THE MOVEMENT STRATEGY FOR BATH

Technical Appendix C

Document history

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Technical Appendix C: The Levers of the Movement Strategy

We have used different sources of evidence to identify and test measures ('levers') to support the Movement Strategy. Our starting point was to use a tool called the Carbon Assessment Playbook[1], which has recently been developed to help develop transport policies to support mode shift and reduce greenhouse gas emissions. This shows that a wide range of policies is needed to achieve changes in travel behaviours.

The Playbook applies the 'Avoid-Shift-Improve' methodology to identify potential policies. This includes measures to avoid or reduce the need to travel, and measures to enable people shift to active travel or public transport. These measures are important in reducing traffic demand, which is the root cause of greenhouse gas emissions. The third component ('improve') focuses on reducing emissions from vehicles, including measures such as Electric Vehicle (EV) charging, EV car clubs and zero emissions bus fleets. All of these levers will be needed to successfully reduce emissions.

We will continue in our programmes to accelerate the uptake of zero emissions vehicles across B&NES. However, our primary focus in this Movement Strategy is to create great quality places, improve travel choices and reduce vehicular traffic volumes. The evidence from the Playbook indicates that the following transport measures would be likely to be most effective in supporting our goals:

- Business travel plans: by working closely with businesses, we have the opportunity to reduce car dependency for commuting and business journeys.
- Road user charging: through application of area-wide road charging, we can influence people's travel choices and encourage more people to consider other modes.
- Providing new public transport options: if well-designed, these can significantly improve travel options, for example through new rapid transit services.
- Promoting more car sharing: where there are groups of people travelling to the same destination, for example hospitals, universities and large employers.
- Better management of on-street parking: many people currently drive because they know that there is plentiful parking at their destination.

These measures would have the greatest impacts because they influence a wide range of journeys, including longer journeys that generate more greenhouse gases. In practice, the real-world impacts of these measures depend on the numbers of people that are influenced. This means that it is more important to influence the travel behaviours of a large number of people than concentrate on improving travel choices on one single corridor with a limited catchment area.

These levers have the technical backing to be effective in helping us achieve the goals of the Movement Strategy. They are grounded in evidence and modelling, and offer a flexible toolkit for change. It is ultimately up to us—whether as a local authority, stakeholders, or communities—to decide how far we want to 'pull' on each lever, depending on our ambitions and priorities. Further testing and detailed modelling of the proposals will be required to understand their specific impacts and to refine the approach as we move forward.

The following pages present the levers to support the Movement Strategy

[1] Carbon Assessment Playbook

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Create great quality places

Safer traffic speeds across the city

Table C1 – Safer traffic speeds across the city

Description	Introduce 20mph speed restrictions where appropriate to improve the environment for walking, wheeling and cycling. May include other traffic calming measures such as narrower traffic lanes. Pedestrian friendly features such as wide footways and dedicated cycle lanes. May form part of a wider low traffic residential street improvement which involves multiple roads with speed restrictions. Better enforcement of speed limits.
Purpose	Increase safety and improve environment for walking, wheeling and cycling.
Current Challenges	There is a heavy reliance on car travel within B&NES, causing highway delays, congestion, traffic safety and air quality challenges, and increased carbon emissions. Reducing speeds helps to reduce some of the issues associated with car travel.
Strategy goal	Create great quality places.
Complements	Residential Street Improvements
Benefits	▪ Public health, safety and wellbeing: enable healthy travel choices and safer places by design. ▪ Environment and climate change: decarbonise our transport systems and reduce the negative impacts of traffic and congestion.
Case Studies	The Department for Transport: 20mph Research Study by Atkins, AECOM and Professor Mike Maher (UCL) assesses the outcomes of introducing 20 mph speed limit schemes in residential areas and town centres. These are generally on a wider scale, but “signs only”, i.e. without the traffic calming measures of earlier 20mph zones. They were introduced for a variety of transport, community and health reasons. The study finds: ▪ Public support for 20mph (signed only) limits but concern about non-compliance. ▪ Minor changes in driven speeds: median speed fell 0.7mph in residential areas and 0.9mph in city centre areas.

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	▪ Faster drivers reduced speed more: 1.1mph and 1.6mph respectively (85th %ile). ▪ Road characteristics have a much larger impact on driven speeds than whether the road has a 30mph or 20mph limit. ▪ No significant change in short term in collisions and casualties in the majority of case studies. ▪ The majority of people have not noticed a reduction in the speed of vehicles, and do not perceive there to be fewer vehicles driving at excessive speeds.

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Public realm improvements

Table C2 – Public realm improvements

Description	The focus is on enhancing our sense of community, health and well-being through the introduction of attractive seating, places to meet, play areas, cycle storage, tree planting and wild-flower areas, which may be achieved by rebalancing our street spaces. This approach will be taken in our historic city centre, protecting Bath's status as a World Heritage City, and within our local neighbourhoods. This will include: ▪ Rebalance the movement hierarchy giving priority to pedestrians, cyclists and public transport. ▪ Refashion the public realm creating a lattice of connected streets and spaces and utilising high-quality materials, bespoke furniture and exceptional landscape and lighting design. ▪ Reveal the city through the introduction of a new multi-channel information and wayfinding system for all modes of movement. ▪ Reanimate the city centre through an imaginative and pioneering programme of public art, events and activities. ▪ Reduce traffic and reclaim places where people can enjoy, interact and spend time in – for example Queen Square. ▪ Build on green infrastructure projects that are already ongoing in Bath.
Purpose	Create great quality places that enhance the quality of life of residents by promoting well-being, connectivity and inclusive environments.
Current Challenges	Many streets within B&NES are perceived to have safety issues, including high numbers of heavy vehicles. Air Quality Management Areas (AQMAs) continue to be in place within the city as nitrogen dioxide concentrations fluctuate above and below legal limits throughout a typical year4. Furthermore, the quality of the public realm is compromised by severance and noise caused by motorised traffic, particularly on the A roads within Bath where noise is typically above acceptable levels of 75 dB[2].
Strategy goal	Create great quality places.
Complements	Improving Residential Streets
Benefits	▪ Inclusive economy: support our economy, enabling shared prosperity. ▪ Public health, safety and wellbeing: enable healthy travel choices and safer places by design.
Case Studies	Sheffield, UK: improved public spaces and narrowing of carriageways to give pedestrians more space resulted in a 35% increase in city centre footfall, £4.2m increase in visitor spending and increased rental values.

[2] Extrium > England Noise and Air Quality Viewer

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Chepstow UK[3]: an economic healthcheck in 2000 revealed a town in danger of decline. The poor physical environment in the town centre exacerbated by traffic congestion was identified as a contributory factor. The £2.4 million Chepstow High Street Regeneration Scheme delivered a dramatic improvement to the pedestrian environment of the town centre by:

- Alleviating traffic problems in the High Street by introducing a Restricted Parking Zone, with a projected reduction in through traffic.
- Improving the pedestrian experience by widening pavements and creating safe and accessible spaces.
- Enhancing the quality of the public realm through high quality paving materials and public art that reinforced the town's history and identity.
- Improving the setting of keynote buildings and the primary shopping area which helped to encourage re-investment and new activity.

The project itself has been an undoubted success, receiving major recognition as a winner of prestigious awards. A survey conducted two years after the completion of the scheme highlighted:

- A significant drop in retail vacancy rates from 14% to 5.7% (2006).
- A net gain and protection of 77 jobs amongst the surveyed businesses.
- A positive response from surveyed visitors, with 88% confirming they would recommend Chepstow as destination to friends and family

[3] Appendix 3 stroud_public_realm_strategy.pdf

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Residential Street Improvements

Table C3 – Residential Street Improvements

Description	Create residential areas that are accessible and open to vehicles for residents, deliveries and emergency vehicles and people who walk, wheel and cycle but not for through traffic. Restriction of through-traffic creates safer and more pleasant places for people to live and allows more space for active travel and public realm improvements. Features include: ▪ Accessible for people with disabilities. ▪ Reduced movement of through traffic. ▪ Traffic calming measures. ▪ Improved walking, cycling and wheeling facilities such as cycle lane and improved crossing points. ▪ Increased sense of safety. ▪ Space for community assets such as trees, benches and artwork. ▪ Increased green space. ▪ Better active travel access to facilities and amenities such as education and healthcare. ▪ Improved wayfinding.
Purpose	Create great quality places/streets that enhance the quality of life of residents by promoting well-being, connectivity and inclusive environments.
Current Challenges	Analysis of internal trips within Bath shows 48% are carried out by walking but car trips were still 39% despite the short distance of these trips. It is considered that residential street improvements can help encourage mode shift to more active modes for shorter journeys by making active travel more attractive, safer and easier whilst making car journeys less attractive by slowing vehicles down and restricting access to through traffic.
Strategy goal	Create better places.
Complements	Public space improvements
Benefits	▪ Inclusive economy: support our economy, enabling shared prosperity. ▪ Public health, safety and wellbeing: enable healthy travel choices and safer places by design. ▪ Accessibility: maximise access to all modes, reducing inequality and improving fairness across the transport network.
Case Study	Exeter, UK: removal of vehicle traffic, traffic management and increase in pedestrian and shared spaces in the city centre resulted in a 20% increase in footfall and increase in retail rent prices of £5 per square foot.

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Improve travel choices

Bus priority measures

Table C4 – Bus priority measures

Description	Infrastructure development designed to enhance efficiency, reliability and speed of bus services. This could include: ▪ Dedicated bus lanes. ▪ Traffic signal priority. ▪ Bus lanes. ▪ Bus gates. ▪ Boarding and alighting improvements. ▪ Bus stop optimisation. ▪ Real time information systems. ▪ Adhering to LTN1/24 guidance.
Purpose	Improve bus services within Bath to enable more people to make a realistic and informed choice to use public transport. Combined with this, we will lobby for services, reduced fares and increased frequency of services.
Current Challenges	Analysis of internal trips by each mode shows a reliance on car trips (39%), despite the short distance of these trips. Walking accounts for 48% of trips, 4% by cycling, and 10% by public transport. Introducing bus priority measures will help to improve the attractiveness and reliability of public transport.
Strategy goal	Improve travel choices.
Complements	Making the most of our interchanges and creating mobility hubs.
Benefits	▪ Accessibility: Maximise access to all modes, reducing inequality and improving fairness across the transport network. ▪ Public health, safety and wellbeing: Enable healthy travel choices and safer places by design ▪ Environment and climate change: Decarbonise our transport systems and reduce the negative impacts of traffic and congestion. ▪ Sustainability and place: Connect people to jobs, education and services through high quality sustainable travel.
Case Study	Gateshead, UK: Bus lanes were installed at various locations across Gateshead, mainly within the town centre and on key travel corridors into the centre. A post-implementation review was undertaken at a number of locations, with the findings highlighting the substantially positive impact that bus lanes can have on journey times. In the case of the A692 at Lobley Hill Road, the introduction of the bus lane

necessitated the loss of a lane for general traffic, resulting in a 14% decrease in weekday traffic.

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Deliver our active travel masterplan across the city

Table C5 – Deliver our active travel masterplan across the city

Description	Delivering the active travel masterplan will include the following measures: ▪ LTN 1/20 standard cycle facilities. ▪ Physical segregation between cyclists and pedestrians and vehicles. ▪ Priority crossings for cyclists and pedestrians at junctions. ▪ Accessible for people with disabilities. ▪ Appropriate surfaces for all weathers. ▪ Good wayfinding on routes including distance markers. ▪ Increase feeling of safety on routes. ▪ Attractive routes with planting and lighting. ▪ Support the use and access to e-bikes and e-cargo bikes.
Purpose	Provide active travel options that are an attractive alternative to the private car.
Current Challenges	Trips within Bath (with an origin and destination within the city) comprise 36% of total movements. 2011 Census data show that walking to work in Bath is most popular in the city centre (38%-55% of commuters walk to work) and decreases with distance from the city centre (10%-18% of commuters living outside of the city centre walk to work). Cycling to work is more popular in areas of the city with more shallow topography (9%-15% of commuters cycle to work) and in areas of green space. This is a greater modal share than in most of the city (overall 1-6% of commuters cycling to work). 2021 Census data shows that 17% of Bath residents walk to work (greater than the national average of 8%), and 2.6% of Bath residents cycle to work (greater than the national average of 2.1%). These proportions have decreased from the 2011 Census; however, this data is heavily caveated due to the COVID-19 pandemic. This shows that more can be done to encourage walking and cycling for internal trips within Bath.
Strategy goal	Improve travel choices.
Complements	Residential Street Improvements
Benefits	▪ Accessibility: maximise access to all modes, reducing inequality and improving fairness access the transport network. ▪ Public health, safety and wellbeing: enable healthy travel choices and safer places by design ▪ Environment and climate change: decarbonise our transport systems and reduce the negative impacts of traffic and congestion. ▪ Sustainability and place: connect people to jobs, education and services through high quality sustainable travel.
Case Studies	Nine in ten Business Improvement Districts say that walking and cycling creates vibrant areas and 83% say it attracts more customers (Aldred and Sharkey, 2017).

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After a Canadian council reallocated high street parking as bike lanes or cycle parking for a year, businesses benefited from increased footfall (20% increase), spend (16% increase) and increased frequency of return visits (13% increase).

UK: three cities that implemented motor-free walking and cycling routes found that after 2 years people that lived near the routes were getting more physical activity (Goodman et al, 2014).

The Hague, Netherlands: Created a circulation plan to reallocate space from traffic to walking and cycling. Economic indicators show better results than comparative cities (Tiemens and Molenaar, 2014).

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Reduce vehicular traffic volumes

Making the most of our interchanges and creating mobility hubs

Table C6 - Making the most of our interchanges and creating mobility hubs

Description	Interchanges, which offer more options than traditional park and ride facilities, and mobility hubs would involve the following improvements: ▪ Maintain high frequency services with direct/short journey time into the centre. ▪ Existing interchange sites (Odd Down, Newbridge, Lansdowne): ▪ High quality waiting infrastructure. ▪ Lighting & safety. ▪ Facilities – toilets. ▪ Parcel points. ▪ Freight hub. ▪ Additional capacity. ▪ Information & incentives: ▪ Clear signage strategy (see signage strategy). ▪ Tourist benefits/offers. ▪ Link & ride – mobility hubs on key bus routes into the city. ▪ 'New' potential hubs.
Purpose	Intercept traffic on the edge of the city which would otherwise travel into the centre. Intercept journeys to allow people to leave their cars closer to home. Reduce need for goods vehicles servicing the city to travel into the centre. Link public transport with active travel infrastructure. Increase patronage of public transport and ensuring routes are financially viable to enable greater accessibility by public transport.
Current Challenges	40% of total movements in Bath are those coming to the city from outside Bath. Of these total movements, 53% is by car. There is potential for these trips to be intercepted by interchanges and converted to other modes of transport.

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	Prior to the pandemic, average Park & Ride bus ridership was stable throughout most of 2019 with around 5,000 daily passengers. Park & Ride ridership is yet to return to pre-pandemic levels, with the average ridership in 2022 at 4,000 daily passengers[4]. Feedback from visitors to Bath suggested that one of the main issues for tourists is that the park and ride services do not run late enough particularly on a weekend.
Strategy goal	Reduce vehicular traffic volumes.
Complements	Residential Street Improvements, Bus priority measures.
Benefits	▪ Environment and climate change: decarbonise our transport systems, and reduce the negative impacts of traffic and congestion ▪ Sustainability and place: connect people to jobs, education and services through high quality sustainable travel. ▪ Public health, safety and wellbeing: enable healthy travel choices and safer places by design.
Case studies	Wessex Water employs over 2,000 people, with up to 400 people going to work each day at the Operations Centre at Claverton Down. The company promotes sustainable travel to its site by operating a free bus service every 20 minutes from Bath city centre. The buses are equipped with bike storage, and on-site there are showers and changing facilities for people who walk and cycle. There is an average of 155 trips per day on the buses, taking up to 80 cars off the road each day.

[4] Bath's Clean Air Zone Summary 2022 (bathnes.gov.uk)

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Managing car parking in the city more effectively

Table C7 – Making car parking in the city more efficient

Description	Managing car parking through a series of measures, including: ▪ Pricing of car parking. ▪ Managing the supply of car parking. ▪ Improving direction signage to most appropriate car parks within the city centre. ▪ Reducing on-street parking. ▪ Imposing a pavement parking ban. ▪ Residents parking zones. ▪ Investigate workplace parking levy.
Purpose	Reduce traffic volumes in the centre. Improve conditions for walking, wheeling and cycling. Generate income to support travel options. Reduce delays for buses.
Current Challenges	The total number of parking spaces in Bath is estimated to be approximately 18,700. This includes private non-residential parking, residential parking, B&NES-operated car parks and some B&NES on-street parking (due to the definition of parking polygons in OpenStreetMap). This is an early estimate, and full surveys are recommended as part of the next stage of work. On a typical weekday, two thirds of journeys on the city's transport network are by car. Of this it is estimated that 22% are journeys within the city, 48% to/from the city and 30% travel through the city. This equates to approximately 135,000 car journeys in the city on a typical day, needing somewhere to park at the start and end of their journey – whether on-street, dedicated off-street car parks, or at home. The availability of car parking is recognised as a factor in car journeys, managing it effectively can manage car demand. Managing on-street parking and illegal pavement parking can also improve the environment and safety for walking, wheeling and cyclists. It can also free up the street space for other activities and improve the environment and places in the city. Large off-street parking occupies parts of land that could be repurposed for other purposes. Feedback from tourists visiting Bath suggested that there is a lack of transparent payment information for car parks online and a lack of close disabled parking to the centre and main attractions.
Strategy goal	Reduce vehicular traffic volumes.

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Complements	Coach and Visitors Making the most of our interchange and mobility hubs
Benefits	▪ Environment and climate change: decarbonise our transport systems and reduce the negative impacts of traffic and congestion. ▪ Resilience: deliver an adaptive and climate resilient transport system, withstanding extreme heat and flooding.
Case studies	Newcastle UK: Acorn Road scheme reallocated road space to active modes and removed 20 car parking spaces, which initially concerned retailers (Sustrans, 2017). But out of 500 people, 77% agreed that it has become a thriving retail area after the scheme was implemented (Clarkson, 2018). Oslo, Norway: A study in Markveien found that customers choose to shop in the area for atmospheric and instrumental factors, never for parking accessibility and as such, many retailers have chosen to reallocate parking spaces to pedestrians and cyclists, which has boosted business vitality (Kaurstad, 2016). Reallocating the space used for car parking to other purposes can also improve the shopping environment to increase the local economy: San Francisco: 37% increase in pedestrian traffic (weekday) and 370% increase at weekends (Global Designing Initiative, 2015). New York: 170% increase in retail sales as a result of turning parking spaces into parklets (Sadik-Khan, 2013). London: 20% increase in retail sales in shops adjacent to parklets (Hackney Council, 2017).

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Coach travel

Table C8 – Coach travel

Description	Managing coaches within the city centre including where they drop-off and pick up and park will be undertaken through a coach parking strategy that will need to be developed in the future. This will help provide direction for coaches to ensure coach journeys are still an attractive way for visitors to travel to Bath.
Purpose	Plan where coach parking and pick up/drop off occurs to ensure it is not adding to traffic issues and creating an unattractive environment.
Current Challenges	City centre coach traffic is extremely heavy, and demand for waiting space is very high (particularly in the summer months), coach parking needs to be managed, allowing for safe drop-off and pick-up of passengers with minimum disruption. Currently coaches can pick up/drop-off in city centre in specified bays for a specified amount of time however they are then directed to Odd Down Coach Park which provides 29 coach bays. This is unattractive to coach drivers as although there are facilities such as toilets, water etc there are no coffee shops or other amenities such as what is available in the city centre. Challenges stem from the closure of the former city centre coach park. Coaches are far more efficient at bringing people to Bath than cars but car parking has been given priority, partly due to the higher direct income generated. Shopmobility and accessible experiences were identified as common complaints for visitors to Bath. For many attractions some or all of the experience is out of bounds for those reliant on wheelchairs, or for those with limited mobility the physical experience of getting to the location and then the lack of access is too much.
Strategy goal	Reduce vehicular traffic volume.
Complements	Managing car park more effectively.
Benefits	▪ Environment and climate change: decarbonise our transport systems and reduce the negative impacts of traffic and congestion. ▪ Resilience: deliver an adaptive and climate resilient transport system, withstanding extreme heat and flooding. ▪ Accessibility: maximise access to all modes, reducing inequality and improving fairness across the transport network.
Case studies	London UK: TFL developed a ‘Tourist Coach Action Plan’ in 2013 that outlined measures such as designated coach parking zones. This successfully helped control movement of coaches in London. Edinburgh, UK: Edinburgh Council is developing an Operational Management Plan to outline the role of coaches and tour buses and other functions and have set up a coach and tour bus stakeholder group to engage with in its development from 2022.

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Signage and information

Table C9 – Signage and information

Description	Create a signage strategy that helps guide the flow of traffic and enhances safety.
Purpose	Redirect through traffic to the designated routes allowing for better flow of traffic and less congestion in the city centre. Also used to intercept traffic coming into the city to direct to interchange points and to direct to the nearest car park.
Current Challenges	28,000 commuters travelled into Bath, with 75% of those who drive to work in the city doing so from outside of the city boundary. Car usage for those travelling in from outside of Bath was 53%. There is limited east-west traffic through Bath, which is due to the availability of alternative routes e.g. A420 Chippenham to East Bristol to the north of Bath, and the route from Newton St Loe to Midford to the south of the city. However, there are limited alternatives to the A36 and A46 for north-south traffic to bypass the city. The M4 to Dorset Coast Connectivity Study highlights that the A36 through Bath is a key route between the Dorset Coast and the M4. Signage will help guide this through-traffic through a designated route to help control the flow of traffic.
Strategy goal	Reduce vehicular traffic volumes. Create better places.
Complements	Managing car park more effectively. Coach parking.
Benefits	▪ Accessibility: maximise access to all modes, reducing inequality and improving fairness across the transport network. ▪ Sustainability and place: connect people to jobs, education and services through high quality sustainable travel.
Case Studies	UK: In 2013, the Road Safety Foundation in the UK published a report entitled 'Measuring to manage: 'Tracking the Safety of Britain's major road network. Taking the period 2002-2006 and '2007-2011' as a reference, the report published the results of a before-after analysis of certain road sections which had shown the largest safety improvements during these two periods. The analysis demonstrated that traffic signs, either in the form of an improvement of existing signage or the installation of new signs, was one of the contributing factors in a 7 out of 10 road stretches examined, which led to overall impressive decreases in fatalities of up to 87%.[5]

[5] ERF_Position_Paper_on_Vertical_Signage_Final_7.pdf

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Management of freight movements

Table C10 - Management of freight movements

Description	Through-traffic and freight will be managed in several ways: Freight consolidation centres at interchanges or other locations on the edge of the city. Freight travelling through the city will be encouraged to use M4 if travelling East-West or along the A350 for North South movements Managed in collaboration with West of England Mayoral Combined Authority & National Highways.
Purpose	Reduce the volume of traffic and number of large vehicles travelling into Bath.
Current Challenges	Analysis of DfT Traffic Count data shows that HGVs typically make up ~3% of the vehicular traffic within Bath.
Strategy goal	Reduce vehicular traffic volumes.
Complements	Reduce traffic
Benefits	▪ Environment and climate change: decarbonise our transport systems and reduce the negative impacts of traffic and congestion. ▪ Resilience: deliver an adaptive and climate resilient transport system, withstanding extreme heat and flooding.
Case Studies	Bristol, UK: Bristol Freight Consolidation Centre was initially set up as a pilot scheme in 2004 with European funding to help alleviate issues associated with freight in Broadmead, Bristol. It was then known as Broadmead Freight Consolidation Scheme and was the first project of its kind in the UK. Bristol was one of a handful of European cities to have a consolidation centre and was seen as an example of best practice throughout Europe. The freight consolidation centre was operated by DHL under various contracts procured by Bristol City Council until 2018. It initially operated from Emersons Green, and from 2007 the Freight Consolidation Centre moved to Avonmouth on the outskirts of Bristol. Using the freight consolidation scheme was voluntary with approximately 150 businesses (Bristol and Bath) using the scheme at its peak and dealt with non-perishable items only. At its peak, a 70% to 80% reduction in the number of onward trips was seen by the freight consolidation scheme. This meant that for every 10 vehicles that made a delivery to the consolidation centre, just 2 or 3 onward journeys to the central Bristol area were made.

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Demand management such as Workplace Parking Levy and Clean Air Zone

Table C11 – Demand management such as Workplace Parking Levy and Clean Air Zone

Description	Reduce traffic by deterring vehicles from driving into the city centre. Several demand management measures that could be introduced individually or in combination. A Workplace Parking Levy is a charge on employers and education organisations for the number of parking places they provide that are regularly used by employees, students or others. Clean Air Zone: Bath introduced a CAZ in 2021; consideration could be given to expanding aspects of the CAZ, which could be by area or by the types of vehicles that are charged, to further improve air quality in the area. Other demand management measures that can be introduced include, but are not limited to: ▪ Car sharing. ▪ Public transport discounts or ticketing incentives. ▪ Congestion charging or road user charging. ▪ Adjustments to parking charges and the number of council-run city centre car park spaces. ▪ Traffic signal improvements. ▪ Enhanced VMS to car parks (short and long stay). ▪ Staggered start times for business and places of education. ▪ Review business travel planning that could reduce vehicle journeys. ▪ Establishment of Local Hub Networks to encourage shorter journeys that could be undertaken by sustainable modes. ▪ Extension of Residents Parking Zones, where requested by residents.
Purpose	Reduce the number of vehicles driving into Bath city centre. Reduce the attractiveness of the private car.
Current Challenges	28,000 commuters travelled into Bath, with 75% of those who drive to work in the city doing so from outside of the city boundary. Car usage for those travelling in from outside of Bath was 53%. There is a heavy reliance on car travel within B&NES, causing highway delays, congestion, traffic safety and air quality challenges, and increased carbon emissions due to cars emitting the most carbon of all forms of personal transport per gram per km.
Strategy goal	Reduce vehicular traffic volumes.
Complements	Managing car parking in the city centre.
Benefits	▪ Environment and climate change: decarbonise our transport systems and reduce the negative impacts of traffic and congestion.

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	▪ Resilience: deliver an adaptive and climate resilient transport system, withstanding extreme heat and flooding.
Case Studies	Nottingham, UK: In 2012, Nottingham took the unprecedented step to introduce a Workplace Parking Levy (WPL). Covering the whole City Council administrative area, the levy was the first of its kind in Europe. In the 1990's, congestion had been forecast to grow by 15% by 2021. The WPL has successfully reduced congestion growth by 47%.

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Testing the Levers

Purpose of the testing

Modelling was undertaken using the West of England Regional Transport Model (WERTM, 2019) to understand the level of change required in order to achieve the vision for the Movement Strategy.

Through this approach, we built a detailed understanding of the roles of different measures in delivering modal shift, and how these could be choreographed to support the objectives of the Movement Strategy. We also developed an understanding of the limitations of what can be achieved in practice, and essential conditions that will need to be in place to support reallocation of road space across the city.

What have we tested

Several factors were tested in different scenarios. The factors that were tested were:

- Active travel (walking, wheeling and cycling) only (20% reduction in perceived walk/wheel/cycle time).
- Bus (50% cheaper fares across whole region, doubling frequency, 20% reduction in perceived waiting time at bus stops).
- Parking (costs increased by 50%, Bath & Bristol).
- Extend parking management areas (Residential Parking Zones, potentially WPL).

These factors were tested in different scenarios:

- Test 1: apply all of the above components to forecast potential changes in demand in the city. This is the full 'Do Maximum', which applies the full range of policy levers for mode shift.
- Test 2: focus on policies i.e. parking and demand management. This will help to understand the relative importance of demand management in 'shifting the dial' in modal shift across the city.
- Test 3: add the active travel component to examine how improving conditions for walking and cycling would complement demand management measures.

What the testing tells us

The results from the testing are provided in for the 'test 1' scenario. Table C12 shows the increase in several metrics between the 2019 and 2029 'Do Minimum' (without the strategy) scenarios in comparison with the impact of the Movement Strategy if the proposed measures were put in place.

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Table C12 – Results of testing the strategy

Metric (within B&NES area)	**If we do nothing, what would happen up to 2029** **(from a 2019 base)?**	**If we implemented the Movement Strategy, what would happen…**	
		…in 2029 compared to doing nothing	…compared to the 2019 base year, if we do nothing
Population	7% increase	No change	7% increase
Total daily car trips	7% increase	11% decrease	5% decrease
Total daily distance travelled by car	13% increase	8% decrease	4% increase
Car trips per person, per day	No change	11% decrease	11% decrease
Daily average distance per person, by car	6% increase	8% decrease	3% decrease

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Without the strategy ('Do Minimum')

The column headed *'If we do nothing, what would happen up to 2029 (from a 2019 base)?*' shows the key statistics for the B&NES area, comparing the 2029 Do Minimum against the 2019 base – i.e. what we could expect in the absence of any action. This shows that car trips will rise in line with population, and total distances travelled will increase by more than this. This is because people will be travelling further for day-to-day activities.

With the Movement Strategy

The column headed '*If we implemented the Movement Strategy, what would happen…in 2029 compared to doing nothing'* shows the impacts of the Movement Strategy vs the Do Minimum. This is showing that it will have a positive impact. If all the measures were introduced, there could be potential to reduce car trips by 11% in the B&NES area compared with the Do Minimum.

The total distance travelled would reduce by 8%, slightly less than the reduction in the number of trips. This is because the policy levers are most focused on trips within and into the city. The modelling does not include interventions to reduce car trips through the city, so these longer-distance trips have not been impacted. This shows that, in future, actions to reduce the longer-distance trips, through better rail options, will be needed.

The column headed '*If we implemented the Movement Strategy, what would happen… compared to the 2019 base year, if we do nothing*' shows the impacts of the Movement Strategy against the 2019 base. The total impact is the combination of the underlying growth from 2019 to 2029, and then the effects of the Movement Strategy in encouraging mode shift. The Movement Strategy is forecast to deliver a 5% reduction in trips compared with the 2019 base, but the overall distance travelled would still increase by 4% from 2019. However, this would be substantially less than the 13% increase in the Do Minimum.