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The last few months in the UK have seen an accelerated move away from any basic understanding of and commitment to sustainable transport. This has had the effect of making this journal even more important than ever and if any Member of Parliament, local authority councillor, traffic engineer, architect, public health specialist or urban designer would like to be well-informed about the subject labelled as "sustainable transport" it remains the case that they can browse through a few years of our issues and become well-informed.

The UK probably takes the prize globally for the most over-blown rhetoric around sustainable transport and the least impressive outcomes. Our (allegedly) "excellent" performance on road safety is based on a very simple device. We encourage more traffic, we ignore the rampant anti-social behaviour of the majority of drivers, we sit back as walking and cycling decline and as the number of people at risk (not in car) declines we celebrate the success of our road safety interventions. This is, of course, well-known, totally false and misleading and unscientific but such trivia do not get much consideration in public spending and decision-taking.

We ignore our 52,000 dead people every year as a result of poor air quality and this appalling figure includes the 9,000pa in London. We know how to improve air quality but we choose not to do so and when the history of public health and public policy in the last 5-6 decades is written it will reveal a staggering betrayal of public health principles based on the over-riding desire to support the "freedoms" associated with car use.

We ignore our dreadful track record of increasing carbon emissions from the transport sector and hide behind the expensive and illusory attractive options under headings that include "electric vehicles" and "driverless vehicles". We know that fundamental traffic reduction, the promotion of accessibility and a huge increases in walking and cycling have far more to offer to carbon reduction, air quality and reducing death and injury than anything else but we choose to throw billions at early 20th century technology based on 1 tonne of material (the car) carrying 50-75kgs of human being, causing congestion and well designed to kill children at totally inappropriate design speeds.

We spend billions on very poorly justified infrastructure and we have elevated the word "infrastructure" to the level of a mantra that can justify any large scale, new build project regardless of cost and environmental damage and regardless of how much it rewards the rich and does nothing for the poor. The truly dreadful high speed rail project (HS2) sums up this story very well. We all know that the business case and the benefit-cost analysis is deeply flawed and that it ignores due process and methodology around (1) very specific identification of the problem to be solved (2) robust option identification (3) robust, transparent and validated assessment and appraisal of all those options to select the "best" one.

HS2 is a global worst practice example of a decision that has ignored due process. The decision was to build HS2 and not to worry about value for money, sustainability or other options. This in turn has triggered hundreds of millions of spend on unethical consultancy to support that initial baseless decision.

The UK government estimates that HS2 will cost about £57 billion. We all know this is a huge underestimate and the actual cost will be much higher.

HS2 is not an isolated example. The hugely expensive and damaging M4 relief road around Newport in South Wales will cost £1.1 billion for 14 miles of road that seriously damages a protected natural area:

https://www.britishwildlife.com/article/volume-28-number-6-page-387-388

http://www.gwentwildlife.org/how-you-can-help/m4-relief-road-help-us-protect-gwent-levels

The M4 relief road is only one of dozens of new road building projects all of which are based on discredited claims that they will

"reduce congestion, create jobs, rebalance the economy". The Uk government sees no problem at all in proclaiming strong sustainability impulses and supporting walking, cycling and public transport whilst at the same time cutting budgets for these genuinely sustainable modes and destroying our bus services.

Readers of WTPP will realise there is a positive side that we must celebrate. A visit to Freiburg im Breisgau in Southern Germany reveals what things could be like and what sustainable transport really means and how it links perfectly to urban design, renewable energy, a strong economy and a high quality of life:

http://www.vauban.de/en/topics/history/276-an-introduction-to-vauban-district

Every UK politician that has any involvement at all with spending money on any aspect of transport, planning, urban design and public health (mental and physical) should be required to spend 3 full days in Freiburg and at the end of those 3 days, one more day to write 1000 words on what he/she thought about what he/she saw and how the experience can be translated into UK practice. Of course this will not happen. Prejudice, bias, the deliberate rejection of evidence and rationality and "the love of the automobile" are more than enough to help make decisions on how to spend billions of precious taxation revenue (Sachs, 1992)

Every UK firm of transport consultants, barristers and especially QCs earning large amounts of fee income to promote new roads on grounds of economic gain or congestion relief should be required to spend 3 days looking at evidence on these subjects, especially ex post analysis, and agreeing a text that would summarise the evidence rather than promote a biased case for spending public money on flawed schemes.

Every UK politician, transport consultant, barrister and QC should be required to read Flyvbjerg (2017) "The Oxford Handbook of Project Management" and agree a text that summarises the evidence in that handbook e.g. "The iron law of megaprojects":

- 70-90% have cost overruns
- Cost overruns have stayed high and constant for 90 years where we have data
- All 104 countries and 6 continents have cost overruns
- Large benefit shortfalls are common

> "Combine the largest cost overrun and benefit shortfalls with the fact that business cases, cost benefit analyses and social and environmental impact assessments are typically at the core of planning and decision making for mega projects and we see that such analyses can generally not be trusted" (page 9)

This conclusion applies a fortiori to HS2, the M4 relief road in South Wales and every large road project in the UK and the eye-wateringly large expenditures, allegedly at a time of austerity, co-exist with massive cuts in bus funding:

> "Funding for buses across England and Wales has been cut by 33% since 2010, and by nearly £30 million in just the last year.
> Over 500 routes were reduced or completely withdrawn in 2016/17."
>
> CBT (2017)

Cuts in bus funds disproportionately hit the young, the old and the poor and damage local transport. The funding for HS2 and the M4 relief Road disproportionately benefit the rich, the consumer of multiple long distance trips and the car driver. This is the reality of socially unjust, regressive spending.

The lack of attention and funding to sustainable transport is also associated with the acceptance of criminal and anti-social behaviour on the part of the majority of drivers and behaviour that deters walking and cycling just as bus cuts deter bus use. A recent survey of road traffic law in the UK including breaches and enforcement reveals a vast amount of law breaking:

Rule 95: Those in England and Wales must not drive if they:

1. Have a breath alcohol level higher than 35 microgrammes /100 millilitres of breath, or
2. Have a blood alcohol level of more than 80 milligrammes/100 millitres of blood.

The Road Safety Information report released by the Royal Society for the Prevention of Accidents in July 2015 revealed:

- 683,651 roadside breath tests were carried out by England and Wales police forces in 2013.
- 12 per cent of drivers or riders tested (71,675 of the 683,651) either failed or refused to take the test.

Rule 96: It is against the law to drive while under the influence of drugs or medicine.

In regards to medicine, drivers should consult with their doctor about whether they should drive when prescribed to any of the following drugs:

- Amphetamine (including Dexamphetamine or Selegiline)
- Clonazepam
- Diazepam
- Flunitrazepam
- Lorazepam
- Methadone
- Morphine or Opiate and Opioid-based drugs (including Codeine, Tramadol and Fentanyl)
- Oxazepam
- Temazepam

How well is the law being enforced?

Statistics obtained by the Institute of Advanced Motorists (IAM) following a request to the Freedom of Information Act regarding all England and Wales police forces revealed more than 400 drug drivers were arrested per month between March and May 2015.

On top of this:

- The Metropolitan Police made 214 arrests in the period covering March 2nd to May 11th — the highest number of drug-driving arrests recorded in the statistics.
- Northumbria Police made 97 arrests.
- Police forces in Cheshire made 70 arrests.
- Police forces in Sussex made 58 arrests.
- Police forces in South Yorkshire made 55 arrests.

Rule 109: All traffic light signals and traffic signs giving orders must be obeyed — this includes temporary signals and signs.

How well is the law being enforced?

A Freedom of Information request by insurance firm esure has revealed the top 20 roads where motorists were caught running a red light in 2015. The results are shown in Table 1 (p6).

Name of road & location	Constabulary	Number of motorists caught running a red light in 2015
A523 The Silk Road, Macclesfield	Cheshire Constabulary	2,552
A610 Nuthall Island, East Bound, Nottingham	Nottinghamshire Police	1,700
A167 Durham Road (South), Gateshead	Northumbria Police	1,543
A56 Great Ducie Street, Junction with Trinity Way, Manchester	Greater Manchester Police	1,459
Victoria Street/Crosshall Street, Merseyside	Merseyside Police	1,458
A34 Kingsway, Junction with Gatley Road, Stockport	Greater Manchester Police	1,349
A635 Manchester Road, Junction with Ashton Hill Lane, Tameside	Greater Manchester Police	1,314
A556 Chester Road, Junction with Dalefords Lane, Sandiway	Cheshire Constabulary	1,160
A6514 Valley Road / Vernon Road, Basford, Nottingham (N)	Nottinghamshire Police	1,130
A61 Upper Hanover Street, Junction with Glossop Road, Sheffield	South Yorkshire Police	1,055
A308 Staines Raod West, Junction Chertsey Road, Ashford	Surrey Police	977
Northway (A59)/ Hall Lane, Maghull	Merseyside Police	887
Crosby Road South/Cambridge Road, Crosby	Merseyside Police	883
A127 Southend Arterial Road, Junction with Progress Road, Leigh-on-Sea	Essex Police	863
A27 Upper Brighton Road, Junction with Hillbarn Lane, Sussex	Sussex Police	789
London Road, Oxford	Thames Valley Police	709
A1018 North Bridge Street (N), Sunderland	Northumbria Police	657
A610 Nuthall Island, West Bound, Nottingham (W)	Nottinghamshire Police	639
A24 Buck Barn crossroads, Sussex	Sussex Police	610
Ladymead, Junction Woodbridge Road, Guildford	Surrey Police	559

Table 1: top 20 roads where motorists were caught running a red light in 2015.

Rule 124: The maximum speed limit for a road and for a vehicle should never be exceeded. These speed limits are as follows, unless otherwise stated:

Vehicle type	Built-up area	Single carriageway	Dual carriageway	Motorway
Cars and motorcycles (car-derived vans up to two tonnes maximum laden weight included)	30mph	60mph	70mph	70mph
Cars towing caravans or trailers (car-derived vans and motorcycles included)	30mph	50mph	60mph	60mph
Buses, coaches and minibuses (though not exceeding 12 metres in overall length)	30mph	50mph	60mph	70mph
Goods vehicles (though not exceeding 7.5 tonnes maximum laden weight)	30mph	50mph	60mph	70mph*
Goods vehicles in England and Wales (when exceeding 7.5 tonnes maximum laden weight)	30mph	50mph	60mph	60mph
Goods vehicles in Scotland (when exceeding 7.5 tonnes maximum laden weight)	30mph	40mph	50mph	60mph

Table 2: UK speed limits by vehicle type and road category

How well is the law being enforced?
Following a Freedom of Information Act request to police forces across Britain, LV= car insurance found that each police force recorded an average of 56,080 speeding offences in 2015.

This is an eight per cent increase year-on-year when compared to 2014 (there were an average of 52,028 speeding offences recorded that year) and a rise of 20 per cent compared to 2013 (when an average of 46,905 speeding offences was recorded).

The results of a Freedom of Information Act request also found the information shown in tables 3 and 4 below.

Road	Police force	Number of speeding offences recorded
M6	Cheshire Constabulary	12,442
M25 Junction 5	Kent Police	12,330
Scotland Road, Liverpool	Merseyside Police	11,760
M6 Toll Road	Warwickshire Police	10,858
A358	Avon and Somerset Police	10,338

Table 3: Top five hotspots for speeding in 2015

Road	Police force	Speed
A556	Cheshire Constabulary	147mph
A31	Hampshire Constabulary	144mph
M25	Kent Police	142mph
A1	Lincolnshire Police	142mph
A4146	Thames Valley Police	142mph

Table 4: Fastest drivers caught by police forces in 2015

Rule 141: Unless indicated to do so, you should never drive in a bus lane during its period of operation.

How well is the law being enforced?

There were at least £30 million in fines and an estimated one million penalties for bus lane infringements made by councils in 2014, a Freedom of Information request made by The Times has found.

Council	Number of fines
Glasgow City Council	131,238
Birmingham	73,534
Manchester	77,240
Leeds	64,758

Table 5: Councils which issued the highest number of fines throughout 2014

The research carried out to produce these statistics was carried out by "Van Monster".

http://www.vanmonster.com/en-gb/home

In summary we have a UK traffic and transport paradigm (Whitelegg, 2016) based on prioritising the car and truck over any aspect of public health (air quality, death and injury) and supported by a rejection of copious amounts of evidence showing that new road building does not eliminate congestion. It is a system based on prejudice and bias and its outcomes are huge increases in carbon, air pollution, death and injury and congestion. It is further supported by its impact on walking, cycling and bus use, all of which are in decline.

We do not think that this "perfect storm" of intended and unintended consequences is limited to the UK and we invite submissions from other countries evaluating and assessing transport policies and spending across all areas of impact including fiscal.

In this (rather late) issue of WTPP we continue to promote the shift to a new paradigm that celebrates people and not infrastructure, is socially just, delivers huge public health gains, is based on the assumption we can achieve zero death and injury on roads, zero air pollution and zero carbon, is fiscally responsible and not regressive and promotes accessibility rather than mobility.

We have an article by Arie Bleijenberg commenting on a review we carried in our last issue of his splendid book "New mobility. Beyond the car era". Like many policy-oriented scientists around the world the author knows that the "car era" is on the way out and a brighter future is on offer. Melecki Khayesi offers us a valuable insight into best practice in urban transport and how grounded theory can help and Asif Khan, writing from a New Zealand perspective, reminds us that a simple tool like "travel plans" can change behaviour

and accelerate the transition to a sustainable transport future.

The word of truly sustainable transport is very much alive and well and vigorous. It has a huge number of positive examples of what worked well and what brings about the greatest amount of progress, at a much lower cost, across all traditional social, economic, ecological environmental and fiscal dimensions. We also know that the opposite of sustainable transport is still dominant and powerful but like all ideas and concepts that are well past their sell-by dates the old mobility paradigm is breaking down and will be replaced by a new socially just and accessible paradigm. When this happens it will be a bit like when we abolished slavery and when we decided to equip UK cities and their burgeoning populations with piped, clean, safe drinking water and sewage disposal. We cannot and do not understand why slavery received so much high level support from so many intelligent people and we cannot understand why sanitation took so long to be adopted in all UK cities. It will be the same with transport. We will not be able to understand why so many people clinged to the idea that millions of us rushing around in one tonne of metal to destinations that are increasingly far away could ever have been thought to be intelligent.

John Whitelegg
Editor

References:

CBT (2017) Bus funding cuts, Campaign for Better Transport
http://www.bettertransport.org.uk/campaigns/save-our-buses/bus-cuts/text

Flyvbjerg, B (ed) (2017) The Oxford Handbook of Project Management
https://global.oup.com/academic/product/the-oxford-handbook-of-megaproject-management-9780198732242?cc=gb&lang=en&

Sachs, W (1992) For the love of the automobile. Looking back into the history of our desires
https://www.ucpress.edu/book.php?isbn=9780520068780

Whitelegg, J (2016) Mobility
https://networkdispatches.wordpress.com/2015/09/01/mobility-john-whitelegg-lights-a-fire/

Travel Plan as a Tool to Change Young Adults' Attitudes toward Cycling
Asif Khan

Abstract:
This study reviews the travel plans of all the universities in New Zealand to examine the measures proposed to remove the barriers to cycling and the use of motivators for changing the attitudes of the students toward cycling. The findings could be useful for preparing new university travel plans or updating the present ones and influencing the modal choice of young adults.

Key words: Travel plan, cycling, university, modal share and New Zealand

A review of the impact of the Standard Gauge Railway (SGR) on Kenya's national development
Evaristus M.Irandu

Abstract:
Since its introduction during the Industrial Revolution, railway transport has played a key role in economic development of nations. With time, railway transport became increasingly unresponsive to technology and market opportunities thereby being overtaken by other more efficient modes especially road transportation in moving freight. However, the last three decades or so have witnessed renaissance of railways in most parts of the world. Today, railway transport has been modernized and uses high-speed trains averaging about 250 kph in Europe, North America and Asia. Africa has lagged behind in modernizing its railway transport largely relying on the old and dilapidated infrastructure built during the colonial era.

The main objective of this paper is to discuss the likely impact of the Standard Gauge Railway (SGR) in contributing to the development of Kenya. The positive and negative impacts it may have on the Kenyan economy are examined. This is necessary because the dilapidated and inefficient Kenya- Uganda Railway was a colonial railway which did not contribute much to Kenya's socio-economic development. The paper adopts an exploratory approach as this is the first time the SGR has been developed in the country and its likely impacts are not clear.

Key words: Economic development: Kenya: Standard gauge

Unanswered questions on best practices in urban transport policy: how can grounded theory be of help?
Meleckidzedeck Khayesi

Abstract:
The dominant approach to developing theory in transport research which largely advances a priori propositions, which are then tested, is found wanting in the case of practices in urban transport policy. The framing of this issue does not reflect a serious engagement with the complexity of global, regional, national, provincial and local issues associated with the production of knowledge and practices in specific cities. The literature has not adequately addressed such key questions as: Are the factors leading to these practices unique to specific cities or are they generic? Under what circumstances can these practices be replicated? This paper proposes the use of the grounded theory methodology (GTM) to develop a theory and conduct empirical analysis to address key unanswered questions on generation and transferability of knowledge on best practices in urban transport policy. GTM is appropriate because it is not generated a priori and then subsequently tested; instead, it is inductively derived from the study of the phenomenon under consideration. The phenomenon is discovered, developed, and provisionally verified through systematic data collection and analysis. This approach offers transport researchers the possibility of approaching the complexity of best urban transport experiences in different spaces "theory-less".

Keywords: Grounded theory; successful and best practices; transfer; transport policy; theory-less.

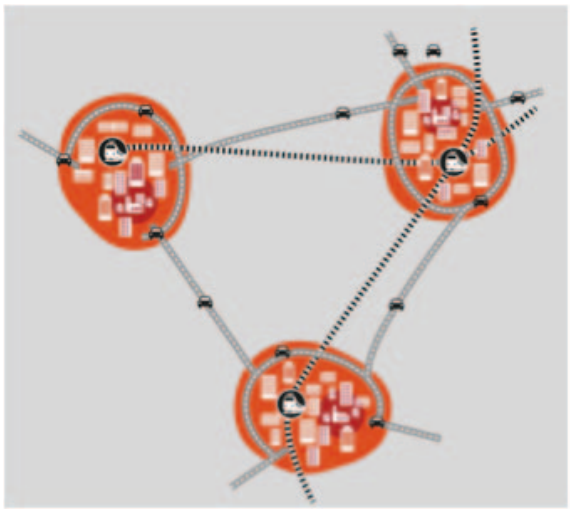
The tide is turning
Arie Bleijenberg

In the May issue of WTPP, the reviewer of my book 'New Mobility – beyond the car era', praised it for giving weight to a much-needed new mobility paradigm and criticised it for downplaying the role of public transport. In this comment, I want to stress the urgency of a change in transport policy, for mainly economic reasons. And mass transit plays its part in this. Policy makers should realize that the tide is turning.

The decades with a strong growth in car travel are over, in the wealthy countries with a mature motorway grid. English people travelled in 2015 on average 11% less per car than in 2000. Even if the coming years might see some growth, the decades of the 1960s and 1970s with an annual growth of around 4% will not return. There are indeed good reasons to expect an end to car growth. Most important is that the car system is now mature in wealthy countries. The average car speed is roughly stable for two decades now and stopped rising after the current density of the motorway grid was reached. Continued urbanization and the strong growth in air travel are two other reasons to reduce car growth. I elaborate on all three in my book. It is important to realize that the computer models mostly used for mobility forecasts, do not, or only partly, incorporate these three developments. So, these models are not suitable to predict the coming changes in mobility.

The end of car growth has a strong impact on spatial developments, because the car allows for a scattering of economic and social activities. The car promotes suburbanization, while rail and aviation enforce urbanization in the vicinity of stations and airports. The urban revival many countries witness nowadays, is partly caused by the end of the centrifugal force of growing car travel. So, wealthy countries entered a time without car growth and with intensified urbanization.

If policy makers do not realize that the tide is turning, they will most likely continue their now outdated habits, by focussing on congestion relief om motorways and on new infrastructure capacity between cities. This promotes a Los Angeles type of spatial development in low density, as illustrated in the left picture. This urban spread is economic inefficient, is unattractive for workers in the new economy and does not grab the opportunities of the changing times.



Instead, the focus in transport policy should shift towards better mobility opportunities within the existing cities and urban conurbations. It is inside the cities, that a mobility backlog exists, for people in urban areas spend 10% to 20% more time on travel than others. And 85% of all trips are shorter than 20 km. A reversed priority towards enhancing mobility within cities, will stimulate urban density (right picture) and is of crucial importance for a vibrant urban and national economy. This policy choice goes with the new flows.

All over the world, it can be witnessed that large cities only become and remain accessible with a smart combination of road traffic, mass transit and biking. The table

illustrates the large difference between urban and rural mobility. So, urban mobility requires completely different policies from non-urban areas! This implies that public transport must deliver better mass transit in the growing urban conurbations. And the main reason to do so, is to strengthen the economy.

	London	Berlin	Major city	Rural area
Average trip length	4 km	7 km	10 km	15 km
Car speed	9 km/h	25 km/h	35 km/h	50 km/h
PT speed	9 km/h	18 km/h	25 km/h	35 km/h
Trip share car	36%	31%	50%	70%
Trip share PT	54%	26%	10%	5%
Trip share walking and cycling	8%	43%	35%	25%
Travel distance /person, day	10 km	20 km	30 km	40 km
Car distance /person, day	3 km		25 km	35 km

Through its strong impact on travel behaviour, urbanization also contributes to reducing greenhouse gasses from transport. Mobility related emissions of CO2 are roughly 25% lower for people living in cities than for others. However, transport emissions should go down much further. Clean technology will deliver the lion's share of the required cuts in carbon emissions from transport. So, much tighter environmental standards for vehicles, in combination with increased urban density will make the Paris goals for mobility achievable in wealthy countries.

Travel Plan as a Tool to Change Young Adults' Attitudes toward Cycling

Asif Khan

Introduction

It is well documented that too much dependence on cars is leading us to an unsustainable travel behaviour. The outcomes are multi-faceted including traffic congestion, environmental pollution, reduced social capital, and sedentary lifestyle. One way of getting out of this situation is a modal shift to active modes, such as cycling, for short to medium trips. Cycling is a sustainable mode of transport from all the perspectives of sustainability. It takes much less road space to move one person than a car. The parking space requirement is much less as well. It generates zero emission. It provides an opportunity to interact with people. Depending on the level of cycling per week, it can take care of physical activity requirement for an individual. The cycle is much cheaper to operate and maintain than a car. Despite all these benefits of cycling, people usually do not choose to cycle in Auckland or other cities of New Zealand.

In a survey of 1048 people in Auckland, it was found that 20% had access to cycle and half of them cycled at least once a month (IPSOS, 2013). Among those who cycled once a week, and termed as a regular cyclist as per the study, 56% belonged to the 35-64 age cohort. The proportion of 15-34 age cohort was 15% less. The latter cohort contains young adults aged between 18 and 25. It can be reasonably assumed that young-adults cycle less regularly than the people aged 35-64. This study considers them an important group regarding cycling. It is because this is the age when they become more independent and take their own decisions, compared to the stage when they were at school. A significant proportion of young adults is likely to study at tertiary institutions including universities. They are unlikely to afford to own and maintain a car. Given their circumstances, they have the potential to cycle more regularly. Measures could be taken to change their travel behaviour, even if it results in a switch from the bus mode. Cycling has greater benefits compared to riding buses, and the space freed by them on the bus during peak commuting time would make buses less crowded and more attractive to other commuters. If people in this age group use cycle for commuting, there is also a possibility that they would carry on this habit beyond their tertiary education life.

One of the tools for altering the travel behaviour of university students is a travel plan. Many universities have adopted travel plans to modify the travel behaviour of the staff and students and achieve desired transport outcomes. This study examines the travel plans of all the eight universities in New Zealand to compare the measures in place regarding cycling. This will help to form a comprehensive understanding of the actions related to cycling and act as a guide to prepare new travel plans or revise the old ones.

Motivators for and barriers to cycling

For more students to commute to the universities by cycle, it is required to change their attitudes toward cycling. We need to identify the motivators for and barriers to cycling and incorporate them into the travel plans for changing their attitudes. Measures should be in place to use the motivators and remove the obstacles. Fear of safety and traffic are the primary reasons why people do not want to cycle (Transport for London, 2012). Other barriers include weather, lack of safe parking at origin and destination, lack of cycle lanes and showers (Nkurunziza, Zuidgeest, Brussel, & Van Maarseveen, 2012). In some countries, there are personal barriers, such as social status.

Among the motivators, health and enjoyment are prominent (Heesch, Sahlqvist, & Garrard, 2012). A study of students and staff at The University of Sydney found that slightly less than half of the participants who used active modes were likely to meet the weekly recommended physical activity requirement of 150 minutes, compared to 39% who travelled by car and public transport (Rissel, Mulley, & Ding, 2013). Other motivators include lower bicycle price, cycling training, and non-elongated routes (Nkurunziza et al., 2012). Among all the influencers and obstacles mentioned thus far, we only do not

have control over the weather. Rest of the issues have the potential to be addressed.

There is limited research on campus travel. Results from an empirical research demonstrate that distance from the campus has a bearing on the use of bicycles for commuting. Shanon et al. (2006) conducted a survey of staff (1170) and students (1040) at the University of Western Australia in Perth. They divided the area surrounding the campus into three zones. Zone 1 was within 1km, Zone 2 between 1-8km, and Zone 3 beyond the 8km distance from the campus. They termed Zone 1 and 2 as walkable and cyclable distances respectively. They found that about 23% students who lived in Zone 1 cycled to the campus, while 10% in Zone 2 and 2% in Zone 3, giving an overall modal share of 7% for cycling. Among the reasons cited by the students against travel behaviour change, weather (rain, wind, and heat) was rated highly. The list of motivating factors for travel behaviour change had travel cost saving at the top. Fitness improvement and contribution to improving the environment were rated quite highly. These factors are associated with the consideration of cycling as a commuting mode option. The cyclists identified a cycle repair and education service as a possible action to promote cycling besides the usual interventions (e.g., cycle lockers). Authors of another study in an Australian university indicate that carrot approaches to cycling alone may not be enough to encourage university population to cycle (Rissel et al., 2013). Some stick approaches, such as making car parking expensive and difficult, are needed as complementary measures. However, this is likely to be truer for the staff than the students as it was found in the survey that the staff made twice the car trips to The University of Sydney compared to the students.

Balsas (2003) examined how a switch from cars to other modes, particularly cycle and walking, was inspired in eight campuses in the US through a survey. Six of the campuses had a bicycle and pedestrian committees and four had a full-time coordinator, who looked after the interest of the cyclists and pedestrians. Three campuses had bicycle plans. Four carried out a regular survey of users. The periodic survey can track the increase or decrease in the number of users and reveal the effects of different policies and actions. These universities needed to arrange fund for investment in cycle infrastructure, including paths, lanes, shower facilities, parking racks and lockers, and salary payment for the coordinator. The fund came from different sources, such as student fees, bicycle registration fees, alumni association, and parking infringement. To attract students living slightly further, the author suggests for bicycle racks on buses serving the campus and argue that campuses are the ideal places to introduce the bicycle lending programs. Providing information on cycling through web pages, brochures and maps are also highlighted.

Travel Plans in New Zealand Universities

There are eight universities in New Zealand. Three of them are located in the major city, Auckland. They are, University of Auckland (UoA), Auckland University of Technology (AUT), and Massey University (MU) (ARTA, 2007; Massey University, 2012). Two have campuses in Christchurch – Lincoln University (LU) and University of Canterbury (UC)(University of Canterbury, 2014). Victoria University of Wellington (VUW), University of Otago (UO), and University of Waikato (UW) have campuses in the capital city of Wellington, Dunedin and Hamilton respectively (The University of Waikato, 2010; Victoria University of Wellington, 2008). Besides Auckland, MU has a campus in Palmerston North.

University travel plans represent not only the policies and actions related to how people travel to and within the campuses, but they also act as a guide for the students, staff and other travellers. Therefore, they should be readily available to the public. UoA and AUT have adjoining campuses in the heart of the city and share a travel plan. MU, VUW, and UW have separate travel plans. UC has specifically a cycle plan instead of the travel plan. UO does not have a travel plan document yet, rather information related to a travel plan have been presented on a web page. No travel plan was readily available for Lincoln University. Probably it is not felt that LU needs a travel plan (TP) due to the low

student enrollment and traffic situation in Christchurch, which is better than what it is in Auckland or Wellington. Information related to these travel plans are presented in Table 1.

The University of Auckland is the oldest and largest university in New Zealand, as per student enrollment, with a figure above 33,000. Apart from LU, all the other universities are similar in size, with more than 10,000 students. It is important to have travel plans developed based on a survey of students. First, it points out the issues that need to be addressed. Second, it provides the base data, which can be used to track the impact of the travel plan with further surveys to be carried out later. All the travel plans are based on empirical evidence. UC leads the way in this regard by administering regular surveys since 1960.

Name of University	No of students (EFT, 2013)	Title of the travel plan	Whether based on any survey?
University of Auckland (UoA)	33,028	The Universities' Travel Plan 2007-2016: A TravelWise project for the Learning Quarter	Yes
Auckland University of Technology (AUT)	18,837		
Massey University (MU)	19,074	Albany Travel Demand Management Plan 2012	Yes
Lincoln University (LU)	3,238	_	_
University of Canterbury (UC)	12,108	University of Canterbury Cycle Plan: 2014-2022	Yes
Victoria University of Wellington (VUW)	17,227	Victoria University of Wellington Travel Plan	Yes
University of Otago (UO)	18,896	The Campus Travel Plan 2010	Yes
University of Waikato(UW)	10,094	The University of Waikato Travel Plan for the Hillcrest Campus	Yes

Table 1: Basic information related to the travel plans of eight universities in New Zealand
Source: Developed from the websites and travel plans of respective universities.

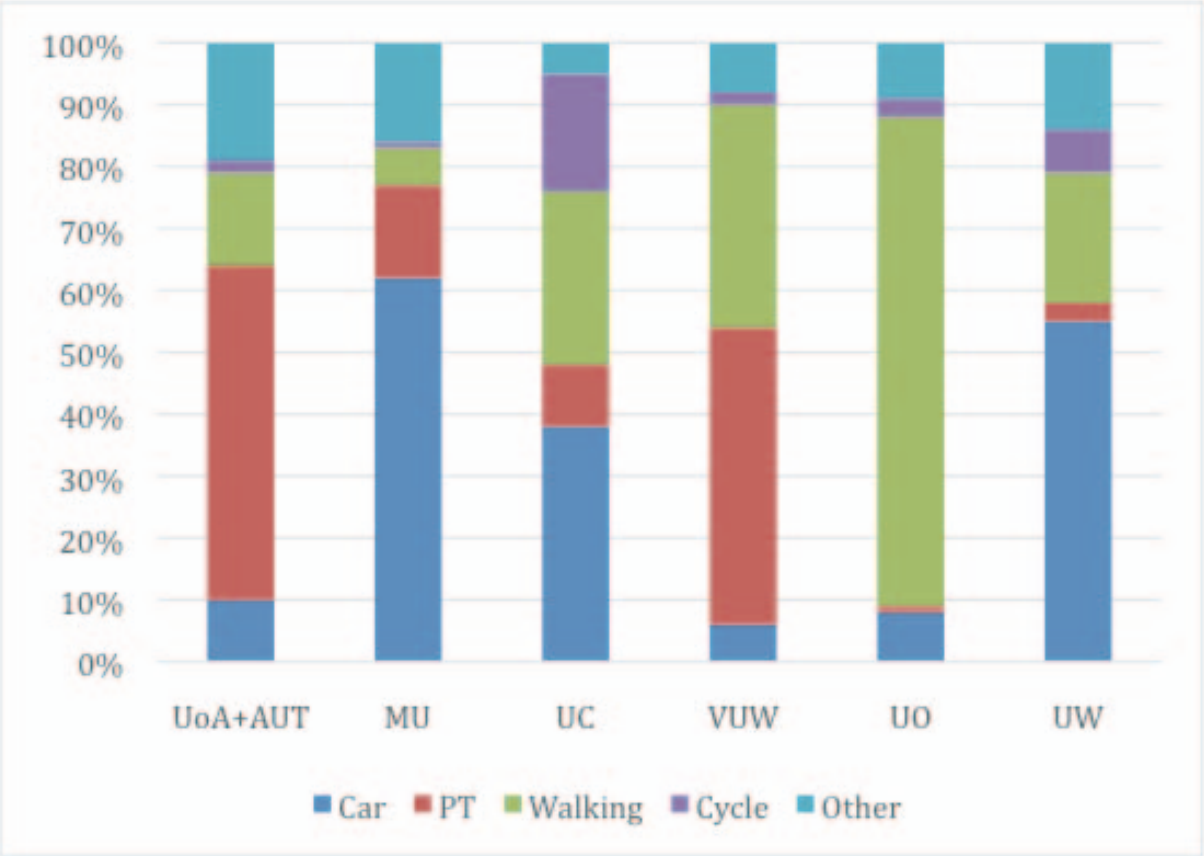


Figure 1: Students' modal share for commuting to the University
Source: Developed from the figures of surveys presented in respective travel plans.

Figure 1 shows students' modal shares for commuting to the university. Car trips represent Single Occupant Vehicle (SOV) trips. The other category includes a passenger in a car, motorcycle, taxi, and responses not indicating any mode. There is a huge variation in the figures. A large proportion of students drove to the Albany Campus of Massey University (62%) and University of Waikato (55%). This is quite surprising, but as the numbers of postgraduate students are not known, it cannot be guessed that it was one of the factors. Whatever the reasons, if these two universities want more students to adopt sustainable modes they need to minimise car use through parking controls. University of Auckland and Auckland University of Technology, and Victoria University of Wellington have many students commuting by public transport with shares of 54% and 48% respectively. This is not surprising given that they are located in the heart of the CBDs of two major cities of New Zealand and served by reasonably good and improving public transport services. The University of Otago has a sustainable campus already from transport point of view, as 79% walk to the campus. The University of Canterbury demonstrates the highest percent of students cycling to the campus. The figure is quite high at 19%. UW follows it with 7% commuting to the Hillcrest Campus by cycle. Other universities have a lower share, with figures between 1-2%. This shows there is a potential for increasing the uptake of cycling in almost all the universities in New Zealand.

Measures associated with influencing the motivators and removing the barriers to cycling across the universities are discussed under following sub-sections.

Measures and actions related to removing barriers

Table 2 represents the measures and actions that are in place in the travel plans to remove barriers to cycling to the campuses. The measures have been selected from the literature review, and any new measure has been included under 'other' type.

Measures and actions related to motiva-

	Cycle path/lanes	Safe parking	Shower and other facilities	Others
UoA & AUT	• Review potential for New cycle lanes • Improve road surface • Connectivity with local and regional cycle network	• Cycle racks • Secure & sheltered parking	• Access to shower facilities	-
MU	• Safer routes for cyclists can be done • Investigate options for improving safe access on and off site for cycling	• Investigate options for providing cycle storage facilities & lockers	-	-
UC	• A network of cycle routes in a hierarchy of major off-road cycle paths and shared paths, and connected to the city's cycleway networks	• More use of better cycle-stand design • Covered cycle stands	• Showers, lockers, drying facilities and bike maintenance facilities (24/7) at bike hubs • Upgrade existing showers and add new showers • Changing facilities with an iron and ironing board	• Dr Bike provides free limited bike maintenance and repair service once a week. • Bike maintenance sessions
VUW	• Work with the City Council to improve cycle safety on the streets including improved cycle routes	• Poor design of present cycle parking acknowledged and to be changed to a better one • Further explore the provision of secure cycle storage	• Shower facilities to be improved mainly for pedestrians, which would benefit cyclists	• Use the additional revenue generated by the increased parking costs to fund other initiatives, such as locker facilities and cycle racks
UO	-	-	• Improve cycling facilities on and off campus	-
UW	• Lobby Hamilton City Council for more cycle lanes in the surrounding areas • Improve cycle routes on campus.	• Install additional secure cycle storage facilities on campus (covered and locked storage)	• Showers are available for free, but all for staff. So, provide access to students.	-

Table 2: Measures and actions related to removing barriers

Source: Developed from respective travel plans and mostly presented without any change from the way they were stated in these documents.

tors for cycling

Table 3 represents the measures that are in place in the travel plans to motivate students to cycle to the campuses. The measures have been selected from the literature review, and any new measure has been included under 'other' type.

Discussion

The manner in which cycling aspect is dealt with in the travel plan document, depends on existing modal split, how far the students live, and local conditions. Modal share for walking was 79% at UO. It is meaningless to make the pedestrians switch to cycling in this case. An important consideration is students' residential location. People usually do not use the cycling mode for commuting if they live more than 8 km away. It is going to give better results if the students living within 8 km catchment are targeted for modal shift to cycling. Hamilton has flat terrain, which is conducive to cycling, but Wellington is not due to hilly terrain. All the travel plans should, therefore, be based on local information and travel behaviour data. In this respect, UC leads the other universities by administering regular surveys since the 1960s. Surveys help to pinpoint where the problems originate. Surveys at a regular interval enable to monitor the impacts of policies and measures adopted in the travel plan and provide insight into further steps that need to be undertaken. Once the travel plan is in draft stage, consultation with the students is quite important, as the success of the plan greatly depends on the cooperation received from the students.

Cycling route improvements are important steps for removing barriers to cycling. Many people perceive cycling to be unsafe. In order to change their attitudes towards cycling, it is necessary to make them feel safe by providing safe cycle paths and cycle lanes. Universities need to take steps regarding both on campus and off campus cycle routes. For the latter type, universities need to negotiate with the authority, which in most cases in New Zealand is the local council. For the internal cycle routes, it was found that UC aimed to avoid conflict with pedestrians, rightly acknowledging the dominance of pedestrians on campus. UC is the only university in NZ to adopt a plan dedicated to cycling. The plan goes into details of cycling, which other travel plans have not been able to. It is not surprising that modal share for cycling (19%) at UC is the highest among all the universities. However, the success of initiatives related to cycling also depends on non-cycling measures, such as carpark control. Since UC does not have a general travel plan, this aspect is missing in their plan. Universities which are serious about increasing cycling could adopt separate cycle plans, supplementary to the main travel plan. Some plans are dependent on the inventory of facilities, which highlight the need for different types of cycling facilities based on accurate information. Regular audits help update the inventory.

Interestingly, cycle parking can have quite a few dimensions. The parking could be of different types including racks, lockers and cages. A few travel plans have given importance to the design of cycle-stands. The location of the parking facilities is a matter of concern at the same time. Cycle hubs are deemed to be the better location for the major parking facilities. The temporary racks could be placed in front of buildings and removed when required. Secured cycle parking can deter theft and is important for changing students' attitude toward bicycle safety.

Shower facilities feature quite commonly in literature covering cycling facilities. It is not surprising that they also feature in travel plans. Cyclists work up a sweat if they cycle a long distance. It will be inconvenient for them if there is no shower facility at the destination. Other complementary facilities with shower have also been considered, such as lockers. One travel plan has even considered providing iron, ironing board and a dryer to lift the image of cycling among the students who have negative attitudes toward cycling. UC can be considered as a role model for NZ universities for promoting cycling among students. It offers a few types of cycle repair facilities and easy access to repair kits, the absence of which might make the potential cyclists concerned.

The universities have not taken any step to organise subsidised cycle for the students. The students are unlikely to be rich and price of a cycle can be a barrier to the uptake of cycling, especially when the students also consider other barriers

	Car parking control	Subsidised cycle/ other	Promotion of cycling	Others
UOA & AUT	• Parking review to identify options for providing incentives for sustainable transport	• None	• Health benefits of cycling to be posted on the website	• Information on the placement of facilities
MU	• Begin planning for eventual introduction of parking charges	• Investigate the use of pool bikes to use between precincts	• Promote location of existing cycle storage facilities and shower facilities	• Investigate opportunities for cycle training • Investigate possibility of guaranteed ride home if cyclists get stranded by urgent circumstances • Develop travel map showing all modes • Investigate Smart phone app for travel options • Information about comparison of cost
UC	-	• Bike hire and sharing scheme using the restored bikes, which were abandoned on campus	• Bike breakfasts • Fashion show on bikes called 'Cycle Runway'	• LCD screen with video tutorials about fixing punctures or giving safer cycling tips at bike hubs • Bike maintenance hub • Signage and marking • Water fountain for water bottle refill facilities • Cycle safety courses • Cycle club
VUW	• Raise the price of parking permits gradually over 3 years period to reach 50% of market value • Increased patrolling to decrease illegal parking • Parking measures associated with increasing costs and limiting permits, but likely to have an impact on staff only	-	• Better promotion of availability of showers • Develop communication plan to promote the initiatives • Develop website content	• Upgrade campus maps
UO	• Minimise the impact of cars on campus by adopting new parking management methods	-	-	• Actively participate in annual events to promote sustainable living, such as Bikewise Week
UW	• Implement paid parking	-	• Promote cycling facilities including showers and bike racks • Promote events during Bike Wise Month • Promote cycling as an attractive travel choice in student orientation process • Use web site and local community press	• Lobby dairies and shops in the general city area to install bike racks • Lobby Hamilton Council to install secure bike parks at bus stops • Work with Cycle Action Waikato • Use portion of parking revenue for sustainable modes including cycling • Join the Green Bike Program

Table 3: Measures and actions related to motivators

Source: Developed from respective travel plans and mostly presented without any change from the way they were stated in these documents.

once they own a bike. UC sets an example here as well, with a bike hire and sharing scheme. In this case, old abandoned bikes on campus would be restored to run this service. Thus, students do not need to own a bicycle to ride one on campus, but they cannot use these cycles for commuting.

Successful travel plans require a combination of carrot and stick approaches. Car use needs to be discouraged to motivate students to cycle more. The methods applied to discourage the use of cars are mainly parking oriented. One way is reducing the number of parking. The other one is introducing parking charges, if not present, and increasing parking charge. In most cases, the money collected would be used for supporting other modes. The steps taken for increasing modal share for cycling are unlikely to bring positive results without an effective campaign. Different universities have adopted different methods for raising awareness about cycling among students. The methods include information and maps provided on the website and putting up signage on campus. Some universities have found one-off programmes quite effective, like a campaign during student orientation or an attention-seeking step like a bike fashion show.

The travel plans of NZ universities have included quite a few aspects to increase the use of cycle by students. However, along with subsidised cycling, none of the travel plans has mentioned about university accommodation as a means to changing travel behaviour. For example, universities can negotiate with house owners to provide residences for the students within 8 km of the campus and take steps to encourage them to commute to the university by cycles from their residence. Despite the importance of cycling for achieving positive health outcomes, the travel plans rarely propose to use it for raising awareness among students. The cost of owning and commuting by a bike could also be compared with the cost of owning and commuting by a car to promote cycle as an attractive mode from an economic point of view.

Conclusion

This study has reviewed the travel plans of seven universities in New Zealand (NZ). They are all mainly located in major cities, such as Auckland, Wellington, Christchurch, Dunedin and Hamilton. Despite all being NZ universities, the travel plans of the universities differ in terms of scope of the plans, depth of the issues considered, the amount of background research, and stage of implementation. However, the aims are quite similar. They all intend to change the mode used by the commuters, including staff and students, from single occupied cars to sustainable modes, such as car pool, public transport, walking and cycling, by changing their attitudes toward different modes. Also, they aim to increase the modal choice of the commuters. In regards to cycling, the measures and actions are mostly consistent with the literature, with the common measures included under removal of barriers to and use of motivators for cycling. There are a few uncommon actions as well.
The study has identified measures which are usually included in the university travel plans for removing the obstacles for cycling and also for motivating students to change their attitude towards cycling, possibly leading to increased cycling uptake among young adults. However, it should be noted that there would always be students who cannot be persuaded into cycling no matter what measures are taken. For example, in the survey of students by the University of Canterbury, it was found that 34% would not consider cycling at all (University of Canterbury, 2014). The findings of this study are likely to be useful for developing a new university travel plan or revising an old one in New Zealand or elsewhere.

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References:

ARTA. (2007). The Universities' Travel Plan 2007-2016: A TravelWise Project for the Learning Quarter. Auckland: Auckland Regional Transportation Agency.

Balsas, C. J. L. (2003). Sustainable transportation planning on college campuses. Transport Policy, 10(1), 35-49.

Heesch, K. C., Sahlqvist, S., & Garrard, J. (2012). Gender differences in recreational and transport cycling: a cross-sectional mixed-methods comparison of cycling patterns, motivators, and constraints. International Journal of Behavioral Nutrition and Physical Activity, 9(1), 106.

IPSOS. (2013). Auckland Transport Cycling Research. Auckland: Auckland Transport.

Massey University. (2012). Albany Travel Demand Management Plan. Auckland: Massey University.

Nkurunziza, A., Zuidgeest, M., Brussel, M., & Van Maarseveen, M. (2012). Examining the potential for modal change: Motivators and barriers for bicycle commuting in Dar-es-Salaam. Transport Policy, 24, 249-259.

Rissel, C., Mulley, C., & Ding, D. (2013). Travel Mode and Physical Activity at Sydney University. International Journal of Environmental Research and Public Health, 10(8), 3563.

Shannon, T., Giles-Corti, B., Pikora, T., Bulsara, M., Shilton, T., & Bull, F. (2006). Active commuting in a university setting: Assessing commuting habits and potential for modal change. Transport Policy, 13(3), 240-253.

The University of Waikato. (2010). The University of Waikato Travel Plan for the Hillcrest Campus. Hamilton: The University of Waikato.

Transport for London. (2012). Attitudes Towards Cycling: Annual Report 2012. London: Transport for London.

University of Canterbury. (2014). University of Canterbury Cycle Plan 2014-2022. Christchurch: University of Canterbury.

Victoria University of Wellington. (2008). Victoria University of Wellington Travel Plan: Vic Commute. Wellington: Victoria University of Wellington.

A review of the impact of the Standard Gauge Railway (SGR) on Kenya's national development

Evaristus M. Irandu

1.0 Introduction

Many regions of the world rely heavily on railway transport for their socio-economic development. For example, the rapid growth of industrialisation and trade especially in Europe and, North America has always been facilitated by railway networks. Railway transport which developed during the Industrial Revolution continued to dominate surface transport until the late 1940s. Thereafter, it declined in the face of stiff competition from other modes especially road that had flourished on the momentum of the World War II technology boom (van der Meulen and Fienie Möller..2017).By this time most countries had either nationalised or regulated their railways in order to restrain their monopolistic power. Furthermore, railway transport had already become too unresponsive to technology and market opportunities to be competitive.

However, in the last three decades or so, railway transport has experienced spectacular development in most parts of the world. This development has been witnessed particularly in the use of the modern technology and high-speed trains as well as in the growth of international traffic and multimodal transport. Today's modern economies seek greater mobility of citizens and the movement of larger volumes of freight at lower costs, in safer conditions, and with minimum negative impact to the environment. These new challenges offer railways the opportunity to provide a valid alternative to other modes of transport. In recent years, the railway has experienced renaissance and has attracted huge infrastructural investments in many parts of the world including Africa (van der Meulen and Möller, 2017).

A major issue faced by international development agencies such as the World Bank is how to promote economic development in Africa. According to Kerby, et al, (2014), a considerable amount of the World Bank's recent lending focuses on financing transport infrastructure projects such as railways. Yet little is known about the economic impact of such mega projects (Sequeira, 2013). Hence, there is need for a review of the increasing role and prospects of railway transport in the future, especially the Standard Gauge Railway (SGR) which is gaining popularity in Africa. Understanding the impact of railway transport carries some important lessons in order to plan future infrastructure investments in Africa and other parts of the world.

The main objective of this paper is to discuss the likely impact of the Standard Gauge Railway (SGR) in contributing to the development of Kenya. The positive and negative impacts it may have on the Kenyan economy are examined. This is necessary because the dilapidated and inefficient Kenya- Uganda Railway was a colonial railway which did not contribute much to Kenya's socio-economic development. The paper adopts an exploratory approach as this is the first time the SGR has been developed in the country and its likely impacts are not clear.

This research is significant because it examines the role of Standard Gauge Railway in promoting socio-economic development of Kenya at a time when the. Metre Gauge Railway (MGR) constructed more than 100 years ago has been deteriorating and performing dismally. The paper contributes to the existing scanty literature on the role of Standard Gauge Railway not only in Kenya but in the whole East African Community (EAC) region. The research findings will assist policy makers in formulating effective polices to address emerging issues especially after the new railway system has operated for a number of years. The findings can also be applied in other mega-infrastructure projects of cross-border significance.

2.0 Global overview of the emergence of Standard Gauge Railway

According to Sweat (2008), the predominant gauge in operation in North America, Europe, the Middle East, and China is the standard gauge. The standard gauge accounts for about 62 percent of the world's total railway network (Sweat, 2008). Today, China, France, Germany, Italy, Japan and Spain have some of the most exten-

Gauges Type	Width(mm)	Major countries/Regions	Proportion of world total
Broad Gauge	1524-1676	India, Pakistan, Sri-Lanka, Brazil, Argentina, Russia, Chile, Portugal, Former USSR, Finland	15
Standard Gauge	1435	UK, USA, Canada, Japan, China, Kenya	62
Cape Gauge	1067	Southern Africa, Northern Africa, Middle East, New-foundland, Australia and New Zealand	8
Metre Gauge	1000	India, France, Argentina, Switzerland, East Africa	9
Others (e.g. nar-row gauge)	610-914	India, China, Colombia, Guatemala, Ireland	6
Total			100

Table 1: Distribution of Railway gauges in the World
Source: Author, compiled from various sources

sive high-speed rail systems in the world. The first high-speed rail line opened in Japan for the 1964 Olympics. Europe's first high-speed rail line opened in Italy between Rome and Florence in 1978. In Europe, each country's national rail company operates high-speed rail service. These operator-owned trains serve several countries creating a seamless network. For example, France's TGV line also operates in Belgium (Feigenbaum, 2013.)

3.0 Development and Impact of Colonial Railways in Africa

Africa's colonial railway network started taking shape in 1852 in Alexandria, Egypt, with most main branch lines completed by the 1920's. These railways were very expensive to build. In building the railways the colonisers did not necessarily select locations of high economic potential; but rather the cheapest or shortest route to the sea (BBC, 2017). This was the case with the Kenya-Uganda railway which was built in 1901 to connect the landlocked Uganda to the coast at the lowest possible cost (Plate 1). Plate 1 shows the laying of the Kenya-Uganda railroad at Kisumu Terminus (then named Port Florence). Kenya was considered as a transit territory; with the railway bypassing highly populated areas en route to Uganda. In Ghana, the purpose was to connect European owned mines and for military domination within West Africa. The railway provided an advantage to the locations it passed through. However, in the African context this advantage disappeared over time. Railway transport systems collapsed after independence due to mismanagement, lack of maintenance and the dominance of road transport.

Plate 1: Florence Preston, the wife of the engineer building the Kenya-Uganda Railway, drove the last nail in the last sleeper of the railway by the shores of Lake Victoria on December 20th, 1901. The arrival of the railroad signaled the development of Port Florence (now Kisumu Port, Kenya).
Source: Dominic DeSanto, "The Kenya-Uganda Railway," MaCleKi | Curating Kisumu, accessed September 7, 2017, http://macleki.org/items/show/8.

It has long been observed that the transport infrastructure of developing countries and that of former African colonies in particular, have an interior-to-coast spatial pattern. As Rodney (1982) observes, the colonisers built railways that facilitated the export of natural resources, but these were not suited for the needs of local and regional trade. Various writers have pointed out that colonial infrastructure has persisted over time, and that its interior-to-coast orientation contributes to explaining the former colonies' limited regional integration and disappointing economic performance (Sachs et al., 2004).

It has also been argued that the primary motivation of colonialism in Africa was purely for economic gains. To achieve these gains, basic infrastructure, especially transport needed to be provided. The British colonial authorities throughout Africa were aware of the importance of modern transport towards achieving maximum political, social and economic stronghold of their colonies (Jedwab, and. Moradi, 2012; Obiakor and Agajelu, 2016). With the anticipation and discovery of various produce centres in the hinterlands it was clear that the railway system, which played a leading role in industrial Europe, was needed in the African colonies. One of the major reasons for the construction of colonial railways in Africa was to promote trade. In Ghana, railway transport led to a drastic reduction in transport costs, which made cocoa production for export markets profitable. This made Ghana the world's largest exporter as early as 1911. The rural population also increased along the railway lines because cocoa cultivation required more labour; creating villages. Cities also emerged because villages accessed towns as trading centres. At Independence in 1957, locations along the railway line were more urbanised and economically developed, which persists even at present (http://www.theigc.org/blog/what-policymakers-can-learn-from-africas-colonial-railways)).

Kenya has important similarities with Ghana. The Uganda Railway running from Mombasa on the Kenyan coast to Lake Victoria is a case in point. Railway transport could cut transport costs by 90-95%. As a result, many people who earned their livelihoods as porters were put out of work because of it. Another reason for building colonial railways was to develop commercial agriculture to provide abundant, regular and cheap agro-based raw materials for manufacturing industries in Europe. The Uganda Railway influenced the location of European settlers, which in turn decided the location of the main cities of the country at independence. Railways declined and settlers left after independence. Most locations are now accessible by road. Coffee production was the main export of the colony and the engine of growth in the European areas, collapsing in the 1980s, owing to lower international prices. Locations along the railway line thus lost their initial advantage in terms of transport, human capital and agriculture. Yet, the ranking of these cities persisted. Indeed, the ease of accessing a hospital, secondary school or a police station today depends on the colonial railway investment made more than a century ago (Kerby et al, 2014)..

The purpose for railway construction was basically the same throughout colonial Africa. For example, it can be argued that the boom in diamond production in South Africa led the Colony's economy to rely heavily on rail transport. The Cape railways were built to connect Kimberley with the international economy and to allow Kimberley's economy to boost and increase its population. By reducing the cost of transport to the interior, the railway eased the movement of labour, capital goods, foodstuffs and other necessities to the diamond mining centers and transformed the Cape from a traditional agrarian economy to a diamond exporting power and a center of attraction for immigrants (Taaffe et al., 1963; Fourie, and Herranz-Loncan, 2015; Greyling and Verhoef, 2015; Okoye et al, 2016).

Although the relationship between transport and economic development has always been contentious, colonial authorities in Africa believed that investments in transport infrastructure positively influenced economic development. This explains the preoccupation of these authorities with railway and road building projects throughout the continent. Colonial authorities were informed by regional and industrial development theories, which assigned

a critical role to transport costs (Pedersen, 2001). At the time, transport costs were considered as a leading factor explaining the location of economic activities. This view prevailed for about a decade during the post-colonial era. However, from the early-1970s to the mid-1980s, following the revelation by a number of empirical studies that this relationship may in fact be negative or inverse, transport lost its appeal as a critical determinant of economic and regional development (Pedersen, 2001).

The role of railway transport in Africa's development path has been reviewed by a number of scholars (Njoh, 2007 and Kessides, 2004, Veseley, 2001). In order to understand the role of colonial railway transport in Africa's development, it is important to appreciate how it all began. According to Njoh (2007), the relationship between transport and economic development has always been contested by various scholars, but when it came to Africa, colonialists deemed that investing in transport would positively influence economic development and also cost saving. This assumption saw the colonialists investing in railway building projects all over the continent (Njoh, 2007).

Under colonial rule the main intentions of colonialists were to penetrate the hinterland of Africa where they could extract raw materials and then transport them by rail to the seaports and off to their host countries. According to Njoh (2007), for the colonialist to achieve their objectives, rail transport presented itself as the optimal means as well as that of military defending the colonial territory" (Njoh, 2007). .Furthermore, rail transport was cheap to develop, offered higher returns to their investments and it was easier and cheaper to transport bulk goods as compared to road transport. Moreover, Africa's colonial railway system was unconnected. Architects of the colonial-era lines had little regard for interconnection. They adopted a variety of gauges and standards that balkanized the continent and reinforced technological isolation (Africa Policy Institute, 2016).

Njoh (2007) argues that Africa's marginalized position within the global economic system is mainly due to the fact that the continent lacks the quality and quantity of transport infrastructure necessary to connect it to the global arteries of commerce and industry (Njoh, 2007). Njoh (2007) further observes that, despite railway being a relatively inexpensive means of transport, it has also been neglected. He further points out that whatever few tracks were inherited from the colonial governments they have been barely maintained and in some cases left in a state of disrepair. Besides, few if any extensions have been made to the rail lines inherited from the colonial era. Thus, just like during the colonial era, African countries continue to be isolated from each other (Njoh, 2007). Kessides (2004) argues that most African countries' railroads are still vertically and horizontally integrated state monopolies which are still under government control. According to Takundwa,(2014) this monolithic structure of operating railways has resulted in most freight operations across the continent operating below capacity and experiencing capacity constraints.

Veseley (2001) further argues that post-colonial governments were to blame because of mismanagement, and lawlessness. Njoh (2007) looks at Kenya as a case study to illustrate how an effective and efficient railways network deteriorated due to mismanagement, neglect and obsolescence. According to Njoh (2007), Kenya was once the best railway network that provided safe passage to Rwanda, Uganda, Burundi and the Democratic Republic of Congo. However, as Curtis (2009) notes approximately 30% of the length of the rail corridor in Kenya, is currently in poor condition and in need of rehabilitation.

Since the mid-1980s, and particularly after the revelation that investments in public infrastructure contributed to economic development in industrialized countries (Aschaeur, 1989, 1990; Eberts, 1990), the importance of transport to development has once more been recognized (Pedersen, 2001). This suggests that a region's ability to succeed in the contemporary global economy depends largely on the effectiveness and efficiency of its transport system.

4.0 Challenges facing Railway transport in Africa

Advancement of any country depends on the quantity and quality of its transport system. Rail transport contributes to the socio-economic development of African countries as it facilitates access to markets, jobs, health care, education and leisure activities (Salim, 2003) and Lingaitiene (2006). The development of sustainable rail transport which meets the mobility and access desires of African people and businesses and at the same time reduces greenhouse-gas emissions is the goal of every African government. Therefore, there is need to overhaul the increasingly inefficient and dilapidated railway network inherited from the colonial past in the continent (African Union, 2017).

As can be observed from table 2, the current dilapidated Metre Gauge Railway handles a mere 5.5% of the total traffic handed in the Northern Corridor, while only about 6.2% of the total traffic moved along the Central Corridor moves by rail. Road transport handles the bulk of traffic along both Corridors. Most lines can accommodate only relatively lightweight and slow-moving trains, and poor maintenance over a long period of time has caused many sections of the track to deteriorate, in some cases almost beyond repair, resulting in a loss of competitiveness and rolling-stock productivity. Rehabilitating these railway networks will be expensive; finding a sustainable way to do this given the low traffic volumes and revenues that exist today is the central problem faced by most Sub-Saharan African railways (African Union, 2017).

It would also be noted that there are some ongoing and completed projects for railway construction and upgrading to accommodate high speed trains in the countries of Angola, Ethiopia and Morocco. In East Africa, Kenya has launched a new high speed railway from Mombasa which is to extend to South Sudan, Democratic Republic of Congo (DRC) and Burundi. The cost of the railway will be US$5.2bn and will be mostly funded by China.

5.0 Railway development policy in Kenya

Kenya like many other Anglophone countries has been utilising the gauge track of 1, 000 mm (3 ft 3 3⁄8 in) (metre gauge). The reason was that when the British started the railroad construction at the end of the nineteenth century they utilized material and workers from India. The Indian gauge and rolling stock was 1,000 mm (3 ft 3 3⁄8 in). The mainline of the Kenya Railways is based on the original Kenya- Uganda Railway (KUR). Its 930 km (578 mi) main track connected the Indian Ocean port of Mombasa to the port of Kisumu at Lake Victoria. Half way is the capital of Nairobi that was founded as a rail depot of the Kenya- Uganda Railway. The British added

Corridor	Type of Traffic	Road	Rail	Total	Rail Share (%)
Northern Corridor	Transit	5509	417	5926	7.0
	Regional	2974	151	3125	4.8
	Domestic	11817	622	12439	5.0
	Total	20300	1190	21490	5.5
Central Corridor	Transit	357	111	468	23.7
	Regional	658	32	690	4.6
	Domestic	5617	296	5913	5.0
	Total	6632	439	7071	6.2
Grand Total:		26932	1629	28561	5.7

Table 2: Northern and Central Corridor traffic by type of mode (000 tons) , 20132
Source: EAC. 2013. A Regional Transport Intermodal Strategy and Action Plan in the Countries of the East African Community, Draft Technical Report 1-Revision 1, Table 2.5, Page 9.

several branch lines as well as a link to Tanzania and a link to Uganda. The total railway system eventually had 2,778 km (1,726 mi) of track. By about 2006 much of the overall railway system had been neglected or was in disrepair.

The Metre Gauge Railway (MGR) that has been operated in Kenya for over 100 years uses old technology; trains have low speeds averaging 22 kph for freight and about 40 kph for passengers and also has low payload because of using short trains. Hence the East African Community has come up with an East Africa Railway Master Plan which aims to adopt the standard gauge railway (SGR) technology. Kenya is implementing its part as outlined in the master plan. Government of Kenya (GoK) plans to construct the SGR from Mombasa to Kisumu and Malaba in two phases. Already, phase I running from the Port of Mombasa to the Capital City of Nairobi has been completed at a cost of KES327billion (USD 3.8billion). The construction of phase I was financed mainly by the Chinese Government, with Government of Kenya defraying 15% of the total cost. Plans are underway to commence the second phase. The Government of the Republic of Kenya

Figure 1: Proposed SGR Network Development by EAC Partner States
Source: East African Business Council (EABC). 2016. Investment opportunities for the East African Private Sector under the Northern Corridor Integration Projects., pg 35.

(GoK) has identified transport as one of the key pillars for achieving Vision 2030. This is expected to elevate Kenya to the middle income status by 2030. In order to achieve this objective, GOK intends to build 3,100 kilometers of SGR by 2025 connecting to the rest of the region (Fig 1). The government aims to focus more on new railway infrastructure development since the existing meter gauge railway (MGR) has serious limitations and is unlikely to meet capacity expectations stated in Vision 2030(Wahome, 2015).

The government of Kenya identified the Northern Corridor and the Lamu Port, South Sudan and Ethiopia Transport (LAPSSET) Corridor for the development of a modern and high capacity SGR to transport freight and passengers. The LAPSSET project components consists of development of a Lamu port, railway line, highway, crude oil pipeline and product pipeline, oil refinery, resort cities and airport. The Kenyan Standard Gauge Railway (SGR) Northern Corridor has three main routes which are: the Mombasa to Nairobi (phase I) which is 472 km; Nairobi to Naivasha which is 120 km and then Naivasha to Kisumu and Malaba which is 369 km. The LAPSSET corridor of the Standard Gauge Railway will involve two routes which include: Lamu to Isiolo then Narkod (bordering South Sudan) which will be a distance of 1,350 km; the Nairobi to Isiolo then to Moyale (bordering Ethiopia) which will be a distance of 700 km. Figure 1 shows the proposed SGR lines in East Africa. As already discussed, Phase 1 of Kenya's SGR network is already complete. Plans are underway for the construction of the remaining phases.

The Mombasa-Nairobi Standard Gauge Railway is the biggest infrastructure project in Kenya since independence and will help in shortening the passenger travel time from Mombasa to Nairobi. After Kenya and China signed a financial agreement in May, 2014, China Exim Bank is financing the Kenyan Northern Corridor SGR and the Mombasa-Nairobi phase of the project is estimated to cost USD 3.8

Plate 2: Piers of Tsavo River Super-large Bridge. The bridge is 1987.7m long
Source: China Daily Africa, 28th May 2017
http://www.chinadaily.com.cn/kindle/2017-05/28/content_29534632.htm

billion. The China Exim Bank provided 90% of the financing while the remaining 10% was contributed by the Government of Kenya. The construction of the Mombasa to Nairobi line began in October 2013 and is scheduled to be completed by June 2017 and the Kenya Standard Gauge Railway section will create approximately 30,000 jobs during the construction. The SGR is designed with an axle-load of 25 tonnes; it is expected to haul up to 22 million tonnes of cargo annually at a speed of 80-100km per hour, although passenger trains are expected to achieve speeds of up to 120km per hour (Plate 2).

The Nairobi–Malaba SGR Project (Phase 2) has been divided into three sub-phases and will include Phase 2A (Nairobi–Naivasha), Phase 2B (Naivasha–Kisumu), including the development of a new high capacity port at Kisumu, and Phase 2C (Kisumu –Malaba). The new railway runs almost parallel to the existing Mombasa-Nairobi transport corridor. It deviates in some areas from the existing line in order to attain a relatively straight alignment to enhance speed. The railway traverses eight (8) Counties namely: Mombasa, Kilifi, Kwale, Taita-Taveta, Makueni, Kajiado, Machakos and Nairobi. It has a total length of 485km. The SGR is one of the flagship projects of Kenya's vision 2030.

Plate 3: A passenger locomotive on the newly completed SGR from Mombasa to Nairobi.
The new railroad was nicknamed the Madaraka Express because the first passenger train reached Nairobi on the eve of Madaraka day (Self rule) celebrations.
Source: https://espresso.economist.com/2ea19e760aeeeeeb813a2406d0d31a25

The single-track non-electric Standard Gauge Railway (SGR) is now hosting freight trains that can travel at speeds of nearly 80 kilometers per hour and passenger trains that can travel up to 120 kilometers per hour from Mombasa to the Nairobi South Railway Station in Syokimau. (Wissenbach and Wang, 2017). This mega infrastructure project is a case of a strategic government-to-government project with major implications for Kenya's economy. It involved construction of a super large or Mega Bridge across the Tsavo River (Plate 3).

The single-track diesel fuelled Standard Gauge Railway was built by the Chinese Road and Bridge Corporation (CRBC) under a government-to-government agreement. It was financed largely through Chinese loans.. The Standard Gauge Railway is only one out of many Chinese-built infrastructure projects in Kenya, but it is by far the most strategic and politically salient investment. The colonial-era railway carries only 0.9 million tons of cargo annually from the Indian Ocean into landlocked cities in Kenya and Uganda, compared to the Mombasa port's throughput of 22 million tons in 2013 at a snail's pace, but it is expected to continue to operate. The new Standard Gauge Railway, built mostly alongside the existing track, but without the winding bends, is meant to substantially increase cargo throughput by rail and to lower transport costs and time by as much as 60%.

The lack of a strong rail infrastructure impedes growth. Existing roads cannot cope with the increasing volume of freight hauled through the Mombasa port to places as far as the DRC and Rwanda. This author observed hundreds of thousands of trucks move back and forth on a single 520 kilometer road between Nairobi and Mombasa. Often, thousands of trucks stall for hours in traffic at the entrance of Mom-

basa to reach the port. Accidents are frequent, and road maintenance is costly. In optimistic scenarios, train stations could lead to the establishment of economic clusters, especially economic zones (SEZ), or business parks, although there is currently little evidence that zoning, let alone construction, for such parks has started. For instance, an economic zone (SEZ has been proposed to be built in Naivasha to justify extending the Standard Gauge Railway phase 2.

The Standard Gauge Railway is the biggest infrastructure project ever undertaken in Kenya and the East African Community (EAC) region. It is intended to improve the movement of goods and passengers between the Port of Mombasa and its hinterland of Kenya, Uganda, Rwanda and parts of eastern DR Congo. An efficient transport system will not only improve Kenya's but the region's competitiveness as an investment destination. As Zhao (2016) argues, the Standard Gauge Railway will make goods sold in the region cheaper, making the cost of life affordable for households. Further, recognizing the critical significance of the project, the first phase of the SGR project has been implemented with utmost sensitivity to the socio-economic needs of the Kenyan society and long-term sustainability in mind (Kithinji, 2016).

The Kenya-Uganda Railway (KUR) the predecessor of the Standard Gauge Railway was originally built by the British at the turn of the last century to open up the interior and provide access to overseas markets for goods especially cash crops from the vast hinterland. Besides, a closer examination of the map of Kenya reveals a clear linear pattern to urbanization, with the railway line being the common denominator among Kenya's urban centers. The Standard Gauge Railway is expected to promote more urban development and stimulate greater regional development in the areas where it will traverse.
Majority of the workers hired by the Chinese contractor came from Kenya. This created job opportunities for the local population living along the Standard Gauge Railway line. It was estimated that a single kilometer of the Standard Gauge Railway line was expected to create at least 60 new job opportunities during the construction phase. The job opportunities will be of great benefit to the country based on the new skills acquired in skilled and semis-skilled labor which can be used during the future expansion of the projects to other parts of the country. As Kanyua (2014) observes, some of the local industries will benefit from the project due to the inputs demanded at the construction site Overall, the opportunities brought by the SGR project to the country will be enormous and will have a along tern impact on the socio- economic development of Kenya. The benefits of the SGR are summarized in table 3.

6.0 Materials and methods

6.1 Research Philosophy and design

This study assumed a realist approach, because this is an approach that retains many of the ambitions of positivism but recognizes, and comes to terms with the subjective nature of research and the inevitable role of values in it (Colin 2010). The researcher believes that this approach was useful in this study because the study focused on realistic information. The approach was influenced by the fact that the subjects being investigated were independent from the researcher's beliefs and views. The research uses a descriptive and qualitative analysis design using both primary and secondary data where by primary data were obtained through interviews and secondary data obtained through document reviews at Kenya Railway Corporation (KRC) offices.

6.2 Sample size

According to Pfeiffer (1994) in statistics and quantitative research methodology, sample means a portion or part of the population under study which represents the whole population in a study. Population for the study consists of the officials working in the Kenya Railway Corporation (KRC) at various departments. For this study, the sample was drawn from the head office of Kenya Railway Corporation (KRC). The researcher obtained a list of available departments in Kenya Railway Corporation (KRC). These are the departments responsible for transporting cargo and passengers.

Economic Benefits	Reduced cost of transport hence lower cost of doing business in the country and the region. This encourages investment
	Additional 1.5% to annual GDP growth during construction and operation;
	"First mile" and "last mile" transport services
	Reduced congestion at Mombasa Port by providing fast, efficient and reliable transport so that goods arriving at port are moved to hinterland without delays
	Business opportunities to locals through supplies during construction stage
	Reduced costs of road maintenance
	Enhanced freight security in transit
	Job creation- at least 60 new jobs created per kilometre of track during construction period
	Local Industries -large quantities of local inputs such as cement, electricity generation and electricity transmission pylons and cables, roofing materials, glass, etc. required from local industries with potential to create at least 10,000 jobs
	Reduced loss of tax revenue due to cargo diversion
	Enhanced freight security in transit
Social Benefits	Service and hospitality industry: estimated 3,000 jobs to provide foods, accommodation and leisure
	Skills development: estimated 15,000 people to acquire skills suitable for self employment after the construction period (masons, carpenters, mechanics, electricians, etc.)
	Technology transfer: estimated 400 engineers and high technology technicians will be trained during construction and will be available for local and regional railway development after construction of the Mombasa – Nairobi railway
	Accidents reduction: reduced number of heavy trucks on the road and so reducing accident incidents making the roads safer for freight and human traffic
Environmental Benefits	Protects environment through reduced carbon emission

Table 3: Benefits of the Standard Gauge Railway
Source: Slightly modified from Wahome, V. 2015. Impact of the Standard Gauge Railway (SGR) and LAPSSET development Corridor to the Kenyan Economy, Kenya Railways Corporation (KRC), Mombasa

Yamane (1967:886) proposed the use of simplified formula to calculate sample size of the study. This is the formula used in this paper. The formula is as shown below:

n = N / (1 + Ne2)

This is the formula adopted in getting the sample of this study. Where: n = number of sample, N = total population, e = error tolerance or level of confidence. Then: N = 100, e = 10%, n =? From the formula: n = 100 / (1+100*0.12) = **50**. Therefore: n = **50**

6.3 Data collection and analysis

Data for this study was obtained from secondary sources and primary data obtained through purposeful sampling of Kenya Railway Corporation (KRC) officials, cargo handlers and transport operators based at the Port of Mombasa. A total of 50 people were interviewed- 10 transport operators, 30 cargo clearing and forwarding officials and 10 KRC officials.

6.4 Results and discussion

6.4.1 Role of SGR in national development

The researcher wanted to assess the role of the SGR in promoting economic development of the country. Respondents were asked to give their opinion through scoring some statements that are focusing on assessing the role of the SGR. Four rating scales were given for making a choice. The scales are 1) strongly disagree = SD, 2) neutral=N, 3) Agree = A, and 4) strongly agree = SA. The scores are presented in table 4 below. The responses presented in table 4 appear to tally with what Wahome (2015) observed. The respondents interviewed felt that SGR would lead to greater volume of cargo handled and that such haulage of cargo would be much cheaper. Other respondents felt that SGR would create employment and stimulate further growth in the national economy.

Figure 2 shows the percentages of respondents in various occupations. This analysis was important in order to find out if the data was drawn from participants who had knowledge of the research topic. There were 36% managers, 24 supervisors, 20% specialists (engineers and consultants) and the rest about 20 %(e.g. railway technicians). Figure 3 reveals that more respondents (50%) strongly agreed that rail transport is more carbon efficient than other modes. Less than 10% strongly disagreed. The question was concerned with the environmental impacts caused by rail and other transport modes.

Respondents were asked to state whether shifting freight to SGR would reduce the cost for road maintenance. As shown in Figure 4, 42% strongly agree, 28% agree, 8% disagree and 22 % strongly disagree with the notion that increased use of rail transport will reduce cost of road maintenance. Figure 5 shows that 48% of the respondents strongly agree that rail transport is cheaper than road transport and it can reduce demurrage, whereas 18% strongly disagree. This question asked respondents to compare costs of moving goods by SGR with those by road transport mode. The results show that the majority of participants agree that rail transport costs are more competitive.

The results displayed in Figure 6 show an interesting pattern. Although a slightly higher percentage (30%) of respondents stated that rail transport is currently the preferable mode of transport for freight, 25% strongly disagree. This shows that there was almost an agreement that both modes are equally preferred. This situa-

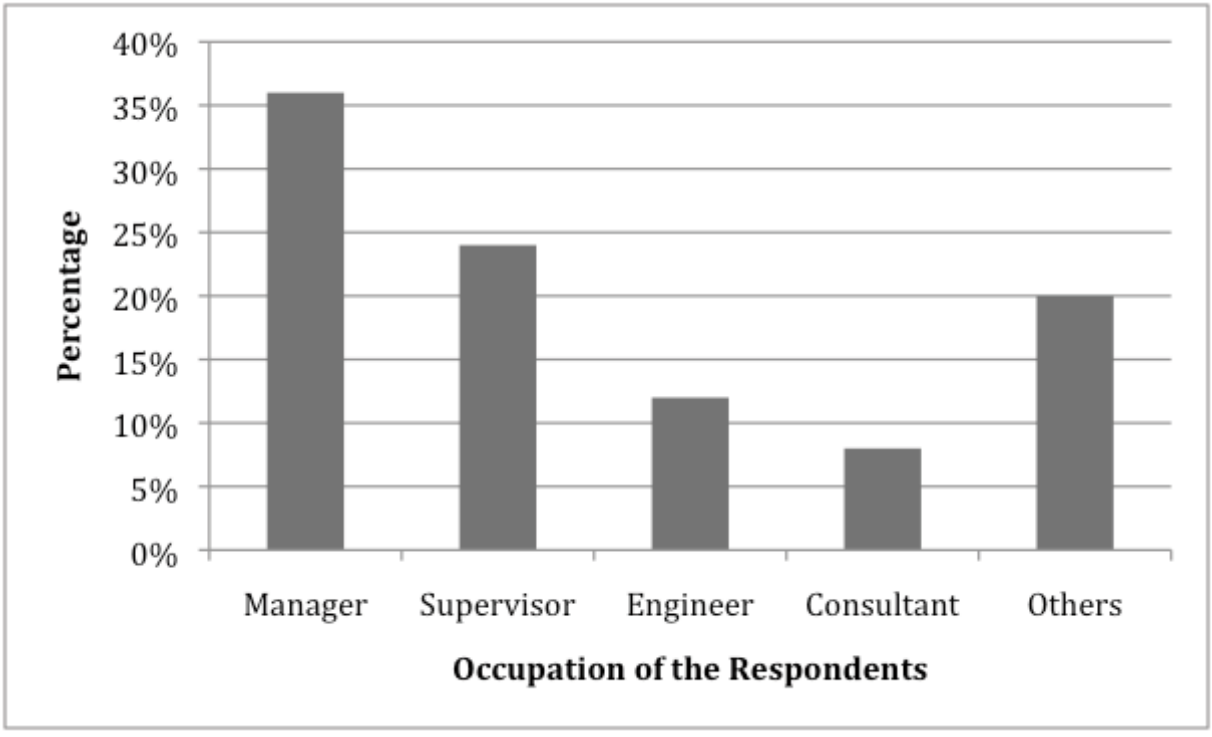

Figure 2: Occupation of the Respondents
Source: Author, 2017

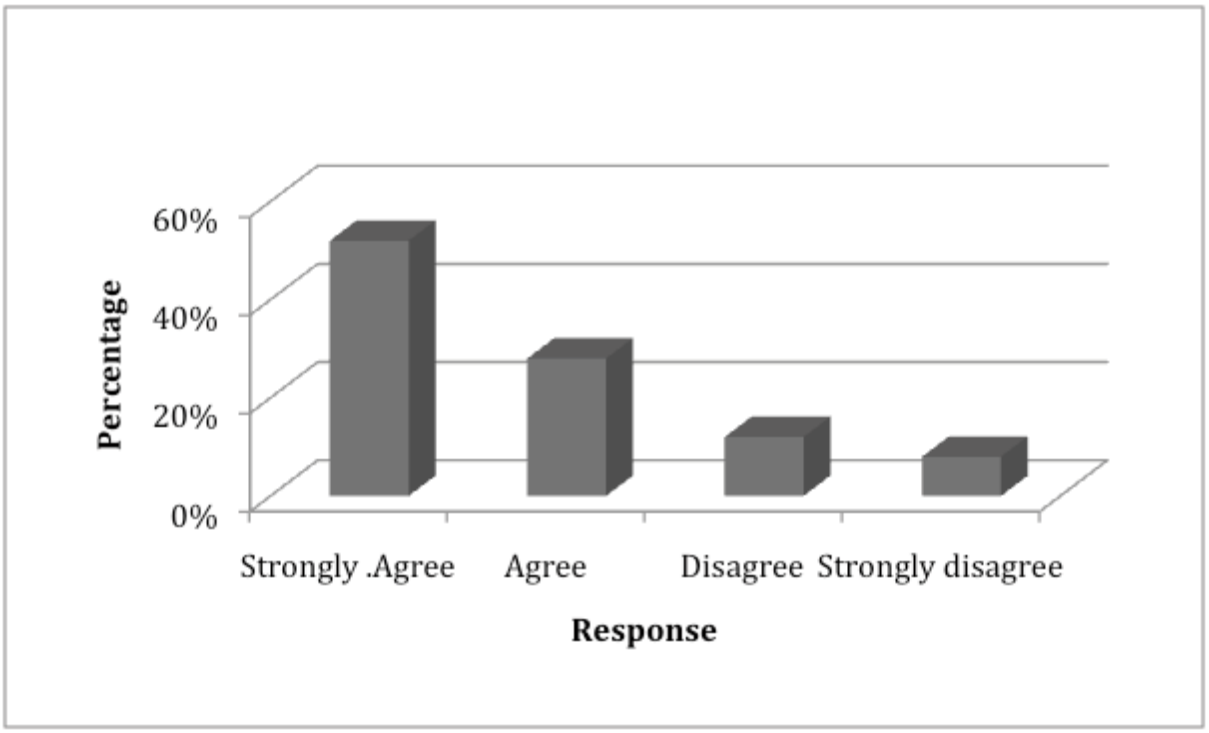

Figure 3: SGR is more carbon efficient than other modes
Source; Author, 2017

tion could have arisen due to the current trend where road transport is a dominant mode in movement of cargo in the Northern corridor. The road cargo transporters have slowly gained the market because of the inefficiency and unreliability of rail transport which is caused by a lack of rail maintenance and modernization.

7.0 Conclusions

From the discussion and analysis provided, it can be concluded that the SGR project is an economically viable project that will promote national development and thereby compensate for the significant investment required in the long run. The Standard Gauge Railway is intended to provide

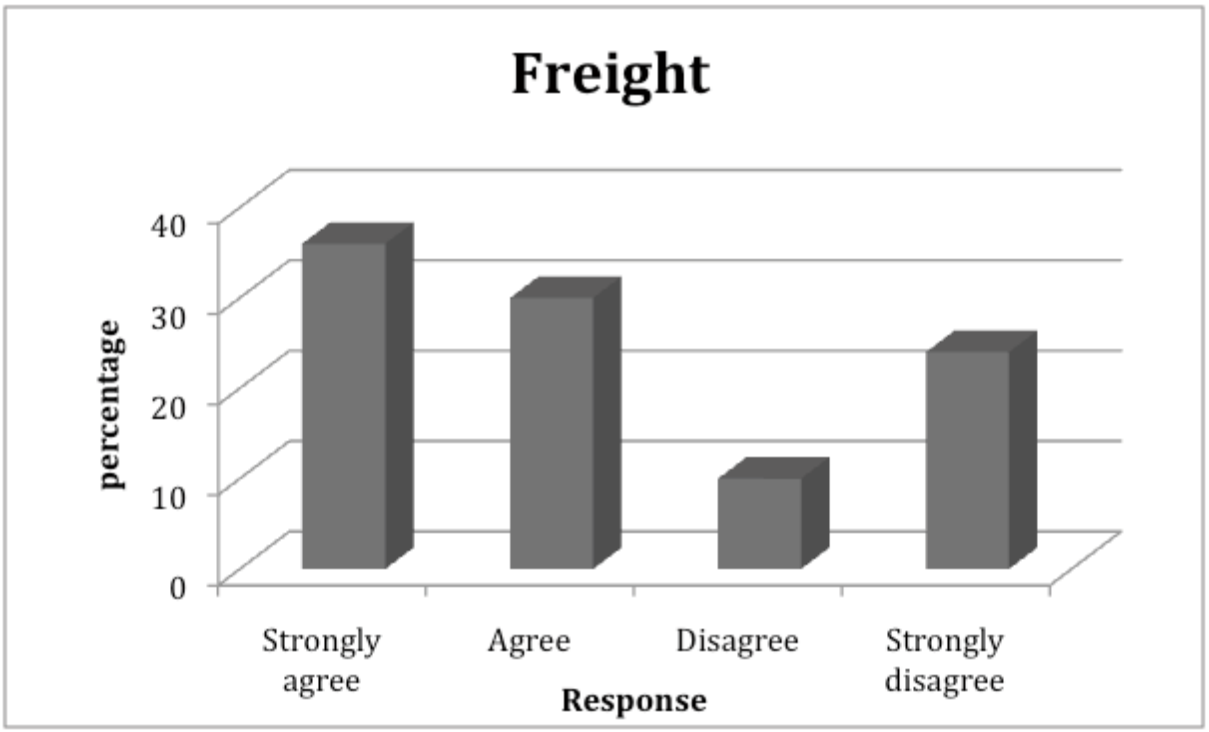

Figure 4: Shifting Road freight to rail will reduce road maintenance cost (%)
Source: Author, 2017

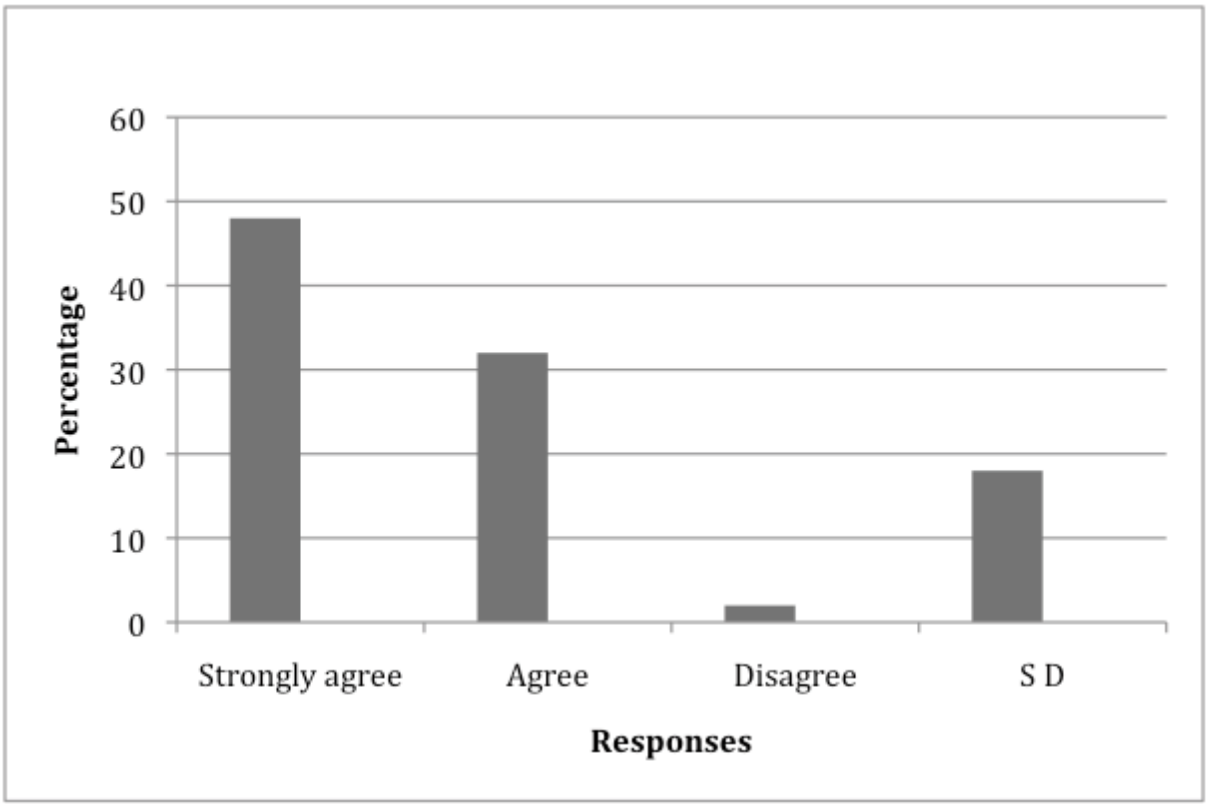

Figure 5: Rail freight transport costs are more competitive than freight road costs
Source: Author, 2017
(SD: Strongly Disagree)

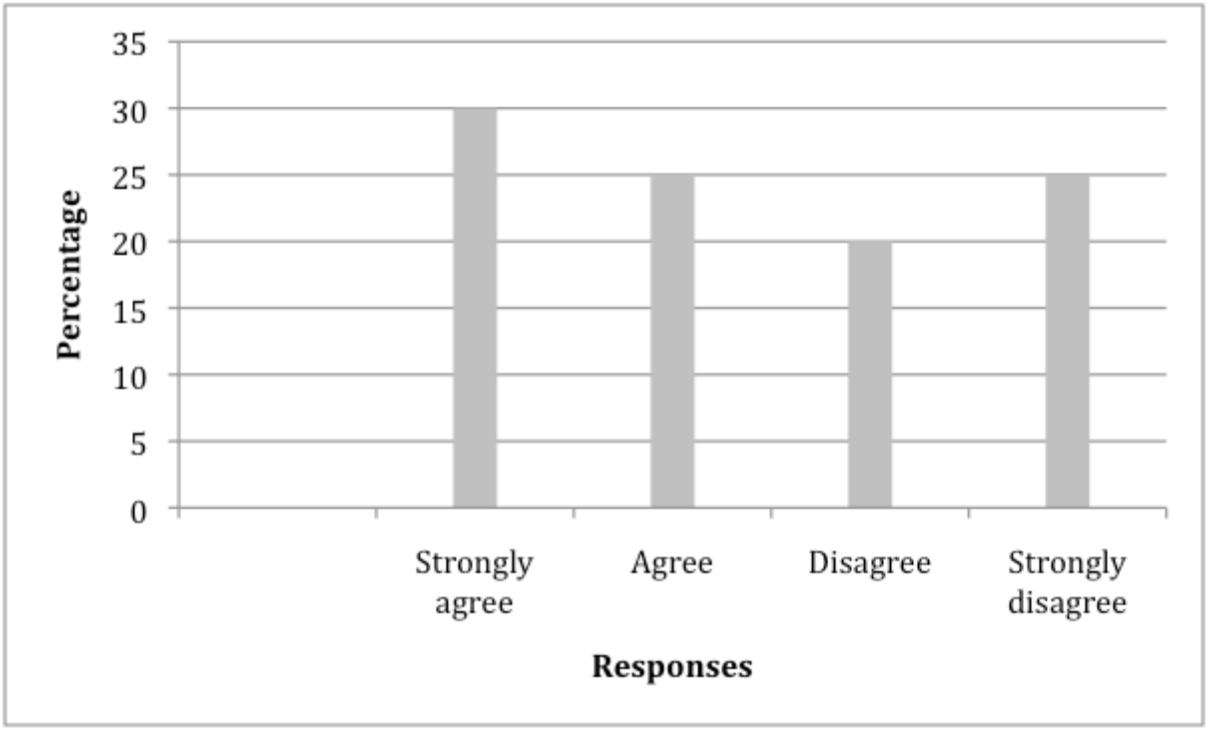

Figure 6: SGR as preferred freight transport mode
Source: Author, 2017

resilient infrastructure, promote inclusive and sustainable industrialisation, foster innovation and alleviate poverty. The role of colonial railways in national development is debatable. It would appear colonial railways in Africa were built to exploit the available natural resources such as minerals and agricultural land. Most of these railway lines were mismanaged; neglected and collapsed at independence. This posed a challenge to post colonial African governments to rehabilitate and/or introduce the Standard Gauge Railway.

The responses of interviewees tended to reinforce and corroborate available literature as far as the likely impact of Standard Gauge Railway on national development in Kenya is concerned. Respondents stated that the SGR will reduce the cost of transport and thus lower the cost of transacting business in Kenya and the whole of East Africa. They argued that it will also confer other benefits such as reducing tear and wear of our roads thereby reducing the cost of road maintenance. The Standard Gauge railway will supplement rather than supplant road transport. The information provided in this paper can be used not only to expand the ambitious Standard Gauge railway project in Kenya but also formulate transport policies that can ensure maximum efficiency and sustainability of future railway and other mega-infrastructure investments in the East African Community Partner States. However, this research is exploratory in nature and further research should be undertaken after say 10-20 years to assess real benefits from investing in mega transport projects such as the Standard Gauge Railway (SGR). This way more information would be obtained that would form a sound basis for policy formulation regarding the operations of railway and other modes of transport in Kenya and the rest of the region.

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References:

Africa Policy Institute. (2017). Kenya's 'Rail Strategy' Will Revolutionize Development. API Research Notes, Issue No. 6, July 2017.

African Union. (2017). Towards the African Integrated High Speed Railway Network Development. AddisAbaba,Ethiopia. http://au.int/web/sites/default/files/documents/32186-doc-towards_the_african_integrated_high_speed_railway_network_aihsrn_development-e.pdf

Amba, D., & Danladi, J. (2013). An appraisal of the Nigerian transport sector: Evidence from the railway and aviation sub-sectors. Journal of Economics and Sustainable Development, 4(10), 161-171.

Aschauer, D.A. (1989). Is public expendi ture productive? Journal of Monetary Economics, Vol.23, 177-200.

Aschauer, D.A. (19900. "Why is infrastructure important?" in A.H. Munnell (ed.). Is there a shortfall in public capital investment? (pp. 21-50). Boston: Federal Reserve Bank of Boston.

BBC. (2017). The Story of Africa: Africa and Europe (1800-1914). Railways. http://www.bbc.co.uk/worldservice/africa/features/storyofafrica/11chapter12.shtml

Colin, F. (2010). Researching and Writing a Dissertation, essential guide for business students, 3th Edition

Curtis, B. (2009). The Chirundu Border Post: Detailed Monitoring of Transit Times. SSATP Discussion Paper 10, World Bank, Washington, DC.

East African Community (EAC). (2013). A Regional Transport Intermodal Strategy and Action Plan in the Countries of the East African Community, Draft Technical Report 1-Revision 1, The World Bank – The East African Community Secretariat , November 12t.h.

Eberts, R. 1(990). Public infrastructure and regional economic development. Economic Review, 1990, issue Q I, 15-27.

Fourie, J. and Herranz-Loncan, A. (2015). Growth (and Segregation) by Rail: How the Railways Shaped Colonial South Africa. ERSA working paper 539.

Glen D. I. (1992). Determining Sample Size , Agricultural Education and Communication Department, University of Florida, IFAS Extension, PEOD6 (Reviewed 2013).

Greyling, L. and Verhoef, G. (2015). Slow growth, supply shocks and structural change: The GDP of the Cape Colony in the late nineteenth century. Economic History of Developing Regions 30, 23–43.

Jedwab, R. and A. Moradi. (2012). "Colonial Investments and African Development: Evidence from Ghanaian Railways," Working Paper, George Washington University.

Kanyua, R. (2014).Benefits of standard gauge railway outweigh its cost. Retrieved from: http://www.standardmedia.co.ke/article/2000103574/benefits-of-standard-gauge-railway-outweigh-its-cost/?pageNo=1

Kerby, E, Moradi, A. and Jedwab, R.(2014). 3 policy lessons from Africa's colonial railways
https://www.theigc.org/blog/what-policy-makers-can-learn-from-africas-colonial-railways/

Kessides, I. (2004). Reforming Infrastructure Privatisation, Regulation and Competition. Oxford University Press.

Kithinji, E. (2016). "The Importance of Standard Gauge Railway (SGR) Project To The East African Region". International Journal of Current Business and Social Sciences, 1 (5), 15-32

Lingaitiene, O. (2006). Application of a general model of multimodal transportation in logistics. Transport and Telecommunication 7(1), 92-96.

Njoh, A, (2007). Implications of Africa's Transportation Systems for Development in the Era of Globalization. Accessed from: http://www.trforum.org/forum/downloads/2007_5A_AfricaTrans_paper.pdf on 20 June 2013

Okoye, D., Pongou, R. and Yokossi, T..(2016). On the Dispensability of New Transportation Technologies: Evidence from Colonial Railroads in Nigeria, WORKING PAPER #1620E, Department of Economics, Faculty of Social Sciences, University of Ottawa.

Olievschi, V. N (2013). Railway Transport: Framework for Improving Railway Sector Performance in Sub- Saharan Africa. SSTP Working Paper No. 94

Pedersen, P.O. (2001). "Freight transport under globalisation and its impact on Africa."
Journal of Transport Geography, 9, 85-99.
Pfeffer, J. (1994). Competitive Advantage through People; Unleashing the power of the work force. Boston: Harvard Business School Press.

Rodney, W.(1982). How Europe Underdeveloped Africa, Revised edition. Howard University Press, Paperback

Sachs, J. D., McArthur, J. W., Schmidt-Traub, G., Kruk., M., Chandrika Bahadur, Faye, M. and Gordon McCord (2004), "Ending Africa's Poverty Trap", Brookings Papers on Economic Activity 1, The Brookings Institution, Washington D.C.

Salim, I. (2003). Security aspects of multimodal transport. In Proceedings of the Expert Meeting on the Development of multimodal Transport and Logistics services, 24-26.

Sequeira, S. (2013). The Impact of Railway Infrastructure on Firm Performance: Evidence from South Africa. International Growth Centre (IGC) , Policy Brief 5018, June 2013.

Sweat, S. D. (2008). Transportation Context of Latin American Logistics, Master of Science in Transportation, Massachusetts Institute of Technology, USA.

Takundwa, D, .R. (2014). Infrastructure Development in Economic Crisis and Recovery: The Rail Cargo Sector in Zimbabwe since 2000. Master's Thesis in Development Studies, School of Development Studies, University of Kwazulu, Natal, Durban, South Africa.

Van der Meulen, D and Möller, F. (2017) .Railways in Renaissance — Review of Achievements and Reflection on Prospects retrieved on 3rd July 2017.

Vesely, M. (2001). "Public transport in Africa: A game of Russian roulette." African Business, 265, 12-13 (May).

Wahome, V. (2015). Impact of the Standard Gauge Railway (SGR) and LAPSSET development Corridor to the Kenyan economy, KRC, Mombasa.

Wassenbach, U and Wang, Y. (2017). African Politics meets Chinese engineers; The Chinese –built Standard Gauge Railway Project in Kenya and East Africa, China-Africa Research Institute, John Hopkins.

Zhao, A. (2016). CRBC Builds Kenya: SGR Builder Is Improving Lives And Livelihoods For Thousands of Kenyans. Retrieved from: http://www.the-star.co.ke/news/2016/03/30/crbc-builds-kenya-sgr-builder-is-improving-lives-and-livelihoods-for_c1320166

Unanswered questions on best practices in urban transport policy: how can grounded theory be of help?

Meleckidzedeck Khayesi

Introduction

The need to find solutions to existing urban transport issues such as congestion, pollution, road traffic injury, urban sprawal and adequacy of public transport services is well documented in several studies (Knoflacher, 2009; Monheim, 2003). Solutions to these issues require that the underlying landuse planning, decision-making and political causes to be addressed or understood and not merely concentrate on ameliorating traffic flow problems (Vasconcellos, 2001; Knoflacher, 2009). Solutions have been implemented in some cities, and have improved the quality of transport and urban life. For example, the experience of Latin America in implementing bus rapid transit systems is being used to advocate for the promotion of these systems in cities around the world (Menckhoff, 2005). Am I saying that these continents should not implement these systems? The answer is no. What I am driving at is that like other innovations, the adoption of public transport or any other urban transport solutions is not a simple matter of cities in other parts of the world just copying what has been done elsewhere.

Limited research has been conducted on the relative importance of different parts of the knowledge transfer process in transport, the extent to which learning about policies in other areas can influence the effectiveness of policy design in the transport arena and/or policy outcomes, and the conditions under which transfer is most effective (Marsden and Stead 2011; Marsden et al. 2011), but the few studies that exist show that replication or transfer of experience does not take place in a vacuum. There are context specific determinants that need to be understood and taken into account when adopting or adapting experiences from elsewhere (Marsden, 2011). It must also be noted that it is difficult to duplicate local experiences even within local settings. Thus, the call for transfer of successful and best practices is taking place against a background of silence on key unanswered questions: What is meant by a successful and best urban transport practice? Are the factors leading to these practices unique to specific cities or are they generic? Under what circumstances may these practices be replicated? What is being encouraged for transfer - the practices or understanding of the context under which the practices were developed? As pointed out by Marsden et al. (2011), an understanding of the issues posed in these questions would promote and accelerate the uptake of effective and well matched policies. Marsden (2011) points out the need for greater attention to be given to policy diffusion and the different stages of adoption (or rejection) of policies. He provides a good summary of the research and policy issue at hand as follows:

> "Much better use should be made of pilot studies to understand the likely adoption pathway for policies and the extent to which the policies will spread without active intervention. When intervention is needed, better communication of the benefits and the use of incentives to encourage compliance are likely to be more effective than sanctions and regulations. Sanctions and regulations can be difficult to design, expensive to enforce or oversee, and received with underlying reluctance, which can lead to compliance on paper but limited action. Good policies are only good in particular circumstances, and plans to support their rollout should recognize this fact" (Marsden, 2011).

Part of the solution to addressing the issue of transfer of practices and experience in urban transport policy lies in utilizing relevant conceptual and analytical frameworks. There is a need for an appropriate theoretical framework and/or an approach to guide research and practice in the analysis of factors that have influenced the development of best and successful practices in urban transport policy. Presently, there is no complete theory of development on successful and best urban transport practices or experiences for researchers and practitioners to utilize. This then raises two key questions: a) Can existing transport theoretical frameworks adequately handle issues concerning the

transfer of successful and best practices in urban transport policy? b) Do we continue to stick to a priori transport theoretical frameworks and approaches or do we venture out to look for approaches in other disciplines that first allow the reality to reveal itself as a basis to formulating theoretical frameworks and propositions. There is a need to explore the use of approaches that will enable urban transport researchers to develop a relevant theory and policy guidelines for transferability of knowledge and successful experiences. I tend to see grounded theory methodology providing an innovative and flexible framework that will enable urban transport researchers to study transport phenomenon within given contexts as a basis to generate propositions that can then be generalized. The purpose of this paper is to examine the possibility offered by GTM to develop a theoretical framework on best practices and innovative practices in urban transport policy. Existing theories, focusing on travel demand modelling, network structure, transport impacts, transport-development relationship, cost-benefit analysis and flow analysis, are deemed inadequate to address the issue at hand.

Thomas Kuhn (1970) observed that when existing paradigms are inadequate for the task at hand, then a stage is set for alternative paradigms to be explored. Kuhn looked at the developmental pattern of a mature science as one characterized by the successive transition from one paradigm to another. A paradigm is a collection of beliefs shared by scientists and they include a set of agreements about how problems should be shared, theoretical concepts to be utilized and methods to be employed. A paradigm shift occurs when the accepted theory and fact is qualitatively transformed and quantitatively enriched by fundamental novelties of either fact or theory. There is a need for a shift in urban transport approach if significant contribution is to be made to theory and practice in the area of development of successful and innovative practices and experiences. The usual style, commonly used in positivist scientific research, of first establishing a priori assumptions and then approaching issues with already established categories to be confirmed is inadequate to handle array of theoretical issues to be analysed and provide an understanding of circumstances under which best and innovative practices are developed in urban transport policy.

What are the core elements of GTM?

GTM, advanced by Glaser and colleagues (Glaser and Strauss, 1967; Glaser and Holton, 2004), is chosen because of the way it approaches the study of a phenomenon. This theory is not generated a priori and then subsequently tested. Rather, it is inductively derived from the study of the phenomenon it represents. The phenomenon is discovered, developed, and provisionally verified through systematic data collection and analysis. This approach situates theory building in data. One does not begin with a theory, and then prove it. Rather, one begins with an area or phenomenon of study and what is relevant is then allowed to emerge. Used well, grounded theory methodology can lead to emergence of a set of carefully developed concepts organized around a core category and integrated into propositions (Glaser and Holton, 2004).

The three basic elements of grounded theory are concepts, categories and propositions. Concepts are the basic units of analysis since it is from conceptualisation of data, not the actual data per se, that theory is developed. Particular incidents, events and happenings are analysed as potential indicators of phenomena, which are thereby given conceptual labels. Categories are higher in level and more abstract than the concepts they represent. They are generated through the process of making comparisons to highlight similarities and differences. Categories are the "cornerstones" of developing theory. They provide the means by which the theory can be integrated. Propositions or hypotheses indicate generalized relationships between a category and its concepts and between discrete categories. The generation and development of concepts, categories and propositions is an iterative process. The theory is modifiable as new data come from different sources and places. The constant comparative method weaves the new data into the emerging conceptualization. The approach uses data from all possible sources to develop the conceptu-

alization: primary, secondary and expert comments. GTM is essentially a conceptual theory generating methodology.

What does GTM offer to the study of innovative practices in urban transport?

The usual approach in transport research, as in several other academic disciplines with a positivist orientation, is first to establish a priori assumptions and then approach the lifeworld of urban transport within theoretical frameworks of already established categories to be confirmed, instead of allowing the urban transport phenomenon that we are concerned about to direct the structure of theory to be developed. Recommendations are then often made on what may be transferred from one specific setting to another, assuming that the specific knowledge of one place can be generalized to other places. This approach may not work well with respect to the concerns about best and innovative practices in urban transport policy. There is a complexity of local contextual issues that needs to be analysed and understood to be able to determine factors that influenced the development of the practices and what may be borrowed or may not borrowed, and estimate the possibility of accepting or resisting knowledge and best practice sharing and transfer. There is a need to analyse and understand the learning curves, ways of thinking and doing things in the cities that have developed best and innovative practices. There is also a need to analyse and understand likely barriers to knowledge and best practice transfer. Given that different factors and issues have influenced development of transport in different cities at different times, it is necessary to take into account context-specific determinants when adopting and/or adapting experiences from elsewhere. Transferability is not limited to technological issues but extends to details about knowledge and practice that can be transferred between cities, and what knowledge and practice is specific to a particular setting, as well as having valid criteria on what constitute best practice or successful cases. It is difficult to duplicate local experiences even within similar settings. Analysis of these issues and taking action on them requires an appropriate theory and methodological tools to guide future research and practice in sustainable urban transport policy. Unfortunately, there is presently no complete theory of development of successful practices in urban transport for researchers and practitioners to utilize. GTM is therefore relevant to the current concerns about development of best and innovative practices in urban transport because of the way it approaches the study of a phenomenon.

GTM is essentially a conceptual theory generating methodology. This theory is not generated a priori and then subsequently tested. GMT is inductively derived from the study of the phenomenon it represents. The phenomenon is discovered, developed, and provisionally verified through systematic data collection and analysis. This approach situates theory building in data. One does not begin with a theory, and then prove it. Rather, one begins with an area or phenomenon of study and what is relevant is then allowed to emerge. It leads to emergence of a set of carefully developed concepts organized around a core category and integrated into propositions. Three basic elements: concepts, categories and propositions. Generation and development of concepts, categories and propositions is an iterative process. The theory is modified as new data come in. Constant comparative method weaves the new data into the emerging conceptualization. This approach uses data from all possible sources to develop the conceptualization.

Where can GTM be applied in transport research?

This methodology can be applied to developing theory to understand both successful and failed efforts at knowledge transfer and development of sustainable practices. Policies, approaches and systems that have been developed in specific cities may be studied as a basis to develop the theory. Examples of cities that are considered successful at developing innovative urban transport systems are Munich, Berlin, Bogota, Curitiba, Zurich, Stockholm, Groningen, Copenhagen and Freiburg. Other case study cities may include those where things did not take off as was expected, for example, urban non-motorized trans-

port projects in Kenya and Tanzania. Cities presently and recently adopting bus rapid transit projects, for example, Bogotá and Dar es Salaam, can also be studied. By contextually studying these issues and cities, it may be possible to identify key variables, specify causal relations and formulate propositions for a theory on development of successful practices in urban transport as well as develop a grounded definition of: "What is a successful and best urban transport practice?" In addition, we can use grounded theory methodology to learn about the context in which cities established targets and implemented sustainable transport solutions. This contextual knowledge will generate concepts to help other cities consider their settings and how they can go about setting targets or implementing sustainable transport solutions. For example, cities can know about the context which led to Freiburg achieving a 28% car mode share from a 60% share. This way of learning will help cities work within their contexts rather than unrealistically adopting a target that was achieved elsewhere.

Application of GTM requires that detailed analysis of experiences and learning curves of specific innovative examples in urban transport should be conducted. Using information gathered, a theory can be derived and elaborated on development of successful experiences. Criteria can then be developed for assessing successful experiences and planning and methodological tools for transferability of knowledge and successful experiences can also be developed. Gathering information needs to be based on review of literature of selected case study cities as well as conducting interviews.

Conclusion

GTM provides a possible innovative and flexible framework that will enable urban transport researchers to study phenomenon within given contexts as a basis to generate propositions that can then be generalized. It is within this context that this paper has explored possible use of GTM to develop a theory on successful and best practices in urban transport. The value of GTM lies in making it possible for the experience with these practices to direct the structure of theory to be developed. It will give urban transport researchers the possibility of approaching the issue of successful and best transport practices in different spaces "theory-less" to determine if specific experiences can be organized into generic experiences in the form of propositions and a coherent body of theory. It is my hope that researchers and funding agencies will explore conducting a grounded theory methodology analysis of successful and best urban transport practices in order to develop an appropriate a theory on this issue.

Acknowledgements

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References:

Glaser, B. G., & Strauss, A. L. (1967). The Discovery of Grounded Theory. Chicago: Aldine.

Glaser, B. G., & Holton, J. (2004). Remodeling Grounded Theory. Forum: Qualitative Social Research, 5(2): Article 4.

Kuhn, T. S. (1970). The Structure of Scientific Revolutions. Chicago: The University of Chicago Press.

Knoflacher, H. (2009). From Myth to Science in Urban and Transport Planning: From uncontrolled to controlled and responsible Urban Development in Transport Planning. International Journal of Injury Control and Safety Promotion, 16(1): 3-7.

Marsden, G., Stead, D. (2011). Policy Transfer and Learning in the Field of Transport. Transport Policy, 18: 492-500.

Marsden, S; Frick, K.T., May, A.D., Deakin, E. 2011. How do Cities approach Policy Innovation and Policy Learning? A Study of 30 Policies in Northern Europe and North America. Transport Policy, 18: 501–512.

Marsden G (2011) Influences on the rollout of good policies, Transportation Research Record, pp.44-50. doi: 10.3141/2211-06

Menckhoff, G. 2005. Latin American Experience with Bus Rapid Transport. Annual Meeting, Institute of Transportation Engineers, Melbourne, Australia, August 2005.

Monheim, H. (2003). Better Mobility with fewer Cars: A New Transport Policy for Europe. Geographical Paper No. 165.

Vasconcellos, E.A. (2001). Urban Transport, Environment and Equity: The Case for
Developing Countries. London: Earthscan Publications.

The urban transport crisis in emerging economies
Edited by Dorina Pojani and Dominic Stead
Published by Springer International Publishing Switzerland 2017, published in 2017 at Euro 155.99, ISBN 978-3-319-43849-8 (https://link.springer.com/book/10.1007%2F978-3-319-43851-1)

Two phrases captured my attention when I read the title of this book in a request for a review. The first was urban transport crisis. The second was emerging economies. I was keen to learn about the content of the book on this crisis, especially its origin, magnitude, impact and solutions.

On reading the book, I realized that it is not solely concerned with urban transport crisis. Instead it offers an in-depth analysis of the historical and contemporary urban transport issues in these countries. Based on a common format to enable a comparative analysis, each chapter examines specific themes. These are trends in urban land use patterns and spatial structure, transport use and mobility, urban transport problems, urban transport governance and solutions. Each chapter makes an effort to propose solutions that can be implemented. What I find valuable in each chapter is a a rich contextual analysis in which transport is situated in the political, social, economic and environmental contexts at international, national and urban levels. The chapters also provide updated information on key issues that has been of interest in transport research, for example expansion of the bus rapid transit system in Colombia, implementation of a bus rapid transit system in Lagos in Nigeria and revival of cycling in Beijing in China. The detailed case studies or illustration of selected cities or issues add to the information value of the book. Of great relevance to researchers is an update on references, whereby the authors cite both old and recent publications on an issue.

If the book was to be revised, I would recommend that the word "crisis" be dropped from the title because the chapters go beyond an analysis of urban transport crisis. This suggestion is not meant to deny the existence of deep-seated urban transport problems in these countries but rather to be fair to the dedicated effort by the authors in unearthing not only challenges but also opportunities and promising policy actions. For example, we learn that BRT system in Colombia has spread from Bogota to seven other cities. We also learn that BRT is spreading to African and Asian countries. The issue of political management of oil subsidies in Brazil, Nigeria and Iran shows the political context of addressing sustainable transport issues in these countries. We also learn that in all the 12 countries, there have been efforts to develop and implement national and urban transport strategies with varying degrees of success. The continued efforts of moving urban transport policy solutions ahead, including the battle between the national and urban governments, are encouraging initiatives that make the book a rich resource and hence the need to replace "crisis" in the title with something along the lines of opportunities and challenges in the next edition of the book.

This book examines urban transport policy in twelve emerging economies: Brail, China, Colombia, India, Indonesia, Iran, Mexico, Nigeria, Russia, South Africa, Turkey and Vietnam. The editors must be complimented for going beyond a group of countries that is dominant in contemporary geopolitics under the acronym BRICS (Brazil, Russia, India, China and South Africa) to embrace diversity and dynamics of transport reality in countries outside the Global North of Western Europe, North America and Australia. While "emerging economies" are grouped differently by different sources as pointed out by the editors in chapter, it must be noted that these countries have been referred to using other names such as developing and underdeveloped. The editors could have provided some background to the readers by examining briefly the ever changing framing of these countries. In fact, crisis is one of the framings. Emerging is another framing. Other framings are transition and the Global South. Some of the countries defined as emerging economies are actually old civilizations, for example, China and Iran.

The editors have made an admirable effort to synthesize the content presented on the twelve countries into a comparative

overview. While this effort is commendable, what one misses to see is an effort to present any emerging set of practices or way of doing things, theories and empirical methods in transport policy and research in these countries. Are they necessarily following the path of the Global North or have they found a way of addressing their specific contextual issues like the dominance of motorcycle transport in Viet Nam and the growing middle class and its demand for private vehicles. An intriguing theme for follow up research would be the governance of urban transport in these countries. This theme is briefly highlighted in each chapter but it can be examined comprehensively in another book in the 12 and other countries.

I highly recommend this book to students, urban and regional planners, decision-makers and development partners working on urban transport and other development issues in developing countries.

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The Oxford Handbook of Project Management: Flyvbjerg, B (ed) (2017)

https://global.oup.com/academic/product/the-oxford-handbook-of-megaproject-management-9780198732242?cc=gb&lang=en&

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This is a remarkable book and of the greatest importance for everyone in involved with transport planning, traffic management, infrastructure, budgets and fiscal responsibility. It is published at a very silly price (£95.00) which will have the impact of making it totally inaccessible to many of those who really do need to read and learn from its contents. It is also available as an e-book but the e-book web site also lists the price as £95.00.

The book is a detailed, empirical, scientific examination of the actual performance of a large number of so-called "megaprojects" in 104 countries in 6 continents over 20 years. Megaprojects are clearly defined from the beginning and unsurprisingly transport is very near or even at the top of the list of examples. Megaprojects are large-scale, complex ventures typically costing $1 billion or more, taking many years to build and impacting "millions of people". Examples include high speed rail, airports, seaports, motorways, hospital, ICT systems, Olympics, new aircraft and ships and the logistic systems used to run large supply chain based companies such as Apple, Amazon, and Maersk.

A diagram on page 3 of this 624 page book shows 5 megaprojects, 2 of which are high speed rail including the controversial and deeply flawed HS2 project in the UK.

The key message in this book is that megaprojects are deeply flawed and cannot be trusted. The author has adopted the expression "The iron law of megaprojects" to draw attention to the persistence and deeply flawed nature of megaprojects:

- 70-90% have cost overruns
- Cost overruns have stayed high and constant for 90 years where we have data
- All 104 countries and 6 continents have cost overruns
- Large benefit shortfalls are common

> " (They) Combine the largest cost overrun and benefit shortfalls with the fact that business cases, cost benefit analyses and social and environmental impact assessments are typically at the core of planning and decision making for mega projects and we see that such analyses can generally not be trusted" (page 9)

It will come as a shock to the large number of rail project supporters in the UK to see some real ex-post evidence on rail projects:

Average cost overrun of 40%
Average demand shortfall of 34%
(page 9)

Flyvbjerg correctly uses another phrase to describe these projects (and one I was taught when I learnt Algol 60 and Fortran 4 in the early 1970s) and it is "GIGO" (garbage in, garbage out) (page 9).

It is very clear from Flyvbjerg's detailed, scientific, forensic analysis that there is something wrong with megaprojects. Those of us that have sat through many public inquiries into new road building in the UK are very familiar with GIGO and the large amount of assertion, assumption and misleading justification that is presented in favour of the new road. The case for the £1.1 billion M4 relief Road in South Wales is total garbage at every point of the deeply flawed argumentation and the fact that it is supported by the Welsh Government, transport consultancies and barristers is testament to the deeply unethical decision-taking process in the UK. New roads do not reduce/eliminate congestion and do not deliver undiluted local economic gains and yet these justifications are trotted out at every road inquiry.

Flyvbjerg is very clear that the powerful engine driving megaprojects absolutely

depends on under-estimating costs and over-estimating benefits. It is yet another failure of UK government decision-taking, appraisal and economic analysis that this is not revealed at public inquiries and has not yet been the subject of a major investigation into the flawed megaproject process.

Many UK transport specialists and rail fans will be very surprised about the performance of the Channel Tunnel:

- Capital costs went 80% over budget
- Financing costs went 140% over budget
- Revenues started "at a dismal 10% of those forecast, eventually growing to half of the forecast"
- The project was "financially non-viable" with an internal rate of return on the investment that is negative at -14.5% with a total loss to Britain of US$17.8 billion

Other examples of financially non-viable projects include:

- Sydney's Lane Cove Tunnel
- Arlanda Express rail service to Stockholm's main airport
- The Oslo airport rail link
- Copenhagen metro
- Denmark's Great Belt Tunnel

It is only a matter of time before we can HS2 to this list

Flyvbjerg does not just criticise these projects. He takes a great deal of trouble to identify what goes wrong and how to put these things right and that is why reading and learning from this book is essential to repairing our broken, defective and unethical infrastructure fetish. Every public inquiry, every government body, every engineer and traffic planner should have a very large print of Flyvbjerg's "iron law of megaprojects" on the wall, the desk and the opening screen on the computer:

> "Over budget, over time, under benefits, over and over again"

John Whitelegg

CALL FOR PAPERS

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Transit elements of 10-minute neighborhoods

The Healthy 10-Minute Neighborhood
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Complete streets
Vision Zero
Integrating public health and planning
How the built environment affects health
Health impact assessment
Health effects of nature
Health impact and mitigation of air pollution

Generating Neighborhood Community
Neighborhood plazas, sociable squares
Reclaiming streets for people
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Form based coding for "Eyes on the Street"
Combatting loneliness, depression

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Balanced transportation planning
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Green architecture, green urban design
Combatting food deserts, urban agriculture
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