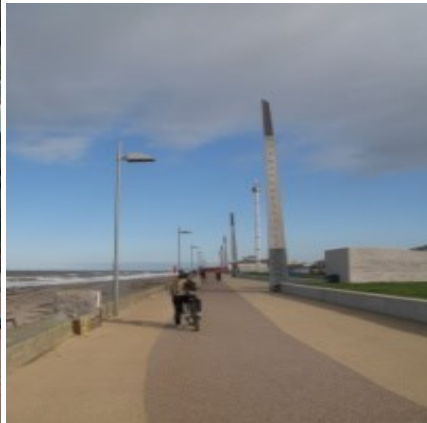


ACTIVE TRAVEL INDEPENDENT MINISTERIAL REPORT

- benefits, delivery, behaviour

To the
Minister for Economy, Science and Transport,
Mrs Edwina Hart, MBE, CStJ, AC/AM



Professor Stuart Cole CBE, BA, MSc, FCILT, FICE

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March 2015

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Objectives and Work Programme set by the Minister

Objectives

- *To establish priorities for investment by recommending the types of schemes that would bring greatest benefits with a focus on promoting access to schools, jobs and key services*
- *To test current delivery models and, drawing on examples from across the UK, make recommendations about effective delivery approaches*
- *To synthesise key messages arising from evidence about behaviours of all road users and make recommendations on how safe and considerate behaviours can be promoted*

Work programme

To establish priorities for investment by recommending the types of schemes that would bring greatest benefits with a focus on promoting access to schools, jobs and key services

- *Using the evidence base available, identify the types of schemes that likely to generate the greatest benefits*
- *Identify key barriers to schemes progressing successfully and make recommendations about how these might be addressed*
- *Make recommendations about how a prioritised programme of interventions should be developed*

To test current delivery models and drawing on examples from across the UK, make recommendations about effective delivery approaches

- *Review current delivery models for schemes in Wales identifying strengths and weaknesses*
- *Review delivery models elsewhere and assess effectiveness*
- *Make recommendations about options for the most effective delivery in Wales*
- *Identify relevant funding sources and make recommendations about how funding packages might be developed*

To synthesise key messages arising from evidence about behaviours of all road users and make recommendations on how safe and considerate behaviours can be promoted

- *Review evidence from relevant expert organisations*
- *Identify key issues to address*
- *Make recommendations on appropriate actions to promote safe and considerate behaviours by all road users*

Methodology

To recommend interventions or policies for the Welsh Government (WG) the analysis concentrated on:

- 1) An extensive search of the existing relevant literature both published and unpublished
- 2) A series of discussions on practical issues, experience and possible solutions with relevant parties and staff at local authorities in Wales, Scotland and England, Welsh Government, Scottish Government, Department for Transport (DfT), Netherlands and Copenhagen governments, TfL, Sustrans Cymru, Sustrans Scotland and other researchers in the field. National Express, ATOC, Arriva Trains Wales, First Great Western.

In this way it met the objectives set out by the Minister at the initial meeting on 18 June 2014.

Introduction

This independent report was commissioned by the Minister for Economy, Science and Transport, Mrs Edwina Hart to inform the Welsh Government (WG) on the active travel schemes likely to give the greatest benefit for those making purposeful journeys. This refers to travel between any of these origins or destinations: - home, workplace, education, leisure and health facilities.; to identify key barriers to successful progress; show which prioritisation criteria should be used in appraising schemes; to recommend the most effective delivery model and funding sources; and reviewing the means of promoting considerate behaviour in shared spaces between cyclists, pedestrians and motorised transport

The 2013 Active Travel Act (Act 2013) provides for local authorities to prepare an integrated network of cycle ways showing existing routes, existing route improvements and new routes (the last includes gaps in the existing network). The key characteristic is continuity of route.

This study follows on from the principles set down in the 2013 Active Travel (Wales) Act and the subsequent documents – Design Guidance; Action Plan; and Delivery Plan

The report also looks at the integration of walking and cycling with public transport. The research has found evidence to show that in addition to complete trips by bike or on foot, there is a large untapped market of current car commuters who given the route information and suitable waiting areas and secure cycle parking at railway and bus stations and key bus stops could be persuaded over time to change to a multi – modal not specifically referred to on the face of the Act but the strong evidence to support the proposition leads to its inclusion here.

The key recommendations set out below are fully explained and highlighted within

Key benefits (Chapter 1)

- Improvements in the health and well-being of people in Wales
- Reduction in road congestion from a modal transfer to walking and cycling
- Increase in public transport use and revenue leading to reduced subsidy or improved services
- Better access to low cost transport for those on low incomes or unemployed to get to work, health facilities and education sites
- Social inclusion benefits from low cost travel

Key barriers scheme progress (Chapter 2); Appraisal methods (Chapter 3)

- Low funding levels need to be increased to £30m per annum
- Annual 1 – year funding to be replaced by 3 – year plans
- Inclusion of active travel benefits in WelTAG / other mainstream appraisal
- More effective demand forecasting
- Simpler low cost appraisal technique for small schemes

Delivery models (Chapters 4, 5, 6, 7)

- Closer working between WG and local authorities throughout the feasibility / design and funding stages.
- Arms – length dedicated unit (covering walking, cycling and public transport interchange) for feasibility, design and funding (or an alternative in house unit with the technical experience)

Behaviour (Chapters 8, 9, 10)

- Me – centric cyclists and motorists see themselves as more important
- Behaviour reflects habit and will only change over time
- More research on impact of 20 mph urban speed limit including localised economic impact
- Education and motor vehicle driver awareness courses
- Enforcement of traffic regulations by both motorists and cyclists (and pedestrians)
- Promotional campaigns
- Clearer shared space rules.

There is a need in the post consultation preparation of the National Transport Plan to ensure that active travel modes and their integration with one another is considered with the WG move towards an integrated transport policy

Executive Summary

Part 1: Establish priorities for investment by recommending the types of schemes that would bring greatest benefits with a focus on promoting access to schools, jobs and key service

Chapter 1: Types of schemes likely to generate the greatest benefits

[REDACTED] (e.g. WelTAG, HM Treasury Transport Business Plan, local scoring systems) [REDACTED].
But [REDACTED]

- Provision of information on routes and facilities in particular network maps.
- Schemes with community involvement and which reduce community severance
- In rural areas links between small settlements and the regions urban centre
- Scoring highly on buildability, projected demand , community use and cost
- Continuation or 'filling gaps' on existing routes

- High quality surfaces and lighting; *feel secure* routes
- Segregated cycle paths and footpaths within the central business districts

Chapter 2: Key barriers to schemes progressing successfully with recommendations on addressing barriers

- [REDACTED] regarded by some as an underestimate; [REDACTED] Considerably more per head is spent in other EU states and if we aspire to the Netherlands level of active travel a catch up expenditure of £60m for several years is required.

- Land purchase – timescale, cost – may put off WG / local authorities
- The total process is held up by insufficient numbers of appraisal, design and engineering staff at some local authorities and WG
- Walking and cycling is not part of mainstream appraisal (as is the roads budget)

- Often no 'stock' of schemes with feasibility and design complete
The solutions recommended are to reverse these positions or processes.

Chapter 3: Methods to develop a prioritised programme of interventions with recommendations

- The prioritised programme has investment criteria against which is set the sequence in which schemes are constructed
- To compete effectively with investment for other transport modes in particular roads requires robust evidence on the performance and benefits of cycling and walking investment. Until the benefits are taken into account there will be underinvestment at a national and local level.
- Developing a prioritised programme means using an appraisal technique where the full range of benefits are captured and given a value (monetised, quantitative in another form, qualitative). Cycling and walking are not catered for comprehensively in WelTAG or the HM Treasury Transport Business Case. They are catered for in the scoring system in some local authorities.
- [REDACTED]
- Active travel schemes should be compared with other local transport schemes so these can demonstrate their value for money. This should use the output measures in the WG Design Guidance. The existing appraisal techniques should be modified to measure levels of walking and cycling for various categories of activities – work, education, health etc. together with the other benefits and outcomes for pedestrians, cyclists, economic impact, modal shift, risks to delivery and the delivery stages and potential delays / costs.
- [REDACTED] to bring demand and appraisal together in parallel with rail and road demand analysis

Part 2: Test current delivery models and drawing on examples from across the UK, make recommendations about effective delivery approaches

Chapter 4: Review of current delivery models for schemes in Wales identifying strengths and weaknesses

- Most delivery models require feasibility studies, design, planning consent and construction as the main stages. This is the common style of, for example, Welsh local authorities, TfL and Scottish local authorities / Scottish Government (Sustrans)
- Strengths

- The 3 – 5 year funding model, used until last year, has commonality with others in Great Britain
- Funding awards being given in stages to reflect the creation process for new schemes. This was the model for Sewta and currently for WG Capital Metro. Funding is allocated as the feasibility and design work is complete
- Weaknesses
 - The model used by local authorities is dependent on the WG grant process. This is not conducive to stability*
 - [REDACTED] and in practical terms some good schemes are not developed because of the time limitation and the risk by local authorities committing scarce resources if finally the scheme cannot be completed.
 - [REDACTED] As local authorities reported they had not been made aware of this change (June 2015) there would appear to be a need for clarity from the financial year 2016 – 17. Schemes for this financial year onwards will be under consideration currently therefore advising local authorities should be made urgently
 - Monitoring of the success or otherwise of a scheme that has no funding beyond the financial year when the scheme was completed means experiences* to advise on future schemes is therefore lost.
 - Many of the active travel schemes are low cost and therefore require a much simpler appraisal process

Chapter 5: Review delivery models elsewhere and assess effectiveness

[REDACTED]

The expenditure of £10 per head (£53m) results in a perceived impact on cycling and walking facilities with a range of high quality, more complex and appropriate schemes.

Outsourcing to Sustrans Scotland of the scheme appraisal and management of funds provides a team with experience of feasibility, design, engineering, finance and monitoring. It is also able to assist local authorities with few of these skills and to pre – consider schemes before submission. A panel assesses large schemes.

A concern (not agreed by all) that Sustrans are too close to the cycle mode. [REDACTED]

[REDACTED] The principle is not dissimilar to some units established in recent years to operate Cardiff

Airport and being considered for TrawsCymru. The key element is the specialist expertise.

TfL

This is not dissimilar to the Scottish model except that the unit is part of TfL. However TfL (London Transport as was) has many years' experience in transport planning and management and has the necessary expertise in feasibility, design, engineering, construction and monitoring to achieve the longer term benefits and learn from experience

Other European Union States

This report considered four EU member states approaches – Netherlands, Denmark and Norway and Belgium. A further study is to be undertaken between August and December to examine the journey to the present point, discuss with government and business why their policies were pursued and supported and to see how they may be applied to Wales

Big cities in countries such as the Netherlands and Denmark are far advanced compared with Wales in increasing active travel.

In the Netherlands from the 1970's there was increasing severe road congestion in cities. This did not stop the growth of car use but rather than follow the predict (traffic levels) and provide more road space a reappraisal of car policy led to developing means of encouraging the use of the railway for commuting. However this was not on the basis of high capacity car parks (e.g. Bristol Parkway) for users of fast trains. Rather the construction of local cycle points, cycle hire and the construction of cycle parks adjacent to city centre railway stations. Amsterdam Centraal has 30,000 cycle bays; Utrecht (new 12,000 bay cycle park). Copenhagen admits it is not have the high standard achieved in Amsterdam, but it is far further than we are in Wales

The concept of bike sharing (*O V Fiets* and *Bike&Go*) developed by Nederlandse Spoorwegen (NS) is now a part of the new ScotRail franchise. The new franchisee Abellio Rail is owned by NS and brought in the ideas

One conclusion drawn to encourage cycling to rail stations is to keep usage to 80% capacity for both car and cycle park and ride. This encourages cyclists and drivers to drive to a local station knowing they will have a space.

Routes to and from stations are also seen as important as the cycle parking. These routes for pedestrians and cyclists are not dissimilar to Wales' safe routes to schools but aimed at a wider age range of regular travellers. The rationale is that while stations may be secure and easy to use the approaches must be seen as secure with high quality lighting and CCTV cameras. This is particularly so at night.

A similar principle may be applied to major bus stops and bus stations. The Swansea detailed study of integration between cycling, walking and public transport (in the autumn) will identify potential sites for development. Lessons will be taken from the countries visited

When the cycle mode reached 40% of commuters in the Netherlands pressure to build parking facilities came from local residents whose streets were being used as car and later cycle parks. But land was at a premium and expensive. Public transport (buses) to railway stations were caught up in the congestion. The growth in cycle use however came not from government planning but as it became more difficult to move from home to work or railway station travellers made their own decisions based on journey time.

Constructing walking paths alongside new cycle path where all major roads in Copenhagen have parallel cycle tracks (390km) by 2016. Two '*cycle super highways*' are being built for longer distance travel

Shared space brings little conflict because of the inter modal awareness and respect – something that took a long time to achieve. Such behavioural aspects are assisted by the accessibility of cycling to all; confidence to cycle in the city centre and the simplicity of provision; the tolerance of drivers (Denmark, not the Netherlands) and the fact that there are now so many cyclists they have become part of everyday life

Measurement of the effects of cycle use is through

- Traffic accidents
- Travel time for pedestrians and cyclists
- Security of travel being separated from motorised traffic
- Children transferring from school transport to walking
- Reduction in short term absence from work
- New walkers and cyclists seeing health improvements in themselves
- More general health benefits on e.g. cancer, type 2 diabetes
- Externalities e.g. reduced CO2 emissions, noise, traffic congestion

A final ingredient was influencing planning and wider government transport policy with an integrated group overseeing bus, coach, rail, tram, cycling and walking and with representation from the business community. The possibilities for seamless travel came up in the research and the discussions to date relating to cities such as Copenhagen, Odense, Amsterdam, Utrecht, Den Haag, Rotterdam, Malmö and Antwerp

All is not rosy however and even in the Netherlands. While Amsterdam is successful many other cities have low cycle use for work journeys. Travel time for the total journey from home to work / school is the primary criterion for modal choice even in

the Netherlands. A grid structure for street makes it more difficult for cycling and walking to compete.

Chapter 6: Recommendations on options for the most effective delivery in Wales



This would be out sourced arms - length operation concentrating on active travel schemes and allocating expenditure on the basis of a minimum of £10 per head per annum (a total of £30m)

The difference would be that a new organisation would be created. It would have expertise in feasibility, design and engineering working with the WG and local authorities. This would ensure that all schemes put forward for funding would meet the criteria before significant resources had been committed to the pre - construction work by local authorities.

The balance of walking, cycling and public transport interchange schemes would be guaranteed through the WG officials' supervision of operations and the reporting process on scheme implementation and expenditure

This is the preferred option

The TfL model would be an alternative

This model has the same staff expertise characteristics as the Scottish model and might be the option in the future. However WG do not currently have the breadth of experience as yet of TfL in this area nor is there sufficient expertise in – house at present.

Chapter 7: Identify relevant funding sources with recommendations on how funding packages might be developed

Any combination of the following sources may be packaged together to provide joint funding. Principles such as match funding or by negotiation can be built in to the package.

Sources identified are:

- European Commission
- Welsh Government and the block grant
- Local authorities
- Property / land developers using Section 106 or the Community Infrastructure Fund
- National Lottery
- Private companies
- Retailers
- Employers

Part 3: Synthesise key messages arising from evidence about behaviours of all road users and make recommendations on how safe and considerate behaviours can be promoted

Chapter 8: Review evidence from relevant expert organisations

- A wide range of views have come from organisations representing cyclists, pedestrians, motorists, and operators of motor cycles, taxis, vans, buses and HGV's. The interaction of different users of shared highway space requiring different spaces and speeds and a disregard of the Highway Code quite clearly require action by the highway authorities. But the key question for them is – what motivates user response to initiatives?
 Most travellers wish to get from A to B in the shortest possible time. All want priority for example at junctions.
- This doesn't apply to all road users and many have an understanding for one another. However the belief in .
 An AA study reported 54% of drivers of the opinion that cyclists were irresponsible but as many cyclists had a similar view of drivers.
- An RAC report identified a 'moral model' where objectives and attitudes were applied to road user types' in vehicle type and driver behaviour and rights and legitimate claims to different road user in different highway circumstances.
- This dichotomy over shared space, the evidence suggests, has spread over the construction costs of specific space such as the London bike superhighways. The LTDA is considering going to judicial review.

Chapter 9: Identify key issues to address

Amsterdam (held as the cycling par excellence city), Copenhagen, or Sweden

- There are legal requirements for all road users and enforcement is frequently low on the priority list of police services. Thus there may be sporadic concentration of officers in a particular area such as in Queen Street, Cardiff and other pedestrian shopping areas; non – enforcement by officers present or enforcement at high frequency accident locations e.g. junctions
- [REDACTED]. Inexperience of car drivers and cyclists / pedestrians with the resultant inability to make allowances for one another may take time although the issue of pedestrian / vehicle conflict has been growing following large increases in car usage since the 1970's with little learnt in terms of behavioural change. A parallel may be taken with public opinion change on smoking in shared spaces which took 30 years to change from completely acceptable to being largely unacceptable to the public and accepted if reluctantly by smokers.
- [REDACTED]. The design of new roads has not taken cyclists and pedestrians into account in many cases thus failing to provide facilities or designing one which are unsuitable. The width of some cycle lanes particularly on urban highways does not approach the recommended width in the Design Guidance.
- Overall the non – existence of segregated road space and safe routes to schools, rail / bus stations and stops and high quality street lighting and signage are issues to be dealt with if the behaviour relationship is to be addressed

Chapter 10: Recommendations on appropriate actions to promote safe and considerate behaviours by all road users.

- [REDACTED] is required into the behaviour aspects now that purposeful journeys on foot or cycling has increased significantly over the last ten years (Census 2001, 2011)
- [REDACTED] (FSB, 2015) suggests that some schemes e.g. from London cycle superhighways to localised motor vehicle bans, hours restrictions and pedestrianisation may not be economically or financially viable and adjustments to their operations should be taken into account.
- [REDACTED] speed in place of 30 mph s suggested by cycling groups as making roads safer in Wales and Scotland but questioned in terms of different speeds often not well signposted. Local authorities in Wales have reviewed speeds and made a downward adjustment where appropriate. The economic effect of this was raised by retail businesses who claim that business will fail when the regulations are more strictly enforced and shoppers move to non 20 mph areas. There are also possible increases in delivery costs and taxi charges reflecting longer journey times.

- **Education of road users** comes in many forms. A training and educational programme for all users to enable them to understand one another.
- [REDACTED] could follow a more rigorous programme is suggested in particular for professional drivers of HGV's, buses and taxis in their training or revision programmes. All public authorities could insist (as does TfL) that all contractors' drivers pass a test in awareness. And bus companies could include this in courses on safety of passenger entering / leaving the bus and of pedestrians. Insurance companies and transport authorities might be persuaded to encourage a return of the police driving awareness courses (now called COAST – concentration, observation, awareness, space, time) as a criterion for reduced premiums.
- [REDACTED] such as overtaking on the left, running red lights and cycling across pedestrian crossings resulted in cyclists (14,000 in London, 2014) receiving fixed penalty notices. To highlight the danger of cyclists overtaking on the left (in itself a road traffic offence), Lothian Buses (Edinburgh) have a prominent sign 'Don't pass on the inside'. However short term schemes can have one of two effects – the infringer doesn't repeat the offence as the penalty will rise; or they wait for the enforcement officer to go and continue old practices. There was no evidence that cases had been brought against drivers 'splashing' pedestrians, the case for 'driving without due consideration for other road users' might be brought as a test case.
- *Final mile and bike hire* could be the basis of more extensive purposeful journeys by foot or bike and increasing confidence through local journeys on safe routes. For this secure storage is required at intermediate or destination points.
- *Quality of cycle and walking routes* though is an indirect action in that it can affect behaviour
- [REDACTED] have to be clearer as these are where conflicts and behaviour issues mainly arise.

MINISTERIAL REPORT - FULL VERSION

Part 1: Establish priorities for investment by recommending the types of schemes that would bring greatest benefits with a focus on promoting access to schools, jobs and key services

Chapter 1: Types of schemes likely to generate the greatest benefits – using the evidence base available

Benefits and cyclists markets

Definition of 'benefits'

It is not easy to identify which type of infrastructure scheme provides the greatest benefit as it will often depend on where the scheme is located, the target audience for the intervention and the relative impact of the scheme e.g. upgrading a crossing from pedestrians only to include cyclists along a key corridor may have more impact than a long section of new route between two small settlements. Experience indicates the greatest benefits are derived from schemes which have a clearly defined target audience and use a combination of infrastructure and promotional/behaviour change elements. (WLA, 2014)

Types of benefits

There are several different benefits which could have different policy weightings depending on the priorities of the community or government. These could be:

- Health (Davies, A, 2014; MOL 2014)
- Numbers of people cycling or walking to work
- An integrated approach to personal mobility, through modal change from motor car and its effects on:
 - Congestion from fewer motor cars
 - CO2 emissions
 - Other environmental factors
 - Car / person accident levels
 - Increased use of buses and trains leading to increased revenue; reduced public revenue support (subsidy); justification of further investment in public transport services and facilities (from bus shelters to rail / bus stations)
 - Increased public transport revenue/reduced subsidy

- Improved shopping environment leading to increased spend
- Access to facilities improved
- Convenience, accessibility, comfort for pedestrians and cyclists.

Measures of benefits

There were different methodologies for measuring success which are discussed below. In summary they are

- Benefit Cost Ratio (BCR) a form of cost benefit analysis using monetary measures or established measures where this is not possible. This would fit into WelTAG (2008) and to the HM Treasury Transport Business Case (Decision, 2012; DfT 2011)
- World Health Organisation HEAT methodology for monetising health benefits
- Number of users
- Scoring system (variations as used for Scottish Government / Sewta / SWWITCH / TfL / English Counties)

Types of Cyclist

It has also been suggested that there are four types of cyclist (Landor, 2014)

- *Sports cyclist* – this report is not concerned with them
- *Commuters* – wear high viz clothing and is likely to change clothing, shower at work and generally wear helmets, Speed: 15 – 20 mph
- *General utility riders* – wear everyday clothing, more upright and relaxed body position, bike may have a basket or pannier bags for shopping / student accessories Speed: 10 – 15 mph
- *Vulnerable / nervous/ inexperienced riders* – includes school children, older riders and parents carrying children by bike; occasional riders to work / school / retail; generally will not overtake, prefer physically segregated lanes / paths. Speed: under 10 mph.

The Act's approach is to plan integrated networks so that funding is drawn down on a prioritised basis. Priorities are determined by best practice modelling e.g. trip generation (to work, education, leisure services etc. (WG, 2014b)

Their demand patterns are different particularly in terms of safety or perceived danger of mixing with general motorised road traffic.

The last two types can be a potential source of new demand by overcoming barriers indicated below. There is also another major potential source of new demand for cycle commuting – the current car user who drives the whole journey to work or to

the local railway station and possibly the local bus stop. This is a significant market (over 80% of commuting on average in Wales is by car) some of which could be persuaded to make part or their entire journey by cycling / walking. They may already have a bike or be a potential user of the Bike2Go scheme (see Chapter 7).

Types of schemes / criteria to achieve greatest benefits

Demand based schemes

- Under the previous system used in Wales consultation could take place to assess demand. Latent demand is harder to assess than road traffic demand. In the latter traffic congestion is a good indicator of excess of demand over supply. That was the format of 'predict' (traffic flow from current capacity under supply and forecast growth using established techniques) and 'provide' (additional road space).
- The present integrated transport investment appraisal should be a 'provide and promote' approach, public transport and active travel investment-led and heavily promoted to increase demand. This uses new elements within the forecasting model and assigns more importance to active travel and public transport modes especially when compared to the current DfT traffic forecasting model (DfT, 2010; Goodwin, P 2013; Jones, P 2013; TfL 2015). However that latent demand is not easily teased out and the transfers sought are also from the motor car to active travel and not from public transport. Research using for example stated preference techniques (SQW 2007) could be used but further methodology is suggested in the Design Guidance. The analysis of potential demand is therefore required as part of developing both local strategic routes and national routes. This would be in the feasibility stage.
- Journey time (transport demand research suggests) is a primary factor in determining modal choice. Even for short journeys of under one mile the motor car would be used rather than walking. Journey time when coupled with convenience and weather may further influence modal choice. (TfL, 2009a, 2009b, 2011);
- For longer journeys particularly to/from work, the disparity in journey time may be even greater – e.g. a journey of 10 minutes by car may take 30 minutes by bike, often determined by road quality and speeds.

In rural areas, this disparity may be greater where the distance from home to work may be many more miles (10, 20, or 30) and cycling/walking may not be a consideration.

- In the view of some local authorities there is currently no provision for consultation / research or for a feasibility study. This would also include a cost analysis. The feasibility stage would explore design in more depth (keeping in mind the Design Guidance) and more accurate costing. This potential cost risk on

local authorities is seen as one reason why only a small percentage of pre – delivery money was spent. (WLA 2014 a-d; 2015).

- There are however many unknowns about the cycling market and what influences demand. TfL (2015) have suggested a Cycling Demand Forecasting Handbook along the same lines as the rail industry’s Passenger Demand Forecasting Handbook. This has determined assumptions for demand input into market appraisal. Cycling modal split assignment (route choice) and the measurement of demand causal factors (below). WG should join with TfL in developing this valuable tool for implementing the Act.

Demand characteristics to achieve greatest benefits

- Journey time comparison between modes
- Weather (SPA 2014a, b)
- Relative locations of work, school, health facilities, homes
- Accessibility of walking and cycling facilities
- Interchange at bus stops / bus stations and railway stations
- Population density (current or potential from land use changes e.g. housing estates juxtaposed to city centres)
- Deliverability (land ownership)
- Topography of, for example, valleys throughout Wales
- Suggested schemes from local community groups, local representatives (e.g. councillors) or residents if based on evidence. Community Access Plans can identify schemes at a local level and could form the basis of future funding bids under the WG Safe Routes in Communities programme.
- Promotion of sustainable means (through information / advertising) – people moving to a new home are often not aware of the opportunities for active travel
- Income / socio economic groups in the areas where schemes are prioritised. This will often affect the density, type and lifestyle of the local population
- School related schemes - bids reflect the positive approach of the head teacher (not all schools in one county put in bids) and this isn’t the best process for Safe Routes to School. The ideal is to plot routes onto road plans with school governors and highway engineers walking the route. This linked with community involvement (see above) has the best chance for a successful scheme and one which would attract funding

Care is needed in allocating funding to ensure that demand is not the only criterion. Demand levels and cost may differ considerably between a low density urban / rural area and a high population density urban area. This could be to the disadvantage of the rural area with a sparse population but where use per head might be high.

It is often suggested that a ‘shopping list’ of schemes does not represent a plan. However it can do so if the objective is clear for example to create a strategic cycling network within a local authority area and if the WG funding criteria are used to determine inclusion. It is particularly so if community connectivity with central business hub is to be maximised.

A list of active travel schemes can represent a plan if together they complete a strategic cycle network within a local authority area and take account of the funding criteria e.g. transport grant funding which promoted access to town centres from residential areas)

Integrated (cycle, walking, bus, rail) Transport Schemes – its role in establishing priorities and greater benefits

The fundamental aspect of the WG transport policy is to integrate different modes of transport with the intention of reducing car use. The encouragement of public transport, walking and cycling has therefore to be integrated with one another and with other modes. New highway plans must be tested (as required by the Act) to see if provision is made for active (but also public transport) travel through the WG grant and funding processes. This applies also to any WG funded / part-funded bus or rail stations. New railway stations such as Energlyn (Caerffili), Ebbw Town or Pye Corner have cycle storage facilities. Information on all stations cycle storage should appear on the new Wales and Borders network maps.

There are two separate cycling and walking *markets* (WLA (2014); TfL (2008; 2009a, b, 2011; 2012a; 2014 b,c,d,g), Transport Scotland (2013), PJA 2015) to which any persuasive initiatives have to be aimed:

- Those who will cycle/walk at all times in all weathers to those who cycle/walk in relatively dry weather along the full route from for example between home and work / shops / leisure facilities.
- Those who will, instead of car use, given the facility and information, cycle or walk to public transport interchange facilities at rail and bus stations or for relatively short distances and in dry weather. (SPA, 2014a, b)

Both have potential for growth and have similar market characteristics to the 'car all the way to work' modal shift to 'car to the railway station park and ride site' which has been a travel change characteristic on Valley Lines services over the last ten years for car users and walking passengers. This multi modal approach was referred to by Sustrans Cymru as 'the final mile'

The 4I's approach has been a part of the attempts to move travellers from cars to public transport. The same approach could be used to achieve a modal shift (for all or part of the journey) from cars to walk or cycle.

Information + Interchange + Investment + Imagination = Integration

The Design Guidance (WG 2014b) Chapter 7 relates to integration of modes in particular in improving facilities for walking and cycling to / from public transport

facilities (railway stations; bus stations; bus stops with several routes) and cycles on buses

However the Design Guidance (sections 5 and 7) does recommend public transport interchanges should be given a high priority when routes are developed making it easier / shorter for walkers and cyclists. Bus and train stops should be well connected to the walking / cycling networks with well signed, high quality surface routes to work and residential areas.

These have enabled penetration into the multimodal market partly through the Access to Stations programme. Evidence is becoming increasingly available on the impact of creating high quality interchange facilities such as secure cycle storage at suburban railway stations and at major bus stops serving a large population or several routes as a means of encouraging multi – modal journeys. Abellio Rail (see in their application of the Bike2Go scheme - Chapter 7; CL 2015) made this a key point in their ScotRail rail franchise application. This evidence is building up as more locations are constructed and the experience of longer term investment such as that from the Netherlands and other longer term investment locations becomes available. Many railway stations have cycle storage and this may need to be made secure or extended. Waiting facilities at railway stations are generally adequate and in some cases good. At bus stops the quality varies between good and poor, with no shelter from the elements at all at too many locations.

There was also a shift from car travel for the entire journey to rail thus also potentially contributing to the financial position of the railway service and reduced subsidy or improved revenue and service quality

In Scotland, *Transform Scotland* (TS 2014 a-d) makes the case 'for sustainable transport across all modes'. Their Interchange Audit Toolkit could usefully be applied to several existing and proposed bus stations in Wales to bring out all these benefits. Examples are

- Already constructed – Swansea, Aberystwyth, Llanelli, Carmarthen, Caerphilly, Brecon, Haverfordwest, and Rhyl.
- Under construction so could be incorporated – Newport
- Planned – Cardiff (the plans here could be tested against the Transform Scotland Audit Toolkit)

Park and ride or *walk and ride* has emerged in the view of many (WLA, Sustrans, TfL) who responded to the discussions as probably the most effective way in the short to medium term by which current travellers will be persuaded to make at least part of their trip on foot or bicycle. This was referred to by Sustrans as “the final

mile". The objective was also referred to as being to get motorists out of their cars rather than to have public transport users' transfer to walking or cycling. Clearly the former would bring advantages in terms of healthy lifestyles but could also contribute to reduced congestion in urban areas

A distinction between urban and rural also become an issue in determining the most likely successful schemes if they were judged in terms of the numbers of people using active travel journeys rather than car or public transport. If total use was a primary criterion then the urban schemes would continuously be the more successful. A means of making a distinction between urban and rural areas in prioritising schemes is needed. But conversely this should be put into the context of the lower travel distance involved in urban areas giving a greater likelihood of success if demand levels, construction costs and distances are all considered.

Bus and train companies (with local authorities) already have, or could, encourage such integration. Those most likely to change currently drive to / from work or to the local railway station by car and may be persuaded to *begin a move* to active travel through part of their journey.

Peak congestion/public transport subsidy benefits

'Encouraging cycling to school or work reduces traffic at peak times reducing pressure on other forms of road and public transport and travel times for other road users' (SQW 2007). This benefit has been achieved through improved walking and cycle paths, but has to be put into the context of numbers however with 100,000 people commuting into and out of Cardiff every day (CCC, 2015). It does reinforce the view that while some people living in the inner suburbs may be persuaded to cycle or walk to work, for most a primary objective has to be a modal change to public transport, with part of the journey at both ends by foot or bicycle, making increasing use of the Metro investment over the next 20 years (Metro 2014). But that investment in public transport must also keep in mind how people are to get to bus / tram stops and to railway stations. Varying levels investment is to be encouraged in other towns and cities in Wales but on an integrated basis.

Access to Stations Programme

This programme was aimed at reducing barriers to walking and cycling through improved access in eight English counties working on a £9m (£4.5 from DfT LSTF) project covering 20 stations over three years with multi partners of local authorities, 3 train operating companies ATOC and Network Rail. The objective was modal shift from car use to more sustainable modes integrating walking, cycling, train travel. Its benefits included reduced road congestion around railway stations, reduced carbon emissions, improved access between the stations and their hinterland housing,

employment, retail and education land uses and employment. As with all active travel it improved air quality, safety and health.

The works carried out were

- Bedford – small scale infrastructure projects including signage to both stations; promotional events, PTP surveys
- Buckinghamshire: Amersham, Beaconsfield, Haddenham + Thame parkway and Gerrards Cross – bus infrastructure; pedestrian crossings to bus stops; infrastructure measures to improve cyclist and pedestrian routes to stations; promotion, active travel maps
- Cornwall: Hayle – a new transport interchange at the station as the core of a sustainable network; two new cycle routes.
- Devon: Exeter St David's / Central, St Thomas, Pinhoe – car park converted into a pedestrian area; cycle hub with storage and maintenance of bikes; bus shelter. Exmouth – area more pedestrian and cycle friendly. Newton Abbot: new bridge link to industrial estate.
- Plymouth: Plymouth station – links into cycle routes, cycle parking, flushed routes for cyclists and zebra crossings. Saltash Road; footpath widening for shared use.
- Chesterfield: use old railway lines and bridges for cycle way from railway station to retail park near town centre and housing
- Swindon: travel maps, promotions, installing Brompton dock and cycle parking
- Warwickshire: Warwick, Warwick Parkway, Leamington Spa – EV charging points; events at stations; DDA compliant ramp; pedestrian crossing to a new bus stop; improvements of cycle routes and footpaths leading to the station; traffic route converted to cycle only

According to ATOC (2013; Haigh, C 2014) the number of cycle / rail integrated journeys has increased from 25.2m in 2008 to 39.1m in 2012. Between 2008 and 2016 the number of cycle parking spaces in Great Britain will have tripled from 23,441 to 68,996. The body responsible however has no representation from Wales and the increases have largely been in England.

The pilot of these large scale schemes was 'Bike n Ride' costing £4.5m and created in stations operated by four TOC's – Merseyrail, Virgin Trains, Northern and Southwest Trains. Improvements through this and other schemes were made at 178 stations with over 4000 new cycle parking spaces. The continuing plan is to create a number of cycle hubs with maintenance / repair, retail outlets and secure cycle parking at for example Cambridge, Chelmsford, Brighton and Sheffield. But more simple facilities will by 2016 exist at 20% of England's railway stations. At St Alban's City station there is the highest number of cycle parking spaces (1,150) where 8% of

passengers (almost the Scotland target of 10% by 2020) cycle to the station compared with the national average of 2.5%

There is in some other EU member states a large scale provision of secure cycle storage at railway stations (with some examples in the Netherlands where 2,000 – cycle garages are in use or planned in city centres, with smaller capacity versions at suburban stations). In Wales we could move this one stage further by including major bus service hubs – given that, in Wales, buses carry more people than the trains and penetrate further into residential areas.

Cycling England suggests that trains buses and trams are frequently full and uncomfortable (but this of course is mainly at morning and evening peaks in one direction). The opportunities for expanding, they suggest are limited, without major new investment in infrastructure. However we see Crossrail well on course to completion; Valley Lines and SWML electrification in advance planning stage and the new Capital Region Metro announced in February provides for a major public transport investment and capacity increase for Wales' most congested south east region (of Cardiff, Newport and the Valley and Vale of Glamorgan communities).

TfL notes that 50% of walking and cycling is from / to public transport (mainly bus, train and tube). However not all the Greater London Authority (GLA) the GLC as was is of the population density many of us see in visiting central London or the inner suburbs. Outer suburban London has characteristics of population density, travel pattern and car ownership more akin to many towns and cities in Wales

This it might be argued is only applicable in dense urban areas which in Wales might be associated with Cardiff, Newport and Swansea; though of course many of our Victorian industrial towns and rural centres (Bridgend, Llanelli, Carmarthen, Lampeter, Aberystwyth, Caernarfon, Llandudno and north Wales coastal towns have the same density albeit on a different scale and without the massive movement into central London each day. For relatively short journeys walking remain a possibility; and age (the elderly) and car ownership leads to less exercise through active travel.

Public transport is an essential part of active travel in TfL's view and it is the only transport authority to have this as part of its analysis. Incorporating travel to train or bus would be its equivalent application in urban Wales. In encouraging commuters and other activity related travel to walk to the bus or train, health improvements an important aspect and the largest part of the benefits pie which schemes are delivering.

Cycles on buses

- Journeys by both bus and bike are generally short and the four main aspects of infrastructure are – safe direct routes, secure cycle parking; public bikes to hire in city centres and integration with public transport
- Many studies have shown that reserving space on buses for particular users can be counterproductive for the travel experience of other passengers. There is little opposition to the provision of wheelchair access and space, and while means (e.g. tip up seats) can minimise the impact on the number of standees. However all additional allocated space (for luggage / cycles etc.) reduces seating capacity. This was considered in respect of such facilities (including an on board toilet) on the TrawsCymru services and these were rejected in favour of a higher seating capacity. Passenger surveys show that the next requirement after reliability, convenience, timekeeping and fare levels is seat availability. It may also lead to the need for additional vehicles and subsidy or impact on the financial viability of commercial services if this such provision is taken to extremes
- However some companies have found ways of having cycles aboard their buses – Nottingham City Transport who operate under contract, the University Hopper service have two – cycle racks at the rear of their buses. They are used by regular commuting staff and students and occasional users whose plans or the weather changes.
- Stagecoach services between Inverness and Cromarty (April – October school holidays 2013) have capacity for up to four bicycles. This is a partnership between Stagecoach plc, the Highland Council, HiTrans and Million Miles schemes... It passes through commuter villages and is a leisure facility. Spaces are booked in advance and shown in the service timetable
- A private sector company in Portsmouth – DSTL a defence R & D company on Portsdown Hill – use a private company to bus their staff from several locations into work. A private hire company – Lucketts of Fareham operate the buses under contract with 3 – bike racks on their vehicles. Employees are therefore able to cycle to / from the bus to their homes where they would cycle for the whole journey
- Other bus companies have operated special types of bus / bike services. Cardiff Bus and FirstCymru operated the Beacons Bus cycle trailer with space for twenty cycles during the summer period.

Health benefits

WHO HEAT technique

The World Health Organisation Health Economic Assessment Tool (HEAT) (2007) provides guidance on the economic appraisal of health effects related to walking and cycling and a means of calculating the cost and benefits resulting from cycling interventions. There is however more research to be done to ensure that all health effects are included in appraisal methods. Currently WeITAG does not include health benefits in a BCR calculation

The DfT report concludes that measures aimed at increased physical activity through walking and cycling are likely to be among the 'best buys' across several policy areas – public health benefits, health services cost savings and transport planning. A further benefit is the timescale for such interventions - 2 years compared with 8 – 10 years (or 25 years in the case of the M4 around Newport) for major road schemes

An interesting comparison in approach would be to apply in Swansea or Cardiff the methodology and findings in Portsmouth.

A further methodology developed for the Association of European Transport (Buchanan 2005) used stated preference and consumer surplus techniques to achieve values and thus derive BCR's (See Chapter 3)

Evidence from Transport for London (TfL)

TfL – 1

Current Welsh, Scottish and English BCR appraisal methodologies do not take anything approaching full account of the health benefits of walking and cycling. Health benefits were / are not included in CoBA, NATA and the HM Treasury Transport Business Case. In consequence a cycle junction scheme to improve safety would

- Have accident reduction values but these are a small proportion of the monetised values (ex CoBA)
- Have delays for the general motorised traffic which have a higher value for travel time than cyclists and pedestrians (ex CoBA)
- Have no monetised health benefits for either personal health or savings for the NHS. This applies in Wales also.

These values can be monetised however using the HEAT (2008) technique as can monetised benefits from reduced sickness absenteeism and the costs to the business sector. Other costs which are not monetised and therefore largely ignored at present are benefits of reduced illness, costs to the NHS improved air quality and improved well-being. If these are included in the appraisal process, in particular as monetised values, then active travel benefits become apparent. These benefits exist at present but do not show up. Thus schemes with such benefits do not appear successful. It is therefore a case of schemes which currently do have major benefits but can only show those benefits in terms of the 'most likely to generate the greatest benefits' if health factors are included in the appraisal.

TfL – 2

One of the most extensive studies of health benefits was completed in 2010 (MOL 2010, Davies, A 2015)

It concludes that the three biggest health impacts of London road travel are physical activity from walking and cycling, poor air quality and traffic collision injuries. The biggest benefits come from low to moderate levels of active travel and impact positively on heart disease followed by strokes and diabetes

Travel time in London is shown below together with the expected position in 2031 (Mayor's Transport Strategy, 2010)

Travel time spent by mode (%)		
Mode	2010	2031
Cars and taxis	38	32
Train / bus / tube	33	37
Walk	27	27
Bicycle	<2	<5

The increases in cycle, bus / train tube has been a result of transfers from the car / taxi. This is the sought objective more so than transfers to cycling and walking from public transport

The strategy has created this modal shift with a small absolute rise in cycling but a 300% rise in proportionate terms and has measured the impact in terms of years of healthy life gained each year. However the more optimistic assumptions on cycle use can also give far higher increases I health benefits.

The Strategy has used a factor of the estimated disability adjusted life years multiplied by GVA per person (from ONS) to achieve a monetised value for inclusion in any BCR calculation. The expected growth in cycling up to 2026 is estimated to deliver £250m annually in health benefits. However the best case scenario (i.e. its theoretical walking and cycling *potential*) could provide ten times this amount. This excludes any wider benefits in the economy and society.

This suggests that health benefits are a part of an integrated government policy objective and should therefore be included in the analytical process particularly when competing with roads per se and public transport for investment funding.

London Health Commission

'There is compelling evidence that there are huge benefits from taking around 10,000 steps a day: better fitness, lower cardiovascular risk and better mental health. Getting London walking requires joint action from employers, the Mayor, local councils and TfL. It requires

- Better information and labelling on infrastructure and in the streets
- Campaigns to encourage active travel

Several studies by TfL, (2014f, h) and DfT (Davis, A, 2014) have indicated that one of the largest benefits (and therefore the most successful schemes) of increased walking and cycling is a healthier lifestyle and in consequence economic benefits to society as a whole, and financial benefits to the National Health Service (NHS) through reduced costs.

TfL has the most comprehensive and in depth research programme on active travel in the UK. Its objective is increasing physical activity and 'the most significant role transport plays in the health of Londoners is enabling physical activity from walking, cycling and using public transport' Almost half of the population do not achieve the recommended minimum of 150 minutes of physical activity each week.

Evidence in the above studies shows the health benefits per person (in value terms) for those currently using cars is considerably higher when they switch to cycling (\$1300 pa) than for improvements in air pollution (\$30 pa) although road traffic accidents costs (\$9 pa) is a negative effect.

Department for Transport (DfT) - England

The English Department for Transport (DfT) have set out a clear rationale for investing in cycling and walking schemes. Like TfL it indicates the wide range of physical and mental health benefits resulting from active travel and associated cost savings to the NHS. There are also 'co-benefits' such as reduced carbon dioxide emissions, air pollution, noise and traffic congestion as a result of reduced car use and refers to evidential base indicating improved academic standards.

The literature on cost benefit analysis of interventions to promote walking and cycling has grown in recent years and reveals the economic justification for such investments has been under rated or even ignored possibly because they were not within the responsibility of the DfT or WG. Most of the schemes examined in the DfT report had an average BCR of 6.28:1 and for the UK 5.62:1. This is well above the HM Treasury minimum of 2:1 and any scheme with a BCR of over 4:1 is rated 'very high' by DfT. A range of schemes is considered

Any savings from cycling/walking health benefits in the overall context of the NHS budget are small but two factors have to be considered:

- The expected 0.75% saving in 2030 represents £1.36 bn
- The scheme expenditure levels are significantly below those of road schemes per km of construction

Transfer of health responsibilities

A report (Davis, A 2015) has suggested the transfer of health responsibilities from the NHS in England to local authorities has improved the inter relationship of transport and health schemes. It suggests that since the changes directors of public health give a higher priority to the health impacts of transport and that the biggest interest was shown in active travel followed by air quality and road safety. This is a change which WG might consider in Wales

Scottish Government view of most schemes giving highest benefit

Cycling (T Scotland, 2013, 2015)

- Secure locations for leaving bicycles lead to more cycling to work. This implies there are sufficient numbers of spaces to meet demand. The new rail franchise from 2015 (won by Abellio Rail) is required to provide 3,500 cycle parking spaces at Scottish stations
- Natural journeys to be provided for (e.g. a bridge across a stream to provide a safer shorted route to a school
- Meeting the vision target for cycling commuter journeys at 10% of the total trips in Scotland; 15% in Edinburgh and 12% in Glasgow by 2020. The current figure is 1% - 2%.
- Short journeys giving the same opportunities for rural areas into local towns as in urban areas
- Segregated routes for walkers and cyclists implies safe routes
- 20 mph speed limit similarly gives an increased perception of safety
- Other factors which the Scottish Government and local authorities wished to achieve from schemes were a reduced volume of traffic, lower speeds, more information on opportunities increasing cycling or walking to work / school / retail and leisure activities
- Changing the unpredictability of driver behaviour
- There is no distinction between short or long journeys or route sections for funding
- Making a trip that was not possible (or easy) before
- Formalises an informal path

Walking

The essential criteria (all of which must be met) for SCSP (T Scotland 2015) funding are:

- Promote an increase inactive and sustainable transport

- Aligned with national, regional and local policy in Scotland
- Targeted to specific populations
- Match funding available
- Develops partnership working
- Added value and / or new ideas or approaches
- Deliverable in the short term
- Incorporates a measurement and evaluation plan

These are the scheme characteristics which the Scottish Government believes give greatest benefit in their review and policy guidance to Sustrans who operate the appraisal and delivery process for them.

The Scottish Government National Walking Strategy *Let's Get Scotland Walking* (T Scotland 2014) is quite definite in its basis that the biggest health and economic gains come from people getting active and the easiest way for most will be increased walking. It should be a pleasant, safe and convenient and allow for everyday journeys to access work, education, health facilities.

But it also sees that there is no simple solution to changing a culture of inactivity; there has to be a partnership of a range of departments. In transport the Scottish Government, the Regional transport partnerships and local authorities (Transport, urban and land use planners) has to work with health sports, social care bodies, the private sector grant funding bodies, communities, and carbon reduction and sustainability partners. This is the context for success as the Scottish Government sees it.

The view was expressed that despite there being a National Walking Plan there was no ring-fenced infrastructure funding except where a cycling scheme was involved. This is despite the fact that 50% of the population use a pavement at some time and only 2% use bicycles. Thus potential benefits were being lost.

Two key areas where investment is required are:

- The surface quality of the route to work, shops, school etc.
- The quality of the road way especially in terms of potholes and puddles. These are of significant concern to those using the pavement and recently press comment has been made about inconsiderate drivers and some allegedly driving through roads surface puddles when pedestrians are visible. Legislation inquiries on the issue of '*driving without due care and attention for other road users*' normally refers to offences involving actual collisions but should also be considered in these 'splashing' circumstances when damage can result.

Walking – Great Britain studies

The research both previous (Buchanan 2005) and current primary research suggests that walking often receives a lower emphasis than cycling when funding is being considered and consequently health and other potential benefits are being lost.

A study (ITS, 2004) found the following factors to be of greatest importance to pedestrians and thus with the potential for greatest benefits are:

- Levels of street lighting
- Number of roads crossed along a route
- Frequency of detours along a route
- Widths of footways
- Evenness of pavements
- Speed of traffic
- Volume of traffic
- Number of cyclists encountered on shared space (and on non-shared pedestrian only space)
- Cleanliness of pavements
- Crowding of pavements
- Kerb level
- Information on the best / quickest/ shortest route; directional signage en route
- Provision of benches especially amongst the elderly or those with buggies and small children

Sated preference analysis or consumer surplus techniques used in its early stages (1982) to evaluate environmental benefits and disbenefits could be used to:

- Assess whether pedestrians value quality improvements
- Determine if stated preference techniques could be used to ascertain willingness to pay (through consumer surplus not necessarily actual payment)
- Assess the values that users attach to improvements varies between locations, different user and non-user groups

Criteria in addition to those discussed for other interventions achieving significant benefits are:

- Impact on road traffic movements (using WelTAG)
- Revenue impact on train / bus passenger numbers thus reducing subsidy cost per passenger trip key objective of WG
- Increased revenue for bus / train operators where they take the revenue risk. This will contribute to profitability or directly / indirectly to investment in better quality vehicles
- A new opportunity to test the integration of bus and bike / walker lies in the TrawsCymru network and the Bwcabus operation both of which are controlled

/ funded by the Minister for Transport (EST). A part of the operation for WG centralised TrawsCymru contracts could be to evaluate aspects of this issue

Conclusions on walking and cycling scheme types giving the greatest benefits

A key element in an integrated transport policy (the WG objective) is information.

The provision of a national map of integrated routes is currently being prepared under the terms of the Active Travel Act and forms the key pre-requisite of developing a walking and cycling policy. The Act implies that these two modes would be considered separately from other passenger modes. In preparing their local county maps, councils should take account of their integration into the wider range of facilities whether that is redesign of existing roads, design of new roads or land developments or integrating into public transport. Local authorities should not be reticent to include all the possible options for active travel. The achievement of a successful rate of growth in active travel and the greatest benefit has, in other countries, been seen to be based on a comprehensive plan push forward on a regular basis and backed by public funding. (This represents Information, Investment and Interchange in the 4I's)

Any criteria set for schemes should reflect past success in use of the infrastructure or network changes Set out here are those schemes / types of schemes the evidence suggests bring greatest benefits. These have been where:

- Information on the routes is available through the network maps in preparation. This includes the routes, their connectivity with other active travel routes, public transport, the road network and land uses and activities – work, education retail or leisure.
- An element of community involvement exists for example where a community feels cut off from the nearby town thus leading to use by that community
- Links between outlying villages and bigger settlements providing a route into schools, shops and work are involved.
- Routes alongside trunk roads reduce community severance issues (e.g. Crossgates to Llandrindod, Powys). These routes have considerable potential for modal shift
- Routes link into, or be part of, the National Cycle Network
- Routes score highly on buildability, projected demand, community use and cost
- A route which provides a continuation of existing routes or small scale projects where demand is apparent
- A hub and spoke approach was developed in town centres, at railway stations, bus stations and main multi-route / high frequency route bus stops. These link to other settlements such as housing, employment or educational locations

- Routes connect to railway stations or bus stations (or bus stops, currently infrequent) with cycle parking and comfortable waiting areas
- Construction was jointly with developers as part of a housing or business / industrial park design
- Cycle routes are continuous and where gaps have been filled
- Centres of urban areas have cycle routes to them and segregated cycle paths within the CBD are much preferred by both cyclists and pedestrians. Non segregated paths are not seen as safe by many potential cyclists and pedestrians.
- There is a significant level of peak travel time cycling and walking in urban centres. This has an absolute higher level of activity.
- The success also transfers to other modes resulting in reduced traffic levels at peak times, reduced pressure on other forms of transport and reduced travel times for other road users.
- New land developments have cycling, walking and public transport as a part of the travel network inside/to/from the development (e.g. a new £1.5m route from SA1, Swansea to the city centre and the University/Oystermouth connecting into NCN route 4, announced March 2015).

Chapter 2: Key barriers to schemes progressing successfully with recommendations on addressing barriers

As more people cycle / walk to work / education / other activities the need for investment in their transport infrastructure increases. This “predict and provide” approach worked for road building. But TfL (2015b) has shown that we know too little about forecast cycling/walking demand so a new approach is required.

If there is to be a significant change in modal split towards cycling, walking and public transport use then the investment has to come first to drive the growth in active travel. The rationale is the low level of current provision of motorised roads and a requirement to “catch up” in investment for cycling, walking and public transport use.

Underlying this position in Scotland (Sustrans 2015b) are three key features

- An increase in funding per annum from both Scottish Government and local authorities match funding. In 2004 there was no active travel budget. By 2014 this has risen to £19m from Scottish Government, £25m from local authorities and a further £9m from other sources – a total of £53m. This represents approximately £10 per head, the recommended minimum for a successful active travel impact. This still only represents 5% of the total Scottish roads budget. However the additional or improved infrastructure led to greater use of cycling to work created a critical mass of schemes and of an increase in cyclists
- A long term spending plan of three to five years to enable all types and sizes and complexity of schemes to be considered
- A clear target of 10% of commuting by bicycle or walking by 2020. While this is probably not achievable, nevertheless current investment and revenue account expenditure will move towards this objective.
- The match funding aspect from local authorities encourages both local and national planners, finance officials and ministers / councillors to maintain an interest in active travel funding

Funding levels

The present total funding level on active travel is difficult to calculate. The basis of the Scottish figures is specific expenditure on active travel by Transport Scotland (Sustrans 2015b, T Scotland, 2015) and by local authorities which in 2014 – 15 was £53m, i.e. £10 per head. In Wales the equivalent figure (including a WG grant of £12.5m) was about £15m (i.e. £5 p.h.) while the pro rata figure is £10 p.h.

In both countries figures excluded funding of schemes which contributed to walking and cycling but which came from other budgets such as re-generation in business

parks / industrial estates and as cycle ways and footpaths alongside major road schemes such as the A 477 where cycle lanes have been constructed.

This does not approach the £10 per head recommended by the Parliamentary “Get Britain Cycling” report and achieved by for example Transport Scotland and TfL (London). It is the level of expenditure also met by authorities in the western European Union states. The Welsh expenditure of £5 per head will not make a serious impact on active travel funding for those types of schemes which provide greatest benefit. This has to increase to £10 per head or £30m per annum. If we aspire to Amsterdam / The Netherlands as our target then substantially more has to be spent over the next few years to enable Wales to catch up. But of course the Netherlands began their cycling and walking programme in the 1970’s (Appendix 3). In discussion with Netherlands Government officials (Van der Vijk, 2014) the calculations we made suggested Welsh Government would have to spend £20 p.h. per year for 5 years (£60m p.a. or £300m over 5 years) to catch up with a position less than the Netherlands.

Funding sources are examined in Chapter 7

Deliverability within annual grant arrangements

The financial risk to a county council was a repeated barrier. With only one year’s Welsh Government (WG) funding authorised in any one financial year, local authorities found they had to give priority to selecting schemes which would not put them at financial risk from any shortfall in grant from Year 2. Consequently it was often the case that schemes could not be included even though on other criteria they would score well.

Major schemes such as the Vale of Clwyd Cycle Route (Denbighshire) have an estimated total cost of £8m and can only be constructed in sections. Smaller schemes might be completed within a year and more like to be put forward for grant.

Schemes can be split on the basis of

- Sections which can be split into deliverables within a year
- Likely funding for the next financial year and budget through RTP / LTF
- Land acquisition and planning achieved in previous year
- Scheme included in funding bid subject to planning consent

Total process from Local Authority to Welsh Government

The current WG staffing level covering active travel is insufficient to manage the development of such schemes particularly when compared with roads

administration. In Scotland the government's management of active travel is provided by 25 staff at Sustrans Scotland.

There also needs to be co-ordination with public transport staff at WG and with local authorities public transport departments responsible for bus stops, train franchise companies for railway station secure cycle storage and bus operators' understanding of foot passenger and cyclist interchange passengers' needs.

The total process and the budget period for active travel schemes have hindered the creation and implementation of schemes. A one year-by-year budget period has resulted in higher benefit schemes being excluded from the process. There is a tendency by local authorities either not to bid at all or to take the easy schemes. To do otherwise would, particularly in these difficult fiscal times, risk using staff or financial resources and not achieve a satisfactory output in term of schemes completed.

Land purchase

This has been known to take some considerable time. If the land is publicly owned then there should usually be no difficulty though the alternative uses for the land and opportunity cost issues could arise. Privately owned land will vary in value and if the owner requires a higher price possibly for access to a future development of their land or sees a 'ransom strip' opportunity then extended negotiations could ensue. This could put off both WG as funders and the local authority as the delivery agent taking some financial risk.

Planning procedures

The majority of cycling and walking schemes are proposed by a local authority which is usually also the planning authority. Planning consent and procedures such as public consultation will still be required. This process will take a period of time. However it is not a barrier per se. It becomes a barrier as a result of the one – year budgeting process where the feasibility and design work has to be carried out within that period and where the authority is not prepared to risk resources only to be in a position where planning consent as the final stage takes it to almost the end of the financial period and the construction work cannot therefore be carried out before the end of that period. This is a cross reference to the grant arrangements section above

No route strategy

No route strategy has been fully developed until now in Wales. The Active Travel (Wales) Act 2013 provides for integrated network maps to be produced covering existing active travel routes in every local authority Area and to create an integrated network map of new and improved active travel routes. These would be used by local authorities in preparing their transport policies. They would also be co-ordinated with those plans of adjacent local authorities. The absence of such comprehensive information has been a barrier to growth, although those maps produced by Sustrans

and some local authorities have undoubtedly contributed to the increase in cycling. The provision of storage, showers and changing facilities are of considerable importance. Signage referred to in the Act will when fully implemented change the position. However, all too often, directional signs for pedestrians, cyclists and public transport users can be insufficiently frequent, not in place at e.g. junctions, not continuous and not tested for those unfamiliar with the area. Full testing for these factors is essential to retain any potential market. The standards applied to road signs for motorised transport have to be applied to the active travel market

No public transport integration

A weakness exists in the Act which concentrates on pedestrians, cyclists and users of motorised wheelchairs, scooters or other mobility aids as isolated travel options. There is no mention of integration with public transport which organisations such as TfL, Transport Scotland, several English authorities and many other European Union transport authorities see as a key promotional factor in active travel. This can have the effect of again excluding a key active travel market sector and one which TfL calculate accounts for 45% of the total walking and cycling commuting sector and considers the 'final mile' to and from public transport as essential. The Scottish Government required the new ScotRail franchise to have a cycle park and ride expansion programme. Abellio the new ScotRail franchisee used experience from the Netherlands to present the case not just for secure cycle parking at railway stations but also for quality routes or segregated cycle ways (e.g. surface quality, lighting, meeting demand patterns) to / from the stations.

Walking and cycling not in mainstream appraisal (with roads budget)

The scoring system currently used in Wales is similar to the descriptive / scoring version used in Scotland. These methods are superior to a descriptive - only methodology as they are able at a local and national to:

- Capture the full benefits of the scheme
- To prioritise funding by WG and local authorities particularly if match funding is required.

However walking and cycling has to be brought into the mainstream appraisal process with all other transport schemes if it is to achieve a level of funding which the evidence overseas and from England (SQW 2007; Appendix 3) suggests.

Using monetised benefit cost ratios (BCR) to compare road schemes concentrates on journey time savings and reverts to the appraisal processes such as CoBA where road user benefits were uppermost. Economic appraisal in transport generally has come a long way since then (see WeITAG below; also Chapter 3) but a further step is now required.

The biggest benefits from walking and cycling are those associated with personal health and the costs of an unhealthy population TfL (2014f), Davies, A (2014), but also included are air quality (CO2 emissions) and other environmental benefits and vehicle economic resource costs coming from road congestion especially during peak periods

On such a basis the evidence shows that walking and cycling could achieve high BCR's and should then lead to strong Government support through increasing health and fitness, reducing traffic congestion and reducing pollution.

The importance of BCR's in enabling walking and cycling to compete for funding with road and rail infrastructure schemes becomes even more critical when the WG becomes responsible for railway infrastructure investment. Local authorities also have scarce capital and revenue account resources. If the minimum suggested figure for active travel capital investment and revenue account expenditure on maintenance or promotion / information is to achieve the comparable level with other parts of Europe (at £10 per head equivalent to £30m per annum in Wales) then a robust prioritisation appraisal process is required

WeITAG Appraisal

This Welsh Government appraisal scheme methodology will continue to be a barrier until the inclusion of walking and cycling primary benefits are brought fully into WeITAG (2008) and its contribution to local economies, health, well - being and traffic congestion is fully realised in the appraisal.

WeITAG is the appraisal technique used by the WG to determine the rate of return of a particular transport scheme. It is currently being reviewed (a process which so far has extended over six years with no major change). It is related to the DfT's WebTAG appraisal procedure a review of which is due out in March 2015.

It has a current methodology which is not conducive to walking and cycling schemes because of the elements it omits (e.g. health benefits).

Appraisal techniques have changed over the last fifty years to include additional criteria

- 1960 – Road construction benefits included travel time savings, vehicle operating resource costs and accident costs – CoBA / consumer surplus and generalised cost concepts.
- 1980 - 1990's – moves to include environmental factors both adverse and beneficial
- 1980 - 1990's – moves to include public transport investment in an integrated transport approach SRA Appraisal; EC Sonerail
- 2000's – development of NATA and the HM Treasury Transport Business Case (5 – case model) where the strategic questions could be applied to all modes
- 2010's – moves towards specifically including walking and cycling into the appraisal process

This process away from merely traffic benefits to existing motor vehicle users (but in the main car users) has been gradual and slow.

Monetary values for cycling and walking impacts.

Active travel projects have to compete with one another for priority within that sector funding. However they also have to compete for transport funds with schemes whose economic appraisal results in a numerical benefit cost ratio (BCR). Road and more recently rail schemes (including the Valley Lines and SWML electrification schemes) have moved to BCR based comparisons for priority setting.

Several studies have produced BCR results for several interventions and which are discussed in Appendix 3.

The WG Design Guidance sets out the rationale for such appraisal processes.

No 'stock' of schemes with feasibility and design

The pre 2013 process for developing schemes by local authorities included sufficient time and initial funding (from WG) to cover preliminary design, scheme specification, resolution of land ownership / purchase and planning issues. That period is now included in the annual grant allocation period. In addition a local authority may risk resources on non – fulfilled projects. Thus a pool of potential schemes which would eventually make up a network is being lost. However this pool might be continued if a degree of certainty was attached to WG funding but paralleled by match funding from the local authorities themselves (including internal resource costs).

Chapter 3: Recommendations on how a prioritised programme of interventions should be developed

Alternative appraisal techniques / changes to existing appraisal methodology

A suggested barrier to success is the current methodology for transport scheme appraisal set out in a series of reports (Chapter 2). The case is for government cycling investment to compete effectively with that in other transport modes requires robust evidence on the performance and benefits of cycling investment (TfL; DfT op cit; Cycling England; also Appendix 4). Until the benefits are properly taken into account there will be a systematic under investment at both national (England) and local level. This same point was put forward by some local authorities in Wales

Cycling infrastructure can pay for itself if designed and planned with a cost benefit modelling base. This will ensure a better return on investment in cycling (and walking would be sought in Wales. Cycling should be an automatic consideration as part of the planning process and the primary benefits claimed in the report of cycling implies walking and public transport) are:

- Valuing the benefits of attracting additional cyclists (and walkers)
- Rising the profile of cycling (and walking) in the planning process
- Calculating the number of additional cyclists required to generate a return on investment (less than might be thought is the conclusion)
- A clearer sense of return on investment that a cycling or walking project will deliver
- Planners would adopt the same rigour as is applied when considering other transport (e.g. road / public transport schemes)

There is a sense of déjà vu here. Looking back to the 1980's when public transport capital schemes were at a disadvantage of not having cost benefit analysis (the CoBA technique) applied to them and became less likely to be built than road schemes. The application to public transport followed a paper (Tyson, WJ & Cole, S (1977), *A cost benefit approach to public transport investment*, Transport (CIT journal) May 1977) setting out the principles including bus revenue and environmental issues as well as traditional CoBA elements for road users investment.

This report concurs with the Design Guidance in its rationale for evaluation:

- Compare and prioritise scheme design options
- Compare active travel schemes with other local transport schemes (but keep in mind that attracting people away from car travel is the objective. Much less so that from public transport
- Demonstrate that schemes represent value for money

- Monitor the initial evaluation benefits against any potential disadvantages for other road users (see reference to modal shift from public transport)

Appraisal techniques used should be clear from the outset of the planning of any scheme. The output measures in the Design Guidance in relation to any route or other investment are:

- Measures of levels of walking and cycling
 - For the whole journey
 - For part of the journey to public transport (rail / bus/ tram)
- Measure changes in
 - Levels of walking and cycling in general for work, education, health
 - Levels among user groups
 - Trip category
 - Safety perceptions and reality
 - Facets of a route
 - Revenue generation aspects of a route (e.g. in public transport usage and revenue income)
 - Health benefits
 - Economic benefits

Developing a prioritised programme of interventions in active travel (walking and cycling and journeys to catch buses and trains also an essential part of active travel) has two levels of an appraisal process. This implies that an appraisal methodology is required to determine priorities but this has to be a given. The process has to be robust and consistent. However as many of the schemes involved are relatively small, a full appraisal process such as WelTAG has only limited use in determining priorities and value for money. Similarly the HM Treasury Transport Business Case can be used to determine to ensure that strategic objectives are achieved. However a 'lite' version of either can usefully be used with variations. Transport Scotland has created such a version and it may be commended as fulfilling much of the narrative on schemes as well as providing sufficient numerical data(e.g. costs and benefits in usage terms).

The two levels of appraisal are:

- Comparing active travel schemes put forward by local authorities, one with another, within a given total budget for those schemes (funded by national / local government and other sources in public, voluntary and private sectors)
- Bidding for the total funds within the transport capital budget for initial construction of the scheme. This could be from low cost signs, hard or electronic information to paths, bridges, separation from moving motor traffic; The future allocation of funding from the revenue budget for continuous maintenance of the structures.

The scoring systems outlined below and in Appendix 4/5 can be used to allocate funding within a budget set aside for active travel schemes. Each scheme is examined on an objective basis by both local authorities and, for those put forward for funding, by the central team.

The assessment at the Welsh Government stage could be by its own officers or as will be recommended a format similar (but not identical) to that created by Transport Scotland for the team to appraise / assess lower cost schemes and those over a cost threshold to be determined by the Minister are referred to an independent panel.

Stage-gate Evaluation Model for RTP funding

- WelTAG 'lite'. This would usually be for a group of schemes; scored against LA priorities and objectives; possibly for schemes of £20k or above
- Schemes are scored – this is a complex process but is the only low-cost method to prioritise
- Five – year programme with less detail on later schemes
- Political pressure / local activists / ambitions
- Apply for funding for feasibility (business case) study
- Approval from CC Executive
- Approval from County Council Executive to apply for WG funding
- Next stage detailed design

In this evaluation model small packages can be dealt with together to achieve the primary aims relating to employment, health and education objectives

Scoring System: derived from Sewta Active Travel Prioritisation / Bridgend CBC - Wales local authorities – typical version

This is a variation on WelTAG Lite in practical use

This scoring system includes elements shown in Appendix 1

Scotland – scoring system and STAG

Scores are set for each element and a total produced for each proposed intervention. This then enables a comparative analysis (with any appropriate weighting for different elements) to be carried out as a basis for setting a priority list

A problem has arisen with the Scottish appraisal equivalent of WelTAG. Called the Scottish Transport Appraisal Guidance STAG it consistently produces BCR's for active travel schemes lower than those in WebTAG. Sustrans has therefore been using the English WebTAG process which does produce higher BCR's. (Sustrans, 2014b)

An applied description of the elements and scoring matrix are in Appendix 5 (Scotland) and Appendix 10, Waterloo Road Case Study. This was developed and is operated by Sustrans on behalf of the Scottish Government

London (TfL)

TfL made clear their view of the incorporation of travel to and from public transport as a very effective way of generating more physical activity in for example the journey to work, to education and health facilities and journeys for leisure (as differentiated from leisure journeys). The appraisal methodology for prioritising active travel schemes in Wales concentrates on walking and cycling with limited reference to public transport.

The scoring system used by local authorities in Wales (WLA) is not fundamentally different from those used in Scotland, London (TfL) and England. The elements and individual element weighting may differ in detail. However when compared with the TfL Strategic Assessment Framework (SAF) the WLA is appropriate in having a single input sheet and enables each investment option to be matched against different sets of criteria. As in Wales the TfL SAF does not have forecasting (TfL 2015b) or analysis capabilities. Also as in Wales the SAF is a template that can be used in order to store key arguments about our projects and programmes in a consistent way and report their appraisal in an agreed format.

As in Wales, Scotland, TfL and other English counties use a scoring system which varies between -3 and +3 as follows:

-3	strong negative impact (red)
-2	moderate negative impact
-1	slight negative impact
0	neutral impact (orange)
+1	slight positive impact
+2	moderate positive impact
+3	strong positive impact (dark green)

Scoring is not entirely mechanistic; as in the Welsh models there is inevitably some subjectivity particularly where there is no quantified data available. However the scores have to be accompanied by evidence – based rationale and a rigorous test of the inputs.

An SAF report on each scheme requires three types of thematic reports

- Graphical summary reports for a single option based on the scores. TfL will not accept scores only; it requires text containing evidence for the scores so cannot be used alone for decision making
- Text report which presents for each scheme an analysis (usually narrative but with quantification where available) The four head criteria together with sub criteria are:
 - Economic Progress – impact on operating costs, access to jobs, employment and earnings, highway reliability. Public transport network capacity, business growth, journey time,

- Climate Change – impact on air quality, CO2 emissions, resource efficiency, network resilience
- Safety and security – impact on network resilience, safety for public transport users.
- Improving life quality – impact on air quality, active travel (cycling), active travel (walking), customer satisfaction on public transport users, customer satisfaction for road users

These are then subdivided into sustainability improvements e.g. productivity and competitiveness, employment and earnings, congestion and smoothing traffic flow; CO2 emissions, adapting to climate change and resource efficiency; security and resilience of the transport network, transport (including road) safety; enhancing well-being.

The analysis is then completed with an evidential commentary and a final score / rating

- Comparison reports (The Comparator) look at multiple options to compare them against one another. This tool can read the output from up to 12 SAF assessments and display the results in pie chart form using the same scoring values for each segment as above.

The early stage assessment described here parallels the HM Treasury Transport Business Case model In summary the SAF has three stages in achieving the Treasury appraisal ‘Strategic Case’

Early assessment

- Assess all options as a basis for short listing
- Further develop the options iteratively based on weaknesses identified
- Ensure objectives are realistic and meet some / all of the options
- Produce comparison figures (if available) for inclusion in the Business Case

Business Case development

- Further refine the preferred option once selected
- Ensure the evidence on strategic fit remains relevant by updating the assessment including any subsequent results from analysis and modelling
- Update the Strategic Case part of the Business Case

The final stage relates to delivery and post project completion monitoring. Here the objective is to ensure that the benefits originally identified have occurred or are expected; it also has to ensure that actions which the SAF defined are achieved.

WeITAG ‘Lite’

This uses WeITAG Stage 1 evaluation. It parallels the identification of those schemes most likely to achieve the greatest success – as set out below.

For example, Bridgend transportation schemes included in the Regional Transport Plan (RTP) were assessed using a Stage 1 WeITAG appraisal. Some of these schemes are contained within the Local Transport Plan (LTP) proposals however the

local authority undertook an internal prioritisation exercise. The prioritisation tool was based on a matrix used in developing the Cardiff Strategic Cycle Network Plan and used by Sewta's Active Travel group to create the RTP active travel scheme prioritisation process (see above and Appendix 1). Some additional form of economic appraisal might be included but the analysis cost should be commensurate with and reasonable for the scheme cost

HM Treasury Five Case Model (simplified version using limited questions from three cases only)

This also parallels the experience found by local authorities in identifying the most successful schemes in terms of the WG criteria. The elements involved are those set out in the Strategic Outline Case:

- Strategic case
- Economic case
- Financial case

The appropriate questions from each of these cases as set out in the Transport Business Case (April 2011) could be considered as a basis for inclusion of a scheme in the list for prioritising.

DfT London, England

- A series of schemes including those operated by Sustrans, located in Sustainable Travel Towns, research for Cycling England and a number of local authority schemes have given an average BCR return on investment of 5.62:1. The average BCR for Local Sustainable Transport Fund (LSTF) projects was 5:1 which indicates very high value for money. These are far in excess of HM Treasury minimum BCR requirement of 2:1 to even consider schemes. Some of these schemes and others overseas showing successful application of funding are shown later in this Appendix
- The total investment of £600m in 2011 – 12 to LSTF projects was followed by eighty cities being awarded £77m and four national parks in England, £17m in 2013
- DfT have proposed an appraisal process (described below with a critique of assumptions) and it is in the context of this process the best returns are suggested (DfT, 2014)
- Professor Phil Goodwin (Goodwin 2011) has reviewed the changes on BCR's of various transport schemes to conclude on the best value for money. This fits into a basic premise of this report that active travel should not be seen in isolation but as part of an integrated transport plan. Goodwin suggests the best returns come from smarter choices, local safety schemes, cycling schemes, the best of local bus and some rail service reliability enhancements and light rail schemes. This is in contrast to the Eddington Report (Eddington

2006); which suggested the best rates of return came from large scale transport schemes such a major new motorways which give a lower estimated value for money / rate of return because traffic growth has been lower than expected traffic growth, how taxation is dealt with in resource costs, road pricing or changing trends (Cole, 2013)

Recommendations

- Continue to use the existing scoring system but with a move to standardisation of the variations used by different local authorities
- Examine in detail the Scottish methodology currently being completed by Sustrans Scotland (see case Study: Waterloo Road in Appendix 10)
- Move towards including walking and cycling in a monetised BCR approach for inclusion in WeITAG
- Work with TfL (2015b) in developing the Cycling Demand Forecasting Handbook to fill the data gap which puts cycling infrastructure provision at a disadvantage to road schemes

Part 2: Test current delivery models, and drawing on examples from across the UK, make recommendations about effective delivery approaches

Chapter 4: Review current delivery models for schemes in Wales identifying strengths and weaknesses

Options identified in Chapters 4 and 5

Within the UK four models have been examined in detail:

- Wales – past. Here local authorities had funding for feasibility studies including demand analysis of options. These schemes were then put forward for consideration by a small team within Welsh Government
- Wales – current. As in the ‘past’ model but with no funding for feasibility studies. Consequently not having their own funding for this work, the number of bids have fallen
- Transport for London (TfL)
- Scotland. National process managed by an outside authority (Sustrans carries this out on behalf of Scottish Government) with schemes created, evaluated and prioritised by local authority

The Netherlands model was assessed as an EU comparison

Wales' delivery model

The delivery model used in Wales is derived from the Welsh Government (WG) so far as schemes funded or jointly funded by WG are concerned. This also applies to the appraisal process based on a scoring system (Appendix 4/5/11).

Strengths

- The previous grant funding programme appraisal contains elements of an effective delivery model not dissimilar to those elsewhere in the UK.
- This can be seen in the current WG Metro programme model which follows a similar process to that developed and used by Sewta, with funding awards being given in stages. Using a two-year delivery timescale and a two-stage funding approvals process, the first phase of funding is approved in order to undertake and complete design work. Additional funding is then allocated once designs have been completed, approved and a pre-tender estimate is obtained. This gives greater assurance to the funding provider that the scheme is managed effectively and minimising risks.

Weaknesses

- The delivery model used by local authorities surveyed will generally depend on the grant conditions associated with the WG grant programmes.
- Currently however WG grant programme bids are invited annually with funding being allocated for single financial years to design and deliver schemes. Delivering these schemes, particularly where any legal orders or land issues need to be resolved, within a single year is 'challenging' especially when funding is awarded either at the end of March, or early April. In practical terms this means many schemes would not even be considered despite the fact their merits might be considerable. A local authority will not risk resources (in house staff or outside costs) to examine schemes which are unlikely to be completed within the 12 month period. If the design work and planning /land purchase is completed there is still no guarantee or indication from WG that the scheme will be successful in the following year
- Although existing funding programmes allow local authorities to include monitoring within the cost of the schemes, this generally only covers the cost of capital infrastructure (e.g. automatic cycle counters) and revenue works (collecting and analysis of data) during the life of the scheme. This is generally a single financial year and means that there is no funding available to undertake monitoring beyond the year of delivery.
- The appraisal process in Wales covers large schemes (a threshold of £1m is suggested by some but is not prescriptive) and also many small schemes. The level of work therefore required to carry out these latter appraisals has to be low and should retain the current scoring / narrative/ rationale basis. There should therefore be two levels of detail and two processes for the different sizes of schemes.

During the preparation of the report discussions took place with officials regarding the existing 1 – year process period for active travel schemes compared with a 3 – year process period. I was informed that WG 'had moved (or is to move soon) to a delivery model reflecting the need for indicative funding for up to three years' as recommended in this report.

Chapter 5: Review delivery models elsewhere and assess effectiveness

Scotland

The early schemes implemented in Scotland were those which were the easiest – e.g. disused railway lines which could be created in six weeks. However well organised campaign groups pressed for infrastructure for walking and cycling which reflected demand. There was popular support for this form of expenditure thus a new team within Transport Scotland was set up to manage the increase in funding. Also a target of 10% of work trips in Scotland (15% in Edinburgh) would be cycling or walking by 2020 is set out in the Government's Cycling Action Plan for Scotland. At present the level is 2% so increased funding for two primary areas – NCN and Community Links was forced on the government.

A budget is set by the Scottish Government for the financial year. The current funding levels are:

Source	£m
Scottish Government*	19
Local Authority (match funding)*	23
Other sources	8
Cycling Scotland	2
Trunks roads budget	1
Total	53

* Specific walking and cycling (active travel) budget

Process

The process of appraisal of schemes and management of funds is carried out by Sustrans Scotland on behalf of Transport Scotland. All schemes are submitted to Sustrans by local authorities; schemes are assessed using a scoring system; funds are distributed to the partner organisations who deliver a range of interventions. These help to increase the numbers of people making short trips by walking and cycling.

All schemes over £500k are passed to a panel for final decision. The panel consists of a representative from:

- Sustrans Scotland
- Cycling Scotland
- Living Streets
- Paths for all (Scottish Land reform Act access to routes)
- Society of Chief Officers of Transport services (local authorities)

- ICE
- Transport Scotland (observers)

There is an appeals procedure if a local authority disagrees with any decision

The process makes possible competition between local authorities with a published league table which showed that some local authorities put in considerable match funding (Edinburgh 7%) and some did not (Glasgow – small %)

A decision by Transport Scotland was between either:

- Every local authority receiving pro rata ring-fenced funding based on e.g. population or
- A more sophisticated scoring analytical system.

Scheme quality is a key criterion and the help provided by Sustrans appears to be welcomed by local authorities so Sustrans shape schemes as well as operate grant provision. This began in 2007 – 08.

The funding is in two parts:

- Year 1: funding feasibility and design of projects; land purchase; planning permission; there is no construction
- Years 2 + 3: it is implicit in the process that a scheme which has passed the year 1 process will be funded. For 2015 – 16 local authorities are submitting projects; Sustrans has £10m from Transport Scotland and local authorities have put in their match funding in the belief that they will get the funding in total. Thus local authorities have funded feasibility and design studies.

The Sustrans Scotland: walking and cycling outcomes report says it and other agencies demonstrate how travel patterns in Scotland can change through interventions such as those set out for Edinburgh (see below). These will change the built environment and public realm by making it more attractive to walking and cycling. It seeks to present the options available ‘ to enable them to travel actively’ However there is also no mention of public transport integration in the Sustrans annual report but Transport Scotland and Edinburgh City Council planners were both keen to include this , as they see it , important market segment.

CASE STUDY: EDINBURGH CITY COUNCIL (ECC 2014a, b; Herriman, A 2015)

The city council want to realise the benefits that more active travel can bring in the form of better health, road safety, environment, benefits to business and wider economic benefits. Their evidence supports that of Living Streets (LS, 2013; see Appendix 6) which shows that walking encourages people to linger and spend more with DfT research showing a BCR of 3:. The council favour joint actions with other bodies to assist with / encourage:

- *Design guidance and training street designers involved buses, trams, walking and cycling*
- *Safer routes to schools and school travel plans*
- *20 mph zones and speed limits*
- *Tackling missing and sub-standard walking and cycling links*
- *Marketing and promotion*

- *The Walking Action Plan*
 - *Infrastructure – priority corridors and actions*
 - *Infrastructure – integration with public transport (e.g. priority list of bus stops for major upgrading)*
 - *Infrastructure – crossings and junctions*
 - *Infrastructure – removing footway obstruction (including de-cluttering, improved surface and lighting)*
 - *Signing and promotion*
- *The Cycling Action Plan*
 - *Improve conditions on the existing cycling network – on and off road*
 - *Extend the coverage of the city cycle network*
 - *Improve cycle access, safety and priority*
 - *Increased cycle parking provision*
 - *Support innovative cycling schemes*
 - *Promote status of cycling increase mutual awareness and respect between cyclists, pedestrians and other road users*
 - *Improve coordination and partnership within Edinburgh CC and external organisations*

The city council believe that this process and plans will make inroads into short journeys market (29% of all journeys are 2 – 5 kms long) through walking and cycling

Assessment of effectiveness

The process used in Scotland is an attractive option. Up to this year there has been a three – year budget unlike the one – year fiscal process we currently have in Wales. This has enabled the delivery model to be very effective in progressing a range of schemes not just the ‘easy’ ones. Consequently the range of quality, more complex and greater appropriateness of schemes has been achieved.

The funding level at £10 per head of population is also appropriate, however the pace of construction of walking and particularly cycling schemes in Scotland has been faster than in Wales which suggests a funding deficit in Wales now requires building up to a higher level per head.

The outsourcing (to Sustrans Scotland) of the scheme appraisal and management of funds had several advantages:

- It is operated by a team with experience of scheme appraisal and feasibility; design, engineering and able to assist local authorities put a proposal together. This is particularly useful for a local authority which may not have the required skills. This has a further advantage of more stability in the team (as opposed to one of in – house staff who often move frequently between functions and may not have 100% of their time dedicated to the active travel function)

- The schemes can also be pre – considered before submission to ensure they meet the criteria for funding.
- Transport Scotland officials supervise the process
- A panel assesses large schemes
- There is an appeals procedure if a local authority disagrees with the decision

A disadvantage of the Scottish model is a concern (not agreed to by all) that Sustrans Scotland per se are too close to the cycling mode and possibly the cycling lobby to provide totally independent judgement if funding is to be split between cycling, walking and access to public transport as a multi – modal journey. Evidence in this report suggests that the most effective means of increasing walking and cycling for example for commuters, would be to encourage those activities between home and the railway station or bus stop.

The model for an authority the size of WG would look seriously at this out sourced delivery model but with an organisation containing cycling, walking and public transport elements.

The joint – funding principle is based on match funding with about half of the money from the Scottish Government and half from the local authority is also a satisfactory approach as it emphasises commitment at both local and national level.

As an overall model it has grown in influence and spending has reached the £10 per head target with scheme delivery at a high level

London TfL and London Boroughs

The pattern of investment is politically driven by the Mayor. Two Mayors in succession, Mr Ken Livingstone (Labour) and Mr Boris Johnston (Conservative), have set similar transport strategies with an emphasis on public transport and active travel and the integration of the two. But even in London the appraisal process has not yet come to the point that TfL would wish to be. The Mayor's Transport Strategy (MTS) (2010) has set a target of a 400% increase in cycle trips on 2001 figures and a 5% modal share

Although TfL is responsible for 5% of road length in London this carries over one-third of the traffic; the remainder is a small part with the Highways Agency and the other 60% managed by the London boroughs. All traffic lights (which can be used to clear congestion), all the bus network and bus stops and day to day road management is the responsibility of TFL

Each of the thirty three London boroughs has to produce a London Implementation Plan (LIP) for transport. This must be approved by the Mayor who may issue statutory guidance which boroughs must follow and has reserve powers on specific directions and may be rejected unless the LIP is:

- Consistent with the Mayor's Transport Study

- The proposal are adequate to implement the MTS in its area
- The implementation and completion timetable is adequate to achieve the MTS in that borough.

The budget for this year was £150m weighted by need with outer boroughs with low traffic flows having a lower allocation of funds compared with Kensington and Chelsea or Camden. Boroughs can apply for additional grant if the targets cannot be achieved.

The infrastructure for cycling and walking can be negotiated at new car parking provision for retail, housing or office development

In 2013 the Mayor's Cycling and Walking strategy was underpinned by £1 bn to cover:

- Bike infrastructure on the Tube network; bike superhighways and junction improvements (where injury and deaths were the primary criterion)
- Quiet routes
- Safer streets for cycling
 - Training (delivered by London boroughs)
 - Working with freight industry (work related road risk especially HGV operators signing up to a code of conduct)
 - All TfL contractors have to agree HGV / other vehicle drivers training including high awareness of cyclists
 - Road safety police (with the metropolitan Police Service – also the Mayor's responsibility) with patrols to issue penalties / warnings to drivers and cyclists for infringements of stop lines, traffic lights, overtaking on the left (by cyclists). Comparable examples exist in the other two capital cities. The issue of shared space between cyclists and pedestrians can lead to accidents with cyclists not appreciating that a pedestrianised area cannot be ridden through at more than 5 mph; and in many cases not ridden at all because the space is not shared. E.g. Queen Street Cardiff (see Chapter 9 on behaviour)
- Infrastructure for cycle parking with funding to businesses to have a cycling policy (and facilities) at e.g. retail stores for customers and employees alike. This may lead to similar facilities as in Utrecht where local retailers in many cases have Sheffield stands outside their shops for their customers use

On street cycle parking is the responsibility of London boroughs but parking standards have been set for different land uses. There are distinctions in some cases between long stay and short stay cycle parking. For example a food retail operation requires 1 space per 175 sq. m; non-food retailer 1 space per 250sq.m; student accommodation long term 1 space per 2 beds, short term 1 space per 40 beds

The Santander Bike Hire scheme in London (funded by the bank and managed by TfL) has 8000 cycles with secure storage for all and payment facilities on street

For the London Boroughs (the equivalent to counties and county boroughs / cities in Wales) there is a seed funding pot where money is secure for future use but schemes require feasibility and design work, consultation etc. The project (including tenders) was managed by Sustrans; design work by Sustrans who then processed design and delivery. Therefore in year 1 design and feasibility was carried out and if this met the specification then funding is guaranteed in years 2 and 3. This provides a pool of projects which if allocated on an annual basis might not get all the best schemes. The Cycle Commissioner makes the final decision. Under the previous delivery system each borough made its own decisions and standards were not consistent and often not satisfactory. The London Cycle Design Standards (similar to the Wales Design Guidance) is the basis of the Cycle Commissioner's decision

Another element is the Project Delivery programme which operates the congestion charge and the bike hire scheme

Delivery in London has many facets both positive and negative

- TfL's annual government grant is 1.5 bn (for capital and operational schemes) with other income from the farebox, borrowing through investment bonds and business rate income
- Big retail / housing / office / industrial developments under section 106 can be asked to part fund a scheme. But 'pooling' between developments is no longer possible but it might be possible for an out of town housing development to be asked for funds to cover cycle docking stations in the central business district
- The balance between 'local' and 'global' impacts may show up in a business case with a BCR of under 1:1 because some cycling or pedestrian scheme (e.g. a road width restriction may cause traffic congestion over a wider area but brings benefits at a particular road junction) A similar point may be made about 20 mph speed limits in urban areas or small settlements on a busy road. There may be a reduction in walker and cyclist accidents but in the BCR the slowing down of traffic may have a detrimental effect on local businesses. The portfolio benefits may be positive overall. This also illustrates the need to incorporate health and other non-monetised benefits in the appraisal
- Junctions are one of the main areas of cyclist accidents in collision with motor vehicles. Traffic lights sequences may give a slight delay for cars but there can be benefits for the cyclist moving ahead and the car turning left

Negative BCR

This is shown in the case of the cycle superhighways in London where the Mayor has said that this investment would attract thousands of new cyclists onto London's streets. The RAC Foundation has however pointed out that the BCR is negative – the cost of £38m generating disbenefits of £200m caused primarily by adjusting traffic lights so that delays on the approach roads to London will avoid gridlock in the central area. The FTA, RHA and British Beer and Pub Association and the FSB have all been concerned that the plans were being pushed through on an unrealistic timescale and the haulage bodies also expressed concerns about the traffic flows and the inefficiency of the London economy and on the safety aspects of deliveries across the superhighways.

Here is a case where economic appraisal and democratic decision making appear to be dichotomous.

Assessment of effectiveness

TfL policy, described above, requires the appraisal of active travel schemes to extend beyond those which involve walking and cycling only to include walking and cycling to public transport. TfL has the benefit that all forms of surface transport – buses, streets, coaches, river, dial a ride, taxi / private hire, Underground, DLR, Overground rail and Tramlink come under its control and responsibility. It therefore has the basis for an integrated transport policy which as yet in Wales we do not. However if the TfL model is kept in mind as an aspiration then expenditure by WG can be appraised keeping movement to / from railway stations and bus stops in mind when determining transport expenditure, the new (2018) rail franchise and bus regulation. Local authorities can then be encouraged to take the same approach in determining transport expenditure.

The underlying principle of local boroughs applying for part or total funding to a central authority is paralleled in Scotland and Wales usually on a match funding basis.

However Transport for London (TfL) is one of the world's biggest transport authorities. It therefore also proposes its own schemes such as the cycling superhighways currently under discussion. This model would fit into Wales only if there was a regional joint transport authority or in Cardiff a Capital Metro with a statutory corporate legal status or a national transport authority. A similarity with TfL would then arise as that body would have a dedicated transport team which could contain the active travel team as exists in TfL. The level of investment in cycling and walking and public transport associated facilities(including routes and waiting and cycle storage at railway and bus stations / stops) shows how a concentrated effort can achieve a high level of cycle use.

The application of the TfL model in Wales could be an active travel unit within WG as in the Trunk Road Agency (SWTRA, MWTRA, and NWTRA) structure but using a bottom – up approach for the originating of schemes. There could therefore be an in house alternative to the Scotland model as assessed above.

The conclusion being drawn from the Scottish and London models is a specialised unit with expertise in feasibility studies, cycle way and pathway design and engineering skills are the most effective.

England

The funding relationship in England has similar flows and scoring methods (Bristol, 2015). Its size in population is 15 times that of Wales and therefore too large to parallel the central/local government relationship in Wales.

However DfT has taken forward research into the appraisal of health benefits and to the use of monetised criteria to provide a BCR for active travel elements. This could be the basis for moving walking and cycling into the mainstream of transport evaluation.

The review of WebTAG is due out in March 2015 and hopefully will contain a new approach to active travel appraisal.

Interventions / Delivery / Appraisal – International Experience

This report gives an overview of the experiences of active travel interventions by governments primarily within the European Union. The Netherlands is considered in more detail. At the request of the Minister a further more in – depth study will be carried out from August 2015. The format / structure will follow that in this report. The narrative will be set out in terms of:

- Activities in other states
- Evidential research in other EU member states; in particular the Netherlands, Denmark and Sweden
- The Netherlands and Denmark “journey” through concept, planning and implementation; what were the policy issues which drove the agenda
- By what process did e.g. Amsterdam / Denmark arrive at the present position and what drove the political commitment for cultural change
- What are the actions for Wales in terms of the key evaluation elements above
- What are the legislative and administrative recommendations for Wales.

Overseas research visits.

The cities suggested are:

- Copenhagen, Denmark
- Malmo, Sweden

- Amsterdam, The Netherlands
- Den Haag, The Netherlands
- Antwerp, Belgium

The on-site and discussions will be divided into two locational groups. At each location we will see the schemes implemented. Discussions will take place with local authority officers, active travel groups, NGO’s and national government officials

European Union member states

Netherlands

The delivery pattern is similar to that in Wales, Scotland, London and England

The responsibility for implementing cycling and walking projects lies with the lower government levels (the equivalent of Wales' county / county borough councils). They have to organise and finance and 'stimulate' (originate) proper facilities with financial contribution from the higher levels.

Government in the Netherlands is at three levels:

- Municipality – mainly local roads e.g. residential streets; business / industrial parks; CBD's
- Provincial – on roads of a regional nature – in Welsh terms, county A roads and trunk roads Financial support is available at a match funding rate of 50% from national government
- National – mainly motorways with little walking and cycling involvement

The main delivery functions are:

- Realisation (i.e. demand analysis, planning, design, feasibility, land processes, construction of cycle path / route infrastructure such as bicycle bridges or junction improvements to reduce accidents or separate traffic, pedestrians and cyclists (shared space not seen as conducive to growth in active travel).
- Development of high speed cycle routes between home and nearby railway station or city centres or out of town business / retail parks and employment areas or education centres. These accommodate trips of up to 7.5 kms (but some up to 15 kms) and are used by bicycles and electric bikes. These are routes which are comfortable, flat, can be used at over 20 mph and have little or no interaction with cars and pedestrians
- Promotion of active travel – marketing related actions to encourage more people to cycle.
- Cycle Park and ride. The Netherlands national government will fund cycle parking facilities near to railway stations and public transport hubs. Because 40% of train travellers use a bike to travel to the station this is seen as a problem the solution to which the national government wish to invest. Many thousands of secure parking spaces are being created at suburban and rural commuter stations while at, for example, Utrecht station 12K cycle space parking garage is under construction and this will only cater for half the forecast need over the next ten years. The local routes must therefore be secure, have good surfaces and be well lit at night. The same principle is applied to walking commuter's facilities. Often it is faster to access railway stations by bike or on foot because of local traffic congestion, low car speeds and a shortage of car parking at railway stations. The Netherlands

government admits it was taken by surprise in achieving the 40% level and is now attempting to meet that demand

Assessment of effectiveness

The model in the Netherlands has three levels – municipality, regional and national. This is similar to the structure in Wales when the regional consortia were in operation. The distinction in delivery between levels of government is also similar in that

- the municipalities (our counties, county boroughs / cities) propose schemes in urban or rural areas which could include residential streets and working areas such as business Parks and industrial estates
- Regional government deals with our equivalent of county A roads and some trunk roads. They process the financial support requests from municipalities and a match funding approach is followed. This is the level at which most active travel capital schemes are decided.
- National government in den Haag has little involvement in active travel scheme delivery. Funding is provided for regional government

In the Welsh context therefore the major part of the appraisal and fund management would be carried out by the now defunct regional transport consortia (or under the 2006 Transport (Wales) Act provisions. A statutory joint transport authority) and included in the regional transport plan. This option is not currently available to Wales.

Netherlands 1: NS – Nederlandse Spoorwegen (Dutch Railways) –

Principles applied to Scotland's new rail franchise (2015) by Abellio Rail were derived from its parent company NS which has been introducing these active travel incentives over the Dutch railway network

In the Netherlands from the 1970's there was severe road congestion in cities and on commuter routes. The existing road network did not stop the growth of car use until car users were provided with an alternative. The application of the 4I's principle led to

- Investment in well - designed cycle routes (physically separated from the motorised traffic in many urban areas; interchanges at railway stations and similarly well – designed routes to those stations from places of work / education and from homes.
- In 2010 the Netherlands Government had to decide how to facilitate this change. A reappraisal of car policy from building roads to satisfy demand (predict and provide) to using the railway. But not through big parkway stations to which car commuters drove to get a fast train service (Bristol Parkway) and have a positive / negative impact on car use. Rather investment

in many local 'cycle points' was undertaken. These provided secure cycle parking and also provided cycle hire which customers joined by subscription

- This was paralleled with large cycle parks at the top seven stations (**Amsterdam** 20k (now 30K) spaces underground; several thousand spaces at **Utrecht, Delph, Linden, Den Haag and Rotterdam**). The *O V Fiets* system (which is equivalent to smart cars lift / car sharing) is the basis of the Bike & Go provision now being introduced into stations in rail franchises operated by Abellio Rail
- The provision of routes and car parks at departure stations is paralleled by an objective to keep park & ride station car parks under 80% capacity. At this level car drivers perceive space and are not enticed to drive further along their route (Netherlands 2010)
- Walking and cycling routes to / from the stations' surrounding hinterland areas (*Fixing the link* – Abellio Rail) required Netherland Railway to be more proactive with local government. Less built up areas were often left out from proper linkages and this is still to be tackled.
- The issue therefore is not just the parking for cycles but also the routes to / from the station
- A similar principle applies to bus stops. This was not discussed with Abellio but it is necessary for Wales to examine the waiting areas and cycle parking at major bus stops at least. Funding levels (discussed below) are a key to the extent this can be developed to cover many more bus stops.
- The train or bus operator can only do this with cooperation from the local government authority. The new ScotRail franchise (won by Abellio) identified with Living Streets (Pedestrian Association as was) and Sustrans cycling and walking routes to / from stations for station travel plans
- The final ingredient was influencing planning and wider government transport policy with an integrated group overseeing bus, coach, rail, ferry and tram. In Edinburgh trams, over 80% of the bus network (Lothian Buses), the tram service and the ScotRail franchise are all in government ownership. Cardiff has a significant proportion but has some way to go to match that proportion with Cardiff Bus, Wales and Borders rail franchise and the proposed south east Wales Metro. Most European cities have a franchising system for both buses and trains. This makes for more effective and comprehensive integration.

Netherlands 2: Cycle Infrastructure

- Bicycle infrastructure is relatively cheap to construct compared with a major cost of a road. They are therefore often ignored (Decisio 2012). However it has sustainability and health advantages, and with the wider availability of electric bicycles can provide for longer trips becoming more attractive
- A bike and pedestrian bridge can have a very positive SCBA return particularly where land used is in public ownership and has only an opportunity cost. This may often be low if built for example over a river or a motorway where land is often in public ownership or in a private company wishing to have sustainability credentials (e.g. port authority / company)

Netherlands 3: benefits identified from expanding cycle facilities (Van der Wijk, 2014)

- Park (cycles) & Ride facilities at stations and public transport hubs were not providing sufficient capacity for the 40% of train users who cycle from home to station. There were local residential street issues near to railway stations where commuters were parking bicycles. Land was at a premium at these public transport hubs because of use for cars and public transport and retail or office developments.
- This problem arose because the 40% cycle mode was neither planned nor expected but has grown as it became more difficult in time terms to get from home to the local station by car. Station car parking was also expensive. Public transport (bus) and car travel into many stations was caught up in this congestion with consequent longer journey times. However it 'was the people's choice' and it became the best option. It was difficult at first but car parking P&R land was converted into cycle P&R stands. Municipalities have also been more decisive in creating cycle parking at stations in their area
- Facilities at major stations are secure and extensive E.g. at **Utrecht** a 12k cycle garage is under construction. This will accommodate 50% of expected demand growth over the next ten years but is planned for longer term growth
- The developing technology in higher speed electric bikes and high speed comfortable cycle routes has meant little interaction with cars or pedestrians with the consequent growth in longer distance (up to 7.5 km and some to 15 kms) journeys
- **Almere** a new town (30 km from Amsterdam) begun in 1984 whose transport network was based on cycle infrastructure. The growth of cycle has increased with usage mainly for recreational purposes. Only 10% of cyclists commute despite a cycle parking garage at the railway station and cycle ownership per household is far higher even than the Netherlands average. This has been attributed to the design of the city as 'bicycle based' the sales of electric bikes has risen but sales of conventional cycles have fallen. This is in contrast to some UK cities begun in the same era as overspill towns such as Milton Keynes where the car was the predominant planned transport mode
- **Houten** is a town near Utrecht. The car commuter is faced with congestion and detours giving a long journey time. A high frequency train links the two urban areas with good connectivity by bike to the railway station. This total package has encouraged bike / train interchange which the Netherlands government has set as one of its transport objectives (see Abellio section above) Each part of the town has a direct cycle route into the CBD to shops and offices (this is the plan currently under consideration in Bridgend). The comparative journey by car has a longer journey time through driving out to the ring road and then returning in but only on specific roads which lead to the city centre. Hence it is particularly successful in cycle's modal share.
- In other towns where cycling is much lower it is the structure of the town and its streets which is less attractive for cycling. Travel time for the total journey from home to work/ school/ retail is a major factor in modal choice even in the Netherlands.
- In some older cities which have grid structure a straight line trip from home to city centre makes it more difficult for bikes to compete

Norway

Three – city study (**Hokksund; Hamer; Trondheim**) of walking and cycling tracks achieved BCR's of 4.09:1, 14.34:1, and 2.94:1 respectively

The effects were measured through

- Traffic accidents (no change)
- Travel time for pedestrians and cyclists (no change)
- Security of travel being separated from motorised traffic
- Children transferring from school transport to walking (50%)
- Reduction in short term absence from work (by 20%); 50% of new walkers and cyclists would see health improvements
- Moderate amounts of daily physical activity would reduce premature mortality
- Reduced risk of severe medical occurrences – cancer, type 2 diabetes, high blood pressure etc. measured through welfare loss costs. This welfare loss of 60% is the same as for road accidents in Norway
- Externalities (environmental) impacts were reduced CO2 emissions, noise, congestion, infrastructure costs and parking costs for businesses where car trips were replaced by walking or cycling

Denmark – Copenhagen

The approach to prioritising cycling schemes is quite different to that in the UK (Neils Jensen 2015). Walking is not planned as a means of transport but all roads have pavements

- New walking paths are included in any new 'Green Cycle Routes' implemented as the GCR Plan 2000. This has achieved half of the total (100km) route system.
- The priority currently is to build cycle tracks along all the major roads in Copenhagen (following the Cycle Track Priority Plan 2006 – 16). There are 350 kms of track built and the remaining gaps now being filled – involving another 40 kms expected to be completed on target by 2016. This implementation programme was planned and financed as one project provided on a continuing basis with a ten year financial commitment. This was vital to its success.
- The latest development is the construction of the Cycle Super Highways – commuter routes for longer distance travel which will connect the centre of Copenhagen with approximately twenty suburbs and. Two routes are completed and two others being planned.
- Park and ride for cycling is working well where it is provided. It has improved at many stations in the Greater Copenhagen area but it does not have the high standard achieved in the Netherlands. However bicycles can be taken free of charge onto suburban (S – banner) trains It was suggested in Copenhagen however that the possibilities for 'seamless travel' could be more robustly focussed. This was one area where evidence suggested there were

considerable possibilities for attracting short distance cycling (and walking though the current policy did not include pedestrians).

- New *city bikes* have been introduced in Copenhagen last year for use by commuters. Their uptake is currently being measured

Denmark – Odense

- Cycling has a modal share of 25 – 30 %. Population 170k – about the same size as Swansea
- This has been attributed to its role as the first National Cycling City (1999 – 2002) and the continued history of cycling route provision; a high density cycle parking area under the railway station; an on street hub for 1k cycles with minor repair facilities; extensive cycling parking both open and covered in central and retail areas
- Shared spaces have little conflict – due to inter modal awareness and respect. This feature is one which clearly takes considerable time to achieve.
- The city has a bike hire scheme
- Their success in Denmark of increasing cycling as a commuter mode was less to do with things (e.g. cycle routes although they played a part) and more to do with the commitment of those supporting cycling as a mode
- The behavioural aspects are discussed below – accessibility to cycling to all; confidence of cyclists (all ages and gender) in the city centre; the simplicity of provision; the tolerance of Denmark’s drivers and the fact that there are now so many cyclists it is a part of everyday life.

Spain

- Barcelona bicycle sharing / rental scheme – benefits to health, air pollution, traffic accidents rates, reduced accident risks; non road user benefits from reduced air pollution

European Union PROMISING project ((EU 2000)

Using BCR’s as the indicator of success this project identified the best results from:

- Speed restrictions in urban areas (e.g. Cardiff) are increasingly being used to reduce the risk of accidents by over 50% (BCR 9:1). It is not clear if this includes the economic cost of extra journey times
- Separate cycle paths (with armadillos or curbs) have a positive effect on safety for car users and cyclists; they also benefit traffic flow (BCR 9:1)
- Giving cyclists the right of way at traffic junctions through a stopping line ahead of that for motorised traffic over the full width of the road; improves safety for cyclists and other traffic (BCR 12:1)

Other developed industrial (high GDP / head) economies

United States of America

- A study covering **San Francisco, California; Portland, Oregon; Chicago, Illinois; Washington DC.**(PfB, ABW, Protected bike lanes mean business, 2014)
- Objective is to attract white collar workers – software developers; graphic designers; management consultants who are redefining the service sector and who are a skilled workforce seeking a general preference for urban living
- Relying on ‘just a few inches of paint’ to give people security to cycle on busy streets is insufficient to attract the numbers required to indicate success. It requires curbs, planters (armadillos); parked cars (where the bike lane lies between them and the pavement) providing protection from moving vehicles
- A change from providing for the motor car, retail analysts concluded that ‘cars don’t spend money – people do’. A close study of the ways people move and do business in the urban environment this new approach to cycling (and walking) is boosting sales in retail districts by using for optimal ways to use the public realm.
- Protected bike lanes increased cycling in urban downtown areas by e.g. 56% on **Columbus Avenue New York**; 66% on **Spruce and Pine Streets Philadelphia**; 115% on **Market Street San Francisco** and 200% on **Pennsylvania Avenue** (on which the White House is located) **Washington DC**
- Productivity also increased at the American Bar Association HQ in **Chicago** by up to 52% with up to 32% fewer sick days. This it believes came from bike commuting and the signalised and protected bike lane on **Dearborn Street** which improves safety for both cyclists and motorists.
- Companies such as CREDO Mobile had decided to ‘pay premium rents to locate in downtown **San Francisco** so our employees can enjoy the benefits of public transit – BART (mass transit) and Muni (buses, trolleys trams) – and bike to travel to work. With improvements in the bike plan more employees cycle to work.
- Companies provide changing / shower facilities and secure bike parking at their offices.
- **Midwestern United States** research – if 50% of short trips were made by bicycle during the summer months – reduced air pollution, improved physical fitness leading to significant health and economic benefits
- Research 2012 shifts from car to cycling or walking showed benefits in physical fitness, ambient air pollution, reduced pollution for non - road users and changes in accident risk. The research suggested that switching mode to cycle could increase air pollution costs unless the cyclists were segregated from major roadways
- In the United States suburban roads rarely have sidewalks (pavements) A study in **Dale County, Wisconsin** estimated that ‘residential sidewalk construction’ would be repaid by the health benefits of increased physical fitness and reduced vehicle air pollution
- **Portland, Oregon** has been a supporter of public transport interventions since the 1980’s when the urban tram system was constructed. The city has also encouraged cycling and walking. The consequence of rebuilding the entire 274 mile bikeway network and initiating the Smart Trips programme has resulted in health care and fuel (gasoline) savings BCR’s on average of 2.5:1

and much larger BCR's when reduced fatal accidents and pollution related deaths were considered.

Australia - Sydney

Improvements to the Sydney Regional Bicycle Network achieved economic benefits including health, journey ambience which provided 41% of total benefits and a BCR of 4:1

New Zealand

- New Zealand Government research – substantial health benefits including health sector cost reductions

Chapter 6: Recommendations on options for the most effective delivery in Wales

Context

The overall measure of effectiveness of the delivery model has been based on the level of investment and the numbers of people turning to walking or cycling as a part of their purposeful travel and using the infrastructure provided.

The context in which the model is to be used is part of the recommendation about effective delivery options

Subject to the pre-requisites set out below the options most appropriate for Wales is to take the Scottish model

- An increase in funding per annum to a minimum of £10 per head (£30m pa)
- A long term spending plan of three to five years to enable all types and sizes of schemes to be considered
- The match funding aspect from local authorities encourages both local and national planners, finance officials and ministers / councillors to maintain an interest in active travel funding
- Walking and cycling not in mainstream appraisal (with roads budget)
- Walking and cycling has to be brought into the mainstream appraisal process with all other transport schemes if it is to achieve a level of funding which the evidence overseas and from Cycling England (SQW 2007) suggests.

Rationale

- Even the figure of £10 per head is suggested as being low if we are to catch up with our aspiration to approach in several years' time the same position as the Netherlands. To do this Wales has to increase expenditure to £10 per head in the immediate financial year and to £20 per head in the near future - a total cost of £30m next year and £50m per annum in future years.
- For Wales to move forward with active travel schemes which have a noticeable impact on modal split there is a need to have a critical mass of project construction and expenditure so that cycling provision is far more comprehensive than now and that the level of walking and cycling in the urban areas of the Netherlands can become a target position for similar areas in Wales. The bicycle also then becomes more 'visible' to the motorist and a more familiar vehicle. The behaviour section below returns to this.
- An integrated transport approach to walking, cycling and public transport at origin and destination points of the journey has to be part of the overall policy rationale. It can represent for example a commuter journey from home to work by cycling or walking or a multi – modal trip via public transport.

- A more flexible approach to funding would certainly aid local authorities to deliver a properly identified and assessed network of active travel schemes which could make the greatest impact, rather than delivering the quick-wins on an annual basis. This should also include a ring-fenced funding pot specifically for active travel to give local authorities an idea of the amount of funding likely to be available to delivery such schemes.
- A potential alternative option would be to provide single, multi-year indicative allocation direct to local authorities (e.g. £1m over 3-5 years) to deliver active travel schemes within the area. Funding should then be allocated on a similar basis as indicated above, with staged awards for design and delivery based on agreed criteria and priorities (in time this could use as their basis the Integrated Network Maps to be developed as part of the duties of the Active Travel (Wales) Act).
- Amalgamate the funding programmes for Safe Routes in Communities with a ring-fenced element of the LTF funding programme to specifically deliver Active Travel schemes. However, until the integrated network plans have been completed by local authorities there is merit in retaining a separate funding stream for schemes identified locally through consultation with local residents, community groups and schools.
- WG to hold a national, multi-year ring-fenced funding pot which all local authorities can bid into at different times depending on the stage of development of a scheme. However, this would favour those authorities already well advanced in terms of identifying active travel networks although would enable local authorities to progress design of schemes with a view to securing funding to construct at a later date.
- Therefore, it would be beneficial for local authorities to be able to draw-down a specific element of funding in the year of delivery, which could be retained to undertake post-completion monitoring for 3-5 years to provide a more robust evidence base for the schemes.
- This suggests the TfL model. But the establishment of a stand-alone unit within or outsourced from WG is the best option type available
- The appraisal process currently used in Wales for schemes exclusively relating to cycling and walking (i.e. excluding road schemes with active travel facilities attached) is based on scoring. A similar descriptive / scoring version is used in Scotland, English counties and DfT and TfL. These methods are superior to a descriptive - only methodology as they are able at a local and national to:
 - Capture the full benefits of the scheme
 - Prioritise funding by WG and local authorities particularly if match funding is required.

- Using BCR on road schemes concentrates on journey time savings and reverts to the appraisal processes such as CoBA where road user benefits were uppermost. Appraisal has come a long way since then but a further step is now required.
- The biggest benefits from walking and cycling are those associated with personal health and the costs of an unhealthy population, but also included are air quality (CO2 emissions) and other environmental benefits and vehicle economic resource costs coming from road congestion especially during peak periods
- On such a basis the evidence shows that walking and cycling could achieve high BCR's and should then lead to strong Government support through increasing health and fitness, reducing traffic congestion and reducing pollution.
- The importance of BCR's in enabling walking and cycling to compete for funding with road and rail infrastructure schemes becomes even more critical when the WG becomes responsible for railway infrastructure investment. Local authorities also have scarce capital and revenue account resources. If the minimum suggested figure for active travel capital investment and revenue account expenditure on maintenance or promotion / information is to achieve the comparable level with other parts of Europe (at £10 per head equivalent to £30m per annum in Wales) then a robust prioritisation appraisal process is required

At present only TfL have a monetised element and that is in developmental stage. The recommendation below recognises that position.

Recommendation

Based on the assessments of the three models considered as the appropriate alternatives the recommended options are set out below.

A modified Scottish model is the recommended option

This would be out sourced arms - length operation concentrating on active travel schemes and allocating expenditure on the basis of a minimum of £10 per head per annum (a total of £30m)

The difference would be that a new organisation would be created. It would have expertise in feasibility, design and engineering working with the WG and local authorities. This would ensure that all schemes put forward for funding would meet the criteria before significant resources had been committed to the pre - construction work by local authorities.

The balance of walking, cycling and public transport interchange schemes would be guaranteed through the WG officials' supervision of operations and the reporting process on scheme implementation and expenditure

This is the preferred option

The TfL model would be an alternative

This model has the same staff expertise characteristics as the Scottish model and might be the option in the future. However WG do not currently have the breadth of experience as yet of TfL in this area nor is there sufficient expertise in – house at present.

Many local authorities would prefer the retention of the current arrangements which would see the overall programme being managed by WG with funding being allocated directly to local authorities without the use of an arms-length body or an independent body. This they believe would ensure clarity of purpose in terms of priorities between the grant funders (WG) and the deliver agents (local authorities), and would ensure clear lines of communication.

Chapter 7: Identify relevant funding sources and make recommendations about how funding packages might be developed

Any combination of the following sources may be packaged together. Developing such packages can be set in principle (e.g. match funding by local authorities) or by negotiation with developers e.g. retail parks, housing estates (using section 106) or by agreement showing retailers the evidence on spend levels by cyclists/walkers as higher than that of car users.

European Commission

Several types of grant may be available from the European Commission particularly following the new round of EU funding which begins in 2016. A range of possible grants is set out below but this is not an exhaustive list. If full advantage is to be taken of this funding then WEFO should be involved at this early stage. WEFO has the full information and the expertise to gain the maximum funding from any application.

Horizon 2020

This is a research and innovation programme with specific calls related to themes and actions set out by the EC including transport innovation. The *societal challenges* as they are now called include

- Health and well-being
- Demographic change
- Transport
- Environment
- Societies

This becomes available in 2015

European Rural Development Fund (ERDF) / European Social Fund (ESF)

These were known as Convergence Funding. The two streams are rural development and society. They are capital schemes / deliverable projects which could be used to part fund cycle ways, footpaths and active travel access to public transport in rural areas or in areas lo low income, poor health, higher levels of unemployment or other social deprivation aspects. The funding covers both capital and revenue account (in WG terminology) expenditure.

This funding runs from 2014 – 2020

Rural Development Plan

This replaced previous RDF schemes. It can be targeted for the Wales Rural Development Programme, applied to regeneration in rural areas. It is funded by WG and the European Agricultural Fund specifically for schemes to aid rural

development and focuses on agriculture and farming (including employment so WEFO can advise on its applicability in active travel for work / education purposes where employees may not have a car for example. This might also be a source of funding for cycle ways, footpaths, rights of way and public transport (in general and as part of active travel modes). The objective of the funding is improving rural communities' inclusion of which connectivity (transport) is a key provider. To put the funding value into context regeneration and sustainability grants to Carmarthenshire have totalled £8m in 2007 – 2014.

Other non – transport EC sources

There are also other sources which may not immediately look as if they apply to transport schemes. In health schemes, green schemes there may be funding given the benefits derived from active travel. Health impacts, the research shows, have the biggest benefit from active travel investment.

Further work needs to be done on bringing together several sources of funding (e.g. health, green projects, Sustrans, WG, social services, local authorities and WG regeneration) grant options into a combined bid. This has the opportunity to create a 'single' larger active travel scheme funding 'pot'.

WG schemes such as Sport Wales wish to encourage more people to take up competitive cycling. It has been suggested that a causal link might be drawn between active purposeful travel bring people into cycling for everyday activities who may then progress into sports cycling. Again WEFO is the source of information on the possibilities derived from such tangential options to transport per se.

Local authorities may use this funding as an element of their match funding contributions

Welsh Government and the block grant

As the WG single income stream is currently the block grant what this provides is an indicator of the total transport budget and therefore then active travel budget. However to put Wales on a par with Scotland and London the expenditure allocation to Active Travel should be circa £30m per annum. This decision lies within the responsibility of the WG

Non transport areas of WG

There are aspects of transport expenditure which come under for example the health and education ministers and the economy division of the economy, science and transport minister. There are often negative efficiency impacts on the highway network resulting from the opening of new, or expansion of existing schools, hospitals, factories and business / retail parks often funded by WG. But how much of that impact is in fact funded as part of the scheme? This is a parallel issue to that of

private developers in that both generate additional traffic. Some of that funding may then be directed into active travel schemes.

Local Authorities - Joint funding/match funding

This will not be a popular financial arrangement but local authorities in Scotland have to provide match funding within a package if they support active travel schemes and wish to indicate that they are. If funding is provided in this way the consequence can be inconsistency of standards and provision between counties / county boroughs.

Property / Land Developers: Planning Act s106 / Community Infrastructure Levy – Joint funding

Section 106 (Planning Act) provides for local authorities to require land developers to make financial contributions which provide additions to the public realm. This may be a £600m development in the centre of Cardiff or 30 houses in a local community. However to achieve the contribution it must be shown that there is a direct impact from the development. It is no longer possible to 'pool' impacts from several developments to achieve a total amount.

Infrastructure such as cycle ways can receive such funding. However the land value and consequent sale value of the houses is crucial in terms of the profitability of the developer's profit from the site. Before the recession profits were good and developers would pay for e.g. a new school or a new or widened access road to the commercial, industrial or housing development. The ideal would be a roadway with bends and speed limits not conducive to cars, a pavement and a cycleway.

Private sector housing development companies will insert these costs/losses of revenue calculations as a part of its bottom line for each individual site. Removing a house from a development to facilitate the equivalent land requirement for a cycle pathway along the road will reduce the profitability by the value of that house. It has been suggested that minimum road standards are being applied in many housing developments with minimum width for roads and pavements and no provision for cycling other than on shared space. In the current climate developers and local authorities with housing targets have to be seen to balance against the developer postponing the new house construction.

It has not been tested to see if several developers along a cycle route should have to make such payments by section. These payments cannot be retrospective; they are a part of the planning consent process. The distance from a development may also affect the potential developer liability. In Swansea several developments are taking place in the Gorseinon area but it is not clear if they could be asked to make a contribution to providing a through link to Swansea by the completion of a gap in the local cycle way (off NCN 4). Developers around the Swansea suburbs it would seem

could not be asked to contribute to the city centre ends of cycle ways running near their developments

The Community Infrastructure Levy has a wider geographical area over which it can be effective. Remaining with the Swansea city example, the CIL could levy a charge on several developers to contribute to for example cycle lanes specified in the Local Development Plan. This might include the city centre option. However priority for the use of these funds is not transport specific and the allocation to active travel in particular will be in competition with other infrastructure schemes.

In any event developments such as new offices, retail and housing place significant demands on Wales' transport system. This needs to be address if government is to be clear that a development is viable and sustainable. This does not just refer to the developer's bottom line but to the viability and sustainability (in terms of economic, social and environmental measures). Consequently the WG and local authorities have to work together to secure developer conditions, through planning consents, to secure developer contributions for the necessary transport improvements. This will ensure the success of the development but not at a cost to efficient operation of the transport network for all users.

National lottery

Applications may be made to the National Lottery as a major benefit of cycle ways is the health and well-being of communities

Private companies – sole or joint funding

There are many companies whose employees have requested showers and changing facilities for those who currently or would wish to travel to / from work by bike. One case study in Cardiff has been highlighted but many other companies had either taken their independent action to make such provision or had made provision for bicycles through the Bike2Go scheme. While these companies may use the construction of secure cycle storage at work as a corporation tax deductible expense and will not incur significant cost for a few employees – for example the conversion into locked, cage style cycle parking from car parking spaces in their privately owned car garage – if the take up was great (as an active travel policy would hope) then several suggested that the expense would be unacceptable and would seek available what match funding grants.

Retailers - sole or joint funding

A considerable amount of research summarised in this report has shown the positive impact on retail spending levels from those who walk or cycle compared with car users. In many European cities the retailers encourage cyclists to visit their outlet by providing, on their shop forecourt, Sheffield stands or more sophisticated designs with advertising for their store to attract customers. Good examples occur in many

Dutch towns and in Belgium for example in Antwerpen (Antwerp) a major city and Hove a commuter small town on the outskirts of Antwerp. Here many of the retailers in particular in Hove have such facilities funded by themselves as they believe such cycle facilities attract customers. It would appear that local authorities are supportive of these structures and planning consent is almost a formality unless they constitute an obstruction. Many are on land owned by the retailer.

In Wales some out of town or edge of town retail developments have secure cycle parking but it is not as widespread as in Belgium, the Netherlands, Denmark (in particular Copenhagen where they are primarily provided by the city authority) and Sweden .

Employers in almost any manufacturing or commercial sector might be persuaded through planning incentives or fast track through planning procedures where no disadvantage accrues to neighbouring properties. Requests from staff or consideration for the wellbeing of employees might be tested. Information could be provided for employers on what they could do, often in discussion with local authorities was found to be an issue.

Provision of cycle parking at work (public and private sector non transport organisations)

- The redevelopment of the Glasgow City Chambers complex included secure covered cycle parking (60 spaces). It also has a fleet of fifty modern Pool Bikes (with an intention of displacing pool cars for mainly short journeys within the city). This has led to a substantial increase in cycle use.
- The Cycle Friendly Employers Award has at its core advice to employers on promoting cycling, providing training on cycling proficiency and safety. Organisations such as Cycling Scotland, Sustrans and the Energy Saving Trust support this.
- Capital Law a leading firm of Cardiff solicitors have provision for cycles and showers /changing facilities

CASE STUDY Capital Law Solicitors Cardiff (CL, 2015)

The decision by Capital Law to install secure bicycle storage and shower and changing facilities for staff wishing to cycle between home and work is a part of its well-being policy and was a response to demand.

From 3 staff members in 2011, there are now 11 members using the Bike2Go scheme. Staff are also able to use their own bikes

The Capital Law (CL) offices are in the central Cardiff Enterprise Zone, south of the mainline railway from the traditional CBD but adjacent to the Cardiff Bay area.

A further set of incentives for people working in the Tyndall Street area to switch from car to bike / walk or public transport as their journey mode was:

- *Cardiff City Council removed low cost rough ground car parks and most have become development land*

- *Parking meters were introduced for on street parking*
- *Remaining car parks have pay and display charging schemes.*

There were in establishing the facility several factors involved:

- *A positive decision by CL when planning their new offices to include cyclist facilities in the design*
- *Seeing expansion possibilities with the provision of 32 secure bike places in a locked cage and 14 with Sheffield Stands*
- *Part of the firm's health and well-being policy where walking and cycling is known positively impact on business focus but focussing on surroundings en route*
- *The existence of the Bike2Go scheme. This is a Government initiative to encourage employees to leave their cars at home and make significant tax savings. The bike and accessories (chosen by the cyclist) are purchased by the employer from a Halfords store and 'hired' to the employee. The equipment value is then repaid monthly. Cycling to work has to account for at least 50% of work trips. However there is no minimum distance and the bike can be used for any part of the journey For example an employee in Neath can cycle to the railway station; park the bike ; take the train to Cardiff Central and walk the short distance to the office*

A combination of a forward thinking, modern sustainability aware company policy has of course to be accompanied by provision of e.g. segregated cycle ways; cycle bridges (as over the main line in Cardiff) continuous cycle routes; secure cycle parking at bus / rail stations. These and other factors contributing to the success of an active travel policy is set out below. While private companies can play their part there is also a need for government to provide the necessary route network and other facilities to encourage a new range of potential cyclists to switch from car to cycle / walking

Part 3: Synthesise key messages arising from evidence about behaviours of all road users and make recommendations on how safe and considerate behaviours can be promoted

Chapter 8: Review evidence from relevant expert organisations

Several research studies have been published by TfL, the RAC Foundation and the AA. The commentary here is derived from these reports and primary research interviews.

Interest and lobby groups representing for example cyclists, car users, HGV companies, taxis and pedestrians have produced statements and views as this is what might be described as a contentious issue.

The interaction of different users on shared road space indicates that each has a different set of needs and operates at different speeds. Initiatives may be taken by highway authorities and the question is - what motivates customer response to initiatives? These groups are car users, walkers, cyclists (pedal and electric powered), powered 2 – wheel motorcycles and mopeds, taxis, white van (man), bus drivers /passengers and goods vehicle drivers.

Conflict arises from users:

- Disobeying the Highway Code (much or all is based on law; some on common sense which is often lacking)
- Traffic travelling at different speeds
- Using shared space

Shared space

The objective of most travellers is to get from A to B in the quickest way possible. This might be travel to work, hospital and health services, young people to school, older students to colleges and universities, travel to entertainment or leisure facilities or commercial deliveries by small van or articulated lorry, whether longer distance or local.

The car can give more freedom and control. In London TfL can manipulate traffic lights and therefore traffic flow freedom between different users. Buses have priority at all lights where there is a bus lane; priority can be given to cyclists at junctions.

However there remains a syndrome of

“I’m more important than the cyclist, bus...” from the car users and

“I’m saving the planet; I’ve got more right to the road and I can drive through pedestrian areas past the sign that says no cycling”

This doesn’t apply to all such road users. There are for example cyclists who are confident without being irresponsible – they know the route, have complete control of their bike, are relaxed, “can look over their shoulder without wobbling the bike”. There are car drivers who have been on a traffic police authority driving awareness course, are advanced motorists and that awareness results in their driving for other drivers, reading the road, looking 500 yards, 100 yards and immediately ahead.

But there is what those dealing with shared road space have referred to as:

Me – centricity

It results in people thinking aggressively when they drive. When they see someone breaking the Highway Code they get angry.

“There are cyclists who jump red lights, ride on pavements at high speeds, just miss old people, come up from behind and pass me on the left when I want to turn left”

“The main group are white males, lycra clad, confident. They sped past pedestrians and just miss them. A pedestrian steps out into the traffic and fails to see a silent bike coming up at speed on the inside of parked cars” All this from a TfL study (TfL 2014c, 2014g). The numbers involved are a false perception and are low relative to traffic flow. But the consequences of an accident bring the issues into sharp focus

The RAC Foundation report (RAC 2011) puts many of these issues into what it refers to as the road user’s ‘moral model’ which has two parts:

1. Attributes psychological characteristics (objectives, motivations, attitudes, character traits) to road user types (observed characteristics – e.g. vehicle type or driver behaviour)
2. Attributes moral characteristics (rights, responsibilities, legitimate claims) to different types of road user in types of place

The moral model can explain or evaluate other road users behaviour but there is no definite research conclusion on our anticipation of other road users’ behaviour (see training road craft below)

These moral models can also have an effect on policy and practice relating to:

- Behavioural change – to tackle undesirable behaviour (e.g. aggression popularly called road rage. They may also support wider objectives such as improved public health, mobility, economic efficiency and environmental impact.
- Understanding the ‘customer’ (i.e. the different road users) – to assist policy makers think about the acceptability of interventions and anticipate objections or misunderstandings
- Understanding the evolving culture of road use – so policy makers and practitioners spot opportunities to gently shift the system in a desired direction and track / manage threats to the intervention.

Roads are a site of intense interaction between people. A PACTS (2010) study compares two situations.

1. An everyday event is two cars passing in opposite directions; each keeping to the left requires coordination and collaboration between two people who may never encounter one another again.
2. But some movements are more complex. On many urban roads large numbers of people using many different modes of transport (cars, lorries, vans, bike, and foot) are simultaneously interacting within 'the spectrum of public life'.

The success level of these interactions is often dependent on whose point of view is being sought. One research workshop (Christmas, 2010) complained of a tendency for some cyclists to travel in a group two or more abreast making it difficult for car drivers to get past.

Two views emerged

1. "Normally a group; well up the road; cars going at 20mph behind them. They don't move over; it's selfish"
2. 2 group of 20 cyclists; they can't keep pulling into single file all the time, it's not practical and they can't ride in single file all the time because they are talking and training; they are working as a team exactly the same as a slow car; everybody's entitled; it's not against the law" This latter form of response was from people who also cycled

The first response says cyclists are selfish and unreasonable; in the second they are quite justified and reasonable. The difference the research suggests, is dependent not just on the facts but on their moral model.

Other research suggested that the cyclists rarely had third party insurance against damaging other people's cars in a collision or in an accident when the car was scratched or the cycle badly damaged. This view was that as the car required insurance by law so should the bike. It did appear to be a recent complaint possibly because the number of bicycles on the road had increased actually or in their perception.

In other research by TfL cyclists were asked to keep a record of their travel behaviour. Responses included – "I always do it; it's safe; routine action based on perception and experience". Although some respondents did initially break the rules (e.g. on pedestrian only areas) as the survey progressed over time they reconsidered their actions and berated fellow cyclists for breaking the rules.

In outer London TfL made comparisons with provincial towns for example in Wales and in particular, towns in rural Wales. There was a quieter environment; it was less frenetic; for mid-distance journeys the car was the only option as was the school run, shopping and the work trip. In rural areas the opportunity to switch from car to public transport was limited and the only other options were a lift, car sharing or community buses. Thus the research showed a limited cycle park and ride possibility compared with London. The public transport frequencies were vastly different from every two or three minutes by rail, bus, tube or tram to every three hours or once a week by bus.

Social media

Another form of behaviour by cyclists has been put forward by the Licensed Taxi Drivers Association (LTDA 2015). They suggest that the cycle lobby has tried to silence opponents of the mayor of London's cycle superhighways proposal. Many transport and other businesses are afraid of the social media behaviour of the cycling lobby since the LTDA announced they would be considering going for a judicial review of the superhighways – its website hits went up by 4000%. "They really believe it and they can't accept another view. It's almost a religion to them – their fervour is – it's either their way or the wrong way"

Chapter 9: Identify key issues to address

Several issues on behaviour emerge from the research by leading bodies but it is clear that the transport world in the UK is a long way from a satisfactory relationship between pedestrians, cyclists and motor vehicle users. One should also not presume that all in the Netherlands, Amsterdam or Copenhagen are happy with the emphasis on cycle expenditure.

Enforcement of rules

A key aspect is the misunderstanding of both motor vehicle users and cyclists of the legal requirements under which the both operate. Consequently TfL and the Metropolitan Police have a programme of traffic enforcement at identified accident hot spots where occurrences of collisions or even deaths are high. The KSI measure records the number of people killed or injured at road traffic accidents

Behaviour and habit

The essence of this aspect is discussed in Chapter 8 above. Much of the misunderstanding between car / lorry drivers and cyclists comes from the formers inexperience of the new higher level of cycling on Britain's, in particular, urban roads. Building up this confidence, a need for more training on both sets of road users and making allowances for the other modes has to now only been partly realised. As in the case of other major shifts in behaviours it can take a considerable time. The major reduction in the smoking habit took 30 years and a combination of legislation and an awareness of the health implication to the smoker and those around them who inhaled the cigarette outputs.

In the 1950's and 1960's the smoker had been an aspect of daily life for two centuries. Popular culture increased the rates of smoking in the previous 50 years; cigarette manufacture was major employment sector; film stars and characters smoked; it was perfectly acceptable. Put the use of the motor car into that same context. Regulations have moved to reduce the air pollution impact; the health benefits of active travel are being promoted and the use of the car has peaked (Jones et al 2013) with DfT forecasts of future growth in car use being critically examined; the car industry remains a major employer through production and maintenance garages. But the car continues to play a key role in popular culture and in our daily lives. .

Road design and engineering

The segregation of cyclists, pedestrians and motor vehicles (mainly cars in numerical terms) has a long way to go. This use of shared space continues to emerge in the discussion on safety. It is for that reason that it has become a behavioural issue. As outlined above there is a lack of understanding between the different groups of road users although operating together over time could give a lasting solution.

The non-existence of segregated routes, safe routes to schools and stations / bus stops and cycle and walking signage is a reflection of them not being a high priority in many local areas. This has therefore become a key issue in the debate.

Chapter 10: Recommendations on appropriate actions to promote safe and considerate behaviours by all road users

More research required

The behaviour aspect has been in evidence for many years. What has now brought it to the forefront is the increase in the number of cyclists and walkers on purposeful journeys between home, work, education, leisure and health locations. Ironically the car / HGV driver is also at times a cyclist and certainly a pedestrian. More research is therefore needed

Economic impact

The impact on small businesses in particular (as highlighted in the FSB response to cycle superhighways) indicates that changes may not be easy or economically or financially viable. Care has therefore to be taken by government when determining implementation timetables for new schemes; these may not be objected to per se but businesses large and small may have to make adjustments to their operations.

20 mph default speeds

A group '20's Plenty for us' has launched a campaign in Scotland coinciding with the Scottish Parliament (March 2015) regarding powers to set speed limits and the Wales devolution white paper (WO, 2015) proposals to transfer power to the National Assembly for Wales (LTT 2015).

Sustrans Cymru hopes WG will look at the evidence and make 20 mph the default speed to achieve higher safety levels for cyclists and pedestrians.

There is however limited little research evidence on their impact on safety for pedestrians or cyclists.

The Institute of Advanced Motorists warned of speed variations across the border.

A primary research survey of retailers (2014) where the 20 mph speed limit has been set were concerned about a medium term impact on sales/patronage when the limits were fully enforced. Poor signage was also a comment.

The IAM also pointed out that the Sustrans proposal would also make local authorities "put 20 mph speed limits where they've already decided 20 mph would be inappropriate".

The FTA and RHA were considering the proposal.

The slowing down in speed by over 30% where LAs considered 30 mph is safe to drive will incur costs in journey times, efficiency and driver wages if it was universally the default speed (FTA, 2015).

Education

A training and educational programme is needed for cyclists, pedestrians and vehicle drivers to enable them to understand one another and operate safely in shared spaces. This may be part of the driving or HGV / PSV tests (statutory) or cycle proficiency tests (currently optional but could be considered as a statutory requirement).

Motor vehicle driver behaviour

Many bus companies now include in their driver training for new entrants or on revision courses the awareness of cyclists. They have had this awareness for pedestrians and passengers stepping on / off their buses for many years. But the increase in cycle numbers and altercations (real or perceived) make a new training element essential.

This could also be required for HGV drivers and WG and local authorities could make cycle / pedestrian awareness certification a requirement to win a vehicle contract for buses or trucks

For many years some police authorities / driver training schools have provided an advanced driving awareness course. These are of course not free but the car insurance sector might be encouraged to take the passing of such a course as a means of assessing the premium. Availability of the current police driver course COAST (concentration, observation, awareness, space, time) would be an ideal to strive for in improving driving behaviour and in reducing accidents

Lothian Buses in Edinburgh have on all their buses a large red circular sticker on the rear of the bus with the words in large print '**Don't pass on the inside**'.

Enforcement

Transport authorities (WG and local authorities) are working with the four police authorities (and the Police and Crime Commissioners) to develop a policy of enforcement within the known restricted finances. Deploying police constables or CPSOs on duty at for example junctions to stop a cyclist overtaking on the left of a motor car or bus, running a red light or a driver entering the cycle box, parking on a cycle lane or on the pavement with the intention of reducing casualties. It is often sufficient to have visible policing to reduce infringement or temper people's action

All these actions are discouraged in the Highway Code and are all against statutory law. Action taken elsewhere is that the police give advice on the first occasion and a fixed penalty notice on subsequent occurrences. (Note TfL and the Metropolitan Police issued 14k fixed penalty notices to cyclists, HGV and car drivers last year) The objective is to make people think about the law; about where cyclists should go and when they should use lights. A short term scheme operated in Cardiff City Centre last year where the pedestrianised area has a no cycling byelaw. This can have a permanent impact although evidence suggests that users go back to old habits once the police leave the site. Others take the hint that the police may turn up unexpectedly. In Dublin this was very effective in keeping bus lanes free of cars during the rush hour in Dublin when they were first introduced. (Only three Garda covered the whole of central Dublin but on a random basis)

There are an increasing number of potholes and large puddles on the roadside which can cause pedestrians to be splashed sometimes extensively by passing vehicles. This will not encourage them to walk in place of driving again. The issue also applies to cyclists who if they are to keep within the law and off the pavement will have to cycle through the puddles. Any driver who causes damage to any object could be charged with 'driving without due care and attention' or driving without due consideration for other road users'. Now is the time to include pedestrians and cyclists as road users in the enforcement of that legislation. The registration number of the offending vehicle can be reported to the police and it is then for the driver to give 'good reason' and for the magistrates to determine its authenticity. Cycling organisations and Living Streets might consider putting a test case forward.

However the law is a set of rules laid down clearly by the Westminster parliament or the National Assembly. It is not an option for cyclists to obey or not. If a car is driven along the pavement prosecution follows if caught. As LTCA (LTT 665) commented "Cyclists think there are right never wrong" and many commented in the course of this research (including one of Wales' leading cyclists) said "we only go on pavement because road is dangerous"

'Final mile' and bike hire

Encouraging the use of hired bikes as in London (and as was tried in Cardiff) for the last leg of the journey to / from a railway or bus station. Similarly using bike storage to encourage the use of own bikes or walking at a variety of locations such as schools, hospitals, work places (particularly as part of a private or government funded business park. A key recommendation is to always have sufficient stands to meet demand and to over provide at first. This recommendation is to show potential frequent users that cycling or walking for all or part of the trip (the latter being inter-modal with public transport) will give people confidence that these are safe modes of travel and a journey with a friend or colleague could induce the positive approach and help understanding of other users.

Quality of the cycle lane

While this is not immediately apparent as a behavioural issue, it can cause annoyance and might affect behaviour

Promotional campaigns

There have been marketing campaigns on:

- Road safety
- Bus driver training schemes
- Tolerance
- Respect
- There is now a need to extend these campaigns so both live together (RAC)

Shared space

This is probably the area where behavioural issues occur as it is where the conflicts between different road users interact. There is a need to set down clear rules on exclusive and shared space to reduce or avoid completely this conflict

Predict and provide

There is an opportunity here to predict, provide and promote walking and cycling and to secure more active travel routes. The 'provide' element is investment-led with construction in advance of demand growth thus generating rather than responding to demand. A similar position arises in public transport. The Act is not sufficiently explicit as to whether the journeys referred to are totally by cycle or on foot. There is no provision on the face of the Act the integration into active travel multi-modal travel by public transport – by bus or train for part of the journey. WG is recommended to set down this interpretation.

It has become clear from the evidence that people currently using cars would not be prepared in the first instance to walk over one mile or even cycle that distance. The discussions with transport authorities have also indicated that the objective for active travel is not so much to increase walking and cycling by existing participants but to attract those currently using cars for all or part of the journey. Increasing active travel means an increase in the number taking part not merely an increase in mileage by existing users.

Professor Stuart Cole
Caerdydd / Cardiff
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Discussions

Acknowledgement

The discussions were on a one to one/small group basis and the author is very grateful for the time given by individuals and the use of their experience and expertise in the preparation of this report

Abellio Rail Ltd (2015) discussion with Jeremy Whitaker, Mike Smith

ATB (2015), Active Travel Board, Ministerial advisory board Seminar

Bristol (2015) Discussion with Philip Wright, LSTF Travelwise Engagement Manager, Bristol City Council

CL (2015) Discussion at Capital Law, a Cardiff law firm with Yvette Jaques, Director of operations on *Bike2Go*

Haigh, C (2014) Discussion with Conrad Haigh, Integrated Transport Manager, ATOC, London

Edinburgh (2015) Discussion with Anne Herriman. Site visit Leith walk urban realm creation project delivered by Sustrans and Edinburgh CC, Edinburgh City Council.

Hoe, N (2015), Discussion on Copenhagen cycling infrastructure with Niels Hoe

LTP (2015) Discussion with Jo Sachs – Eldridge, Local Transport Projects on Cardiff City Council active travel plans (referred by Paul Carter, Head of Transport, Cardiff City Council

Metro (2014) A Cardiff capital region Metro, Strategic Implementation Plan v1 Draft. Metro Implementation Team for WG

PJA (2015) Phil Jones Associates, Discussions with Phil Jones

Roberts, C (2014) Discussions (2014 / 2015) with Chris Roberts Special Adviser (including active travel), Cynulliad Cenedlaethol Cymru / National Assembly for Wales, Caerdydd / Cardiff

Sergeant, C (2014) Discussion with Minister with previous responsibility for active travel

Stables, T (2014) Discussion with Tom Stables, Managing Director, Matthew Scoggins, Head of Public Affairs, National Express Coach

Sustrans (2015a) Discussion with John Lauder Director; David Grant Systems Manager Sustrans Scotland, Edinburgh

Sustrans (2015b), Discussions (2014 / 2015) with Jane Lorimer, Director, Sustrans Cymru

Swansea Site Visit (2015) Professor Stuart Cole, Margaret Williams

T Scotland (2015) Discussion with Karen Fury, Tracy McKeon (Sustainable Transport Team), Neil Langhorne – Smarter Choices, Smarter Places programme; overview of policy frameworks, for Scottish Government's investment in active travel, Cycling Action plan for Scotland (CAPS), National walking Strategy (NWS). Overview of services provided by Sustrans on behalf of TS – including information service advice, grant management, support for CAPS, liaison with local authorities. Regional Transport partnerships. Transport Scotland, Edinburgh.

TfL (2015b) Meeting with Professor Cole (Peter Wright, Policy Manager (delivery mechanisms and how TfL work fits into the Mayor's Transport Strategy – focusing on links to work and public services; Kate Barber (behaviour among road users from the customer insight carried out by TfL – see research papers referred to); Lucy Saunders, Mayor's Public Health Adviser, on the health benefits of active travel; Jamie O'Hara, Head of Government Relations, TfL, London

UM (2015) Discussions with John Dales, Urban Movement. London

Van de Wijk, W (2014), Discussion on the Netherlands experience with Win van der Wijk

WG (2015) Discussions with Meryl James, Claire Bennett (Deputy Director). Natalie Grohmann, (2014, 2015) Llywodraeth Cymru / Welsh Government, Caerdydd / Cardiff

WLA (2014), Bridgend CBC Discussion with Kwaku Opoku – Addo, Matthew Gilbert, Kevin Sales.

WLA (2014), Caerphilly CBC Discussion with Huw Morgan, Gemma Thomas.

WLA (2014), Powys Paper response on active travel structured questionnaire – Anthea Jones

WLA (2014c), Denbighshire, Discussion with Peter Daniels, Ben Wilcox-Jones, Mike Jones

WLA (2015) Swansea Discussion at City and County of Swansea – Stuart Davies, Ben George, Sue Miles