-back-on-track [Accessed: 19 Apr 2013].

Baum-Snow, N. (2006) *Suburbanization and Transportation in the Monocentric Model*. [e-book] Rhode Island: Brown University. http://www.econ.brown.edu/fac/Nathaniel_Baum-Snow/model-paper.pdf [Accessed: 13 Apr 2013].

BBC News (2012) *Teenager in tram collision dies*. [online] Available at: http://www.bbc.co.uk/news/uk-england-nottinghamshire-20538567 [Accessed: 18 Apr 2013].

Blogs, (2012) *The World Population at 7 Billion | Random Samplings*. [online] Available at: http://blogs.census.gov/2011/10/31/the-world-population-at-7-billion/ [Accessed: 12 Mar 2013].

Britannica (n.d.) *mass transit*. [online] Available at: http://www.britannica.com/EBchecked/topic/368374/mass-transit [Accessed: 17 Apr 2013].

Britannica , a. (n.d.) *mass transit*. [online] Available at: http://www.britannica.com/EBchecked/topic/368374/mass-transit [Accessed: 17 Apr 2013].

Brown, R. (2008) *Looking at History: Urban growth: Suburbanisation*. [online] Available at: http://richardjohnbr.blogspot.co.uk/2008/04/urban-growth-suburbanisation.html [Accessed: 11 Apr 2013].

CAPUZZO, P. (1998) The defeat of planning: the transport system and urban patterns in Vienna. *Planning Perspectives 13(1*), p.23-25

Divall, C. & Bond, W. (2003) *Suburbanizing the masses: public transport and urban development in historical perspective*. Aldershot, Ashgate, p.28-32

Edinburgh.gov (2013) *Trams news - News centre- City of Edinburgh Council*. [online] Available at: http://www.edinburgh.gov.uk/news/20085/trams [Accessed: 18 Apr 2013].

EEA [European Environment Agency]. (2006) *Urban Sprawl in Europe: The Ignored Challenge*. Copenhagen: European Environment Agency.

Feng, J. et al. (2008) New trends of suburbanization in Beijing since 1990 : from government-led to market-oriented. *Regional Studies*, 42 (1), p.19.

GMTS. (2004) *Public Transport History - Greater Manchester's Museum of Transport*. [online] Available at: http://www.gmts.co.uk/explore/history/history.html [Accessed: 4 Apr 2013].

Gov.uk (2013) *Road works, level crossings and tramways (288 to 307) - GOV.UK*. [online] Available at: https://www.gov.uk/road-works-level-crossings-tramways-288-to-307/tramways-300-to-307 [Accessed: 16 Apr 2013].

Government.nl (n.d.) *Types of public transport | Mobility, public transport and road safety | Government.nl*. [online] Available at: http://www.government.nl/issues/mobility-public-transport-and-road-safety/public-transport/types-of-public-transport [Accessed: 17 Apr 2013].

Hattori, S. (2004) Trams Making Way for Light Rail Transit. *JAPAN RAILWAY & TRANSPORT REVIEW*, 38. p.30-31.

Henderson, H. (2007) *21st century city challenges*. [Cover story], *Ecos*, 135, pp. 14-17.

Iota.org.uk (n.d.) *cardiffmonorail*. [online] Available at: http://www.iota.org.uk/News/cardiffmonorail.php [Accessed: 14 Apr 2013].

Ishino, K. et al. (2012) *Energy-saving operating strategy of a catenary free light rail transit*. New Jersey, Piscataway.

Knox, P. (1993) *The Restless Urban Landscape*. New Jersey, Prentice-Hall.

Kopecky, K. and Suen, R. (2009) *A Quantitative Analysis of Suburbanization and the DiÆusion of the Automobile*. [e-book] p.1-5. http://www.karenkopecky.net/SandAPaper.pdf [Accessed: 13 Apr 2013].

Lambert, T. (n.d.) *A History of Preston*. [online] Available at: http://www.localhistories.org/preston.html [Accessed: 4 Apr 2013].

Leonard, T. (2009) *Disney World monorail crash kills driver - Telegraph*. [online] Available at: http://www.telegraph.co.uk/news/worldnews/northamerica/usa/5752356/Disney-World-monorail-crash-kills-driver.html [Accessed: 14 Apr 2013].

Light rail trips near 200 million (2011) *Rail Business Intelligence*, 397, p. 7, Business Source Complete, EBSCO*host*, viewed 17 April 2013.

Ludlam, S. (n.d.) *The Perth Light Rail Network*. [e-book] Perth: The Greens. http://scott-ludlam.greensmps.org.au/sites/default/files/perth_light_rail_-_leaflet_0.pdf [Accessed: 27 Feb 2013].

Mason, R, & Nigmatullina, L 2011, 'Suburbanization and sustainability in metropolitan Moscow', Geographical Review, 101, 3, pp. 316-333.

Monorails.org (n.d.) *Alton Towers*. [online] Available at: http://www.monorails.org/tmspages/Alton.html [Accessed: 14 Apr 2013].

Moscow.ru (2013) *Moscow - Moscow International Portal :: Tramway*. [online] Available at: http://moscow.ru/en/guide/trip_planning/inner_transport/transport/tramway/ [Accessed: 14 Apr 2013].

Moville, M. (2012) *Preston Bus Station and Car Park - questions and answers | Preston City Council*. [online] Available at: http://www.preston.gov.uk/yourservices/preston-bus-station-and-car-park/preston-bus-station-car-park-questions-answers/ [Accessed: 16 Apr 2013].

National Statistics (2011) *Transport Statistics Great Britain 2011*. [e-book] Department for Transport. http://assets.dft.gov.uk/statistics/releases/transport-statistics-great-britain-2011/tsgb-2011-summaries.pdf.

Nationalarchives (n.d.) *The National Archives | Exhibitions | 1901 Census | People and places*. [online] Available at: http://www.nationalarchives.gov.uk/pathways/census/pandp/places/salf.htm [Accessed: 11 Apr 2013].

News.bbc (2008) *BBC NEWS | Scotland | Edinburgh, East and Fife | How green are Edinburgh's trams?*. [online] Available at: http://news.bbc.co.uk/1/hi/scotland/edinburgh_and_east/7320800.stm [Accessed: 17 Apr 2013].

News.bbc (2012) *BBC NEWS | Scotland | Trams in the UK*. [online] Available at: http://news.bbc.co.uk/1/hi/scotland/7318521.stm [Accessed: 15 Apr 2013].

Perthlightrail.org (n.d.) *Why Light Rail? | Perth Light Rail*. [online] Available at: http://perthlightrail.org/content/why-light-rail [Accessed: 27 Feb 2013].

Prestonbus (n.d.) *The History of Public Transport in Preston*. [online] Available at: http://www.prestonbus.co.uk/about/TheHistoryofPublicTransportinPreston_3.html [Accessed: 4 Apr 2013].

Prestontrampower, b. (2012) *Preston Trampower - Home*. [online] Available at: http://www.prestontrampower.co.uk/ [Accessed: 21 Mar 2012].

Prestontrampower. (2012) *Preston Trampower - Faq's*. [online] Available at: http://www.prestontrampower.co.uk/index.php/faq-s [Accessed: 17 Apr 2013].

RailRegulations. (2006) *Guidance on Tramways*. [e-book] Railway Safety Publications. http://www.rail-reg.gov.uk/upload/pdf/rspg-2g-trmwys.pdf [Accessed: 16 Apr 2013].

Souter, I. (2001) An analysis of the development of the tramway/light rail concept in the British Isles. *Proceedings of the Institution of Mechanical Engineers*, 215 (3).

Stafford, I. and Ayres, S. (2013) Throwing the Baby Out With the Bath Water? The Impact of Coalition Reforms on Identifying Sub-National Transport Priorities in England. *Local Government Studies*, 39 (1).

Stagecoach. (2013) Columbia Electronic Encyclopedia, 6th Edition, p.1, Academic Search Complete, EBSCOhost, viewed 16 April 2013.

tfl.gov (n.d) *History | Transport for London*. [online] Available at: http://www.tfl.gov.uk/corporate/modesoftransport/londonunderground/1604.aspx [Accessed: 12 Apr 2013].

Torontoenvironment (2010) *Light Rail Transit (LRT) FAQs | Toronto Environmental Alliance*. [online] Available at: http://www.torontoenvironment.org/campaigns/transit/LRTfaq [Accessed: 17 Apr 2013].

Trampower.co.uk (2012) *TRAM Power home | Trampower latest news*. [online] Available at: http://www.trampower.co.uk/news.html [Accessed: 15 Apr 2013].

TriMet (2012) *TriMet Pioneers Use of Double-Layer Capacitors for On-Board Energy Storage in Light-Rail Vehicles*. [online] Available at: http://www.fta.dot.gov/documents/TIGGER_OR-88-0001_TriMet_Portland.pdf [Accessed: 8 Apr 2013].

Unknown. (2013) *United Kingdom Infrastructure*. 2nd ed. London: Business Monitor International.

Walker, J. (2011) *Secondary Sustainability Assemblies: 40 assemblies to inspire and challenge students to take care of their world*. London: Optimus education, p.83.

Smart-survey.co.uk (2013) *Free Online Surveys & Online Questionnaire Software | Smart Survey*. [online] Available at: http://www.smart-survey.co.uk/?ad=nss&gclid=CMrJ97XX1rYCFa7MtAodHm0ADg [Accessed: 19 Apr 2013].

Maps.google (2013) *Google Maps*. [online] Available at: https://maps.google.co.uk/maps?hl=en&tab=wl [Accessed: 19 Apr 2013].

Appendices

1. How far do you live from Preston city centre?			
			Response Total
	0-2 miles		39
	2-5 miles		18
	5 miles+		43

2. How would you travel into the city centre from home?			
			Response Total
	car		24
	bus		22
	train		12
	bicycle		7
	walking		35

3. Have you ever thought about how you could improve your carbon footprint in terms of transport?			
			Response Total
1	All the time, and actively try to lower it		34
2	Sometimes, but not too bothered in the long run		28
3	Think that it is the governments job		7
4	Never think about things like that		21
5	Other (please specify):		10

Examples of the 'other' answers:

- Sometimes and am bothered in the long run
- I feel it is important, but there are more important issues.
- I think I have reduced my carbon footprint by using the train instead of a car journey to Preston from Burnley. I use the bus at most other times when closer to home.

4. Do you think the public transport in Preston should be 'greener' (more sustainable)?			
			Response Total
1	yes		87
2	no		4
3	no opinion/don't know		9

5. Would you use a tram if the route and pricing was competitive with bus travel?			
			Response Total
1	yes		52
2	maybe		40
3	no		8

6. Did you know that a tramway is currently in the planning process for Preston?			
			Response Total
1	yes		31
2	no		69

7. Would you rather see money invested in schemes, such as - widespread cycle lanes and bike lock up stations throughout the city?			
			Response Total
1	yes		47
2	no		33
3	no opinion		20

8. What are your highest education qualifications?			
			Response Total
1	GCSE's		24
2	A-Levels		41
3	Undergraduate degree		26
4	Masters or PHD		2
5	No comment		7

9. How old are you?			
			Response Total
1	18-25 years		53
2	25-40 years		22
3	40-60 years		16
4	60 years+		9

Application for safety and ethical approval for all projects

Faculty of Science and Technology

All undergraduate, postgraduate, commercial and research projects need ethical approval. No field work, experimentation or work with participants can start until approval is granted. The questions below should be completed by the Principal Investigator or supervisor of the proposed project. Where projects involve students, the Principal Investigator is always the supervisor and never the student.

For **undergraduate** and **postgraduate taught** projects: use the questions to identify whether the project should be referred to the relevant Ethics Committee.

- If you answer "No" to questions, then do not apply for approval.
- If you answer "Yes" to **any** of the questions, please discuss them with your supervisor. If your supervisor is confident that you can follow standard forms, protocols or approaches, then your supervisor can approve your application. If your supervisor is not, then the application should be sent for approval.

For **research, commercial and other** projects: use the questions to help compile suitable evidence to support your application.

- If you answer "No" to questions, then your application is likely to be approved quickly.
- If you answer "Yes" to **any** of the questions, please provide evidence relating to the management of the activity. If your approach seems appropriate, then your application is likely to be approved quickly.

Submit the application form and any supporting evidence to an appropriate Ethics Committee. Different committees might have different approval processes.

Principal Investigators, or project supervisors, are responsible for ensuring that all activities fall within the principles set down in the University Code of Conduct for Research and the University Ethical Principles for Teaching, Research, Knowledge Transfer, Consultancy and Related Activities. They are also responsible for exercising appropriate professional judgment in undertaking this review and evaluating the activity according to the criteria laid down in this application. If you are uncertain about any sections of this document, or need further information and guidance, please consult a member of the relevant Faculty/School Ethics Committee.

The Faculty and School Ethics and Safety Committees are to ensure that you comply with the University's ethical principles in the conduct of the activity. Committees can ask for clarification or set conditions for you to meet before approval is granted.

Expiry and review: The principal investigator is responsible for ensuring activities are reviewed. Normally:

- each year: review risk assessments: check for changes to hazards and training refreshers
- after 5 years: review ethics: check for new laws, practices
- closure: dispose of materials and sensitive data properly

Refer to the relevant documents from the following links:

1. Ethical Principles for Research, Consultancy, Practical Work and Related Activities
2. Research Governance (Multiple documents)
3. Health, Safety & Environment (Multiple documents)

1 Project synopsis — Approver: — Cmte number:

1.1 Title	The Preston Tramway network: An assessment on public opinion of the Preston tramway network and the implications involved.									
1.2 Project type	Original research		Research degree		PG taught		UG taught	X	Commercial	
1.3 Short description in layman's terms [no acronyms or jargon]	This undergraduate dissertation project aims to investigate the social, environmental and economic impacts by undertaking mainly quantitative research with a little qualitative research. A survey will be undertaken of everyday citizens in the local area and local businesses to assess the social and economic impacts of the tram network. Other research may include interviews with shareholders of Tramway and Preston city council.									
1.4 Dates	Start: May 2011				End: April 2012					
1.5 School of …..	Built and Natural Environment									

2 Participants

2.1 Project supervisor /principal investigator: name, position and original signature	Project Supervisor: Hannah Neate Principle Investigator: Antony Hodkinson

2.2 Co-workers: names and positions [eg student]	N/A

3 External collaborators

3.1 List external collaborating bodies

Tramway

3.2 Provide evidence of any ethical approvals obtained [or needed] by external collaborators

N/A

3.3 Indicate whether confidentiality agreements have been or will be completed

Read any associated procedures and guidance or follow any associated checklist, and delete, Yes or No, for each characteristic in A) to F) below.

If you respond **No**, then in your judgment you believe that the characteristic is irrelevant to the activity.

If you respond **Yes**, then you should **provide relevant documentation** [including risk assessments] with the application, and cross-reference to it, eg A2 or B9. **Use reference numbers of standard** forms, protocols and approaches and risk assessments where they exist.

A) Does the activity involve field work or travel to unfamiliar places? If Yes: 1. Does the activity involve field work or leaving the campus [eg overseas]? 2. Does the field work involve a 'party' of participants or lone working ? 3. Does the activity involve children visiting from schools?	A) Yes 1. Yes 2. Yes 3. No
B) Does the activity involve humans other than the investigators? If Yes: 1. Will the activity involve any external organisation for which separate and specific ethics clearance is required (e.g. NHS; school; any criminal justice	B) Yes 1. No

agencies including the Police, CPS, Prison Service)? – start this now [CRB clearance process at Loughborough; Uclan contact Carole Knight] 2. Does the activity involve participants who are unable to give their informed consent (e.g. children, people with severe learning disabilities, unconscious patients etc.) or who may not be able to give valid consent (e.g. people experiencing mental health difficulties)? 3. Does the activity require participants to give informed consent? [consent guidance at City U] 4. Does the activity raise issues involving the potential abuse or misuse of power and authority which might compromise the validity of participants' consent (e.g. relationships of line management or training)? 5. Is there a potential risk arising from the project of physical, social, emotional or psychological harm to the researchers or participants? 6. Does the activity involve the researchers and/or participants in the potential disclosure of any information relating to illegal activities; the observation of illegal activities; or the possession, viewing or storage (whether in hard copy of electronic format) which may be illegal? 7. Will deception of the participant be necessary during the activity? 8. Does the activity (e.g. art) aim to shock or offend? 9. Will the activity involve invasion of privacy or access to confidential information about people without their permission? 10. Does the activity involve medical research with humans, clinical trials or use human tissue samples or body fluids? 11. Does the activity involve excavation and study of human remains?	2. No 3. No 4. No 5. Yes 6. No 7. No 8. No 9. No 10. No 11. No
C) Does the activity involve animals and other forms of life? If Yes:	C) No
1. Does the activity involve scientific procedures being applied to a vertebrate animal (other than humans) or an octopus? 2. Does the activity involve work with micro-organisms? 3. Does the activity involve genetic modification? 4. Does the activity involve collection of rare plants?	1. No 2. No 3. No 4. No

D) Does the activity involve data about human subjects? If Yes: 1. After using the data protection compliance checklist, have you any data protection requirements? 2. After answering the data protection security processing questions, have you any security requirements? [Data storage] [keep raw data for 5 years]	D) Yes 1. No 2. No
E) Does the activity involve hazardous substances? If Yes: 1. Does the activity involve substances injurious to human or animal health or to the environment? Substances must be disposed properly. 2. Does the activity involve igniting, exploding, heating or freezing substances?	E) No 1. No 2. No
F) Other activities: 1. Does the activity relate to military equipment, weapons or the Defence Industry? 2. Are you aware of any ethical concerns about the company/ organisation, e.g. its product has a harmful effect on humans, animals or the environment; it has a record of supporting repressive regimes; does it have ethical practices for its workers and for the safe disposal of products?	F) No 1. No 2. No
Note: in all cases funding should not be accepted from tobacco-related industries	

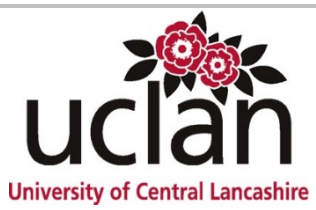
If you respond **Yes**, then you should **provide relevant documentation** [including risk assessments] with the application, and cross-reference to it, eg A2 or B9. **Use reference numbers of standard** forms, protocols and approaches and risk assessments where they exist.

These standard forms are being followed [cross reference to the characteristic, eg A2]:

A1&2 – See Risk Assessment

B5 – See Risk Assessment

D – Qualitative aspects of the research will be undertaken in line with the requirements of the Data Protection and Freedom of Information Acts. The research will not rely on audio, video, photographic or any other recording medium and participants will not be identified from the responses they provide. Informed consent will be sought from all participants in accordance with the guidelines set out in the UCLan: Ethical Principles for teaching, research, consultancy, knowledge transfer and related activities

Health, Safety and Environment Section RISK ASSESSMENT FORM	

Risk Assessment For	Assessment Undertaken By	Assessment Reviewed
Service / Faculty / Dept: SBNE	**Name:** Antony Hodkinson	**Name:**
Location of Activity: Preston	**Date: 20/03/2012**	**Date:**
Survey of public opinion on Preston Tramway **REF: surv2/Black**	**Signed by Head of Dept / equivalent** **Date**	

List significant hazards here:	List groups of people who are at risk:	List existing controls, or refer to safety procedures etc.	For risks, which are not adequately controlled, list the action needed.	Remaining level of risk: high, med or low
A1) Leaving campus to conduct survey	**Antony Hodkinson**	Keeping mobile phone on my person. Watching out for any vehicles when crossing roads.		**Low**

A2) Lone working	**Antony Hodkinson**	Avoid lone working where possible especially if it is in an unfamiliar area, taking a third party to assist with the survey. Always carry fully charged mobile phone for emergency contact. Informing member of family of whereabouts and estimated time of research.		**Low**
B5)Slips , trips and falls when walking	**Antony Hodkinson**	Use of appropriate clothing and footwear. Mobile phones to contact emergency services. Take into account environment and the kind of clothing and footwear required. Carry first aid kit about or know where to receive first aid		**Low**
B5) Cuts and Grazes	**Antony Hodkinson**	Know where to go for first aid, or even carry one about. Make sure tetanus injections are up to date		**Low**
B5) Personal Security	**Antony Hodkinson**	Mobile phone number and information given to friend / family member as to the location of the survey and estimated time of return. If possible taking a third party to conduct surveys for further safety.		**Low**

B5) Weather	**Antony Hodkinson**	Avoid skin exposure even if some cloud cover and use high factor sun block. Stop work if conditions begin to create significant increases in risk. Carry suitable clothing for change in conditions. Be aware of signs of hypothermia and / or sun stroke.		**Low**
B5) Lack of public knowledge	**Antony Hodkinson**	Some members of the public might have not heard of such a project as what I'll be asking about. So I will make sure my knowledge is present about the subject, and carry evidence of progressions around for proof.		**Low**