DURHAM

LOCAL PLAN

TRAFFIC IMPACT

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JACOBS

Durham Local Plan Traffic Impact

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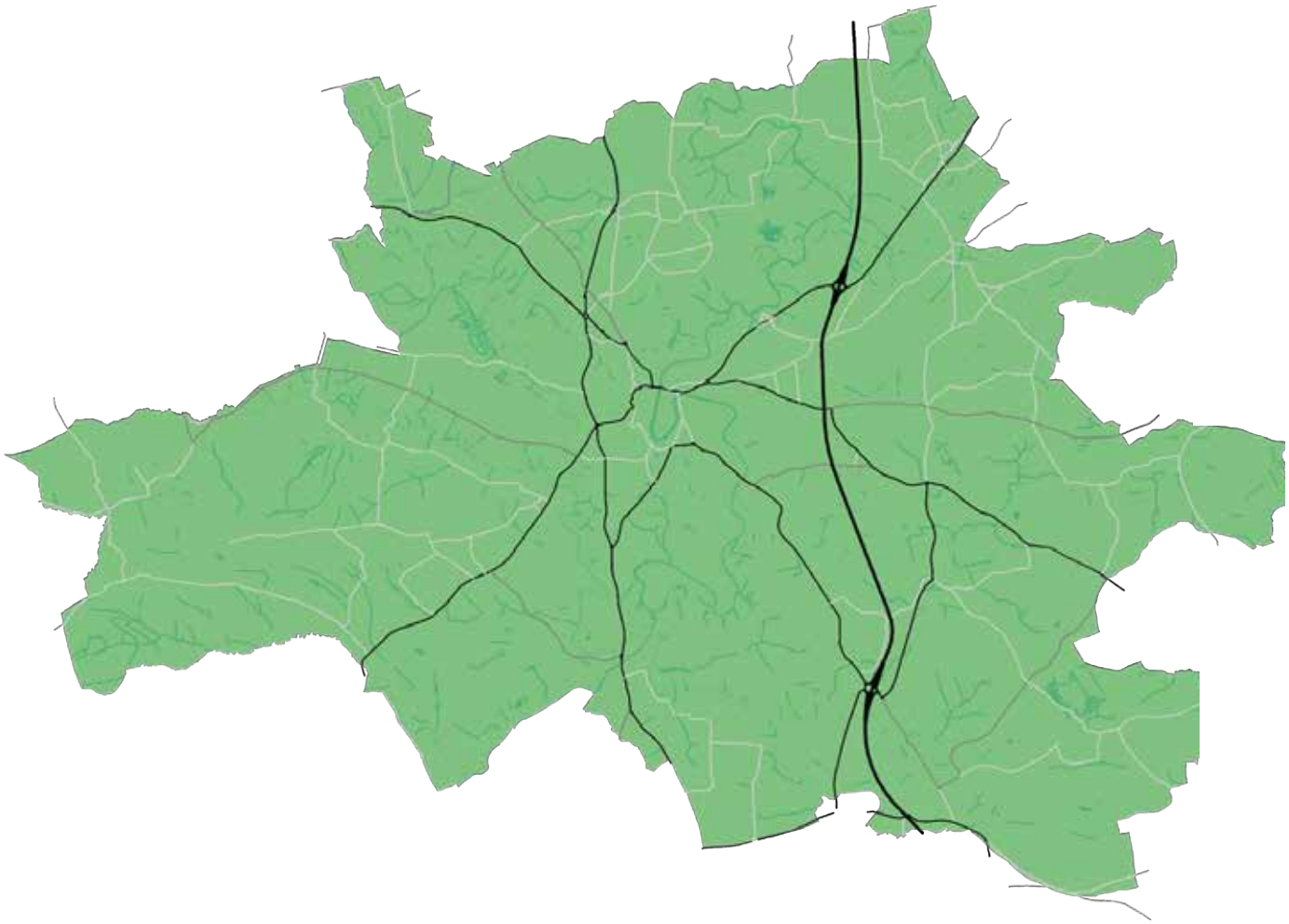
1. INTRODUCTION

The County Durham Plan will seek to meet the housing needs of residents and will aim to support economic growth through employment land allocations across the county. Transport infrastructure has a key role in this respect. It is widely accepted that there is a direct link between the productivity of a city or region and the performance of its internal and external transport infrastructure linkages. This study therefore considers the impacts of predicted housing and employment growth in County Durham on the operation of the local road network in the future.



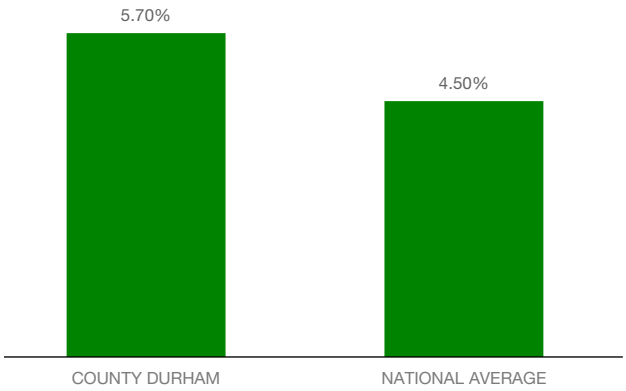
1.1 ECONOMIC CONTEXT

Current evidence suggests that County Durham is underperforming economically. The unemployment rate in County Durham is 5.7%, higher than the national rate of 4.5% (March 2017 figures). When considering Gross Value Added (GVA) per person in County Durham, this stood at £16,513 in 2016 and is significantly lower than the figures for the North East (£19,542) and UK (£26,320).

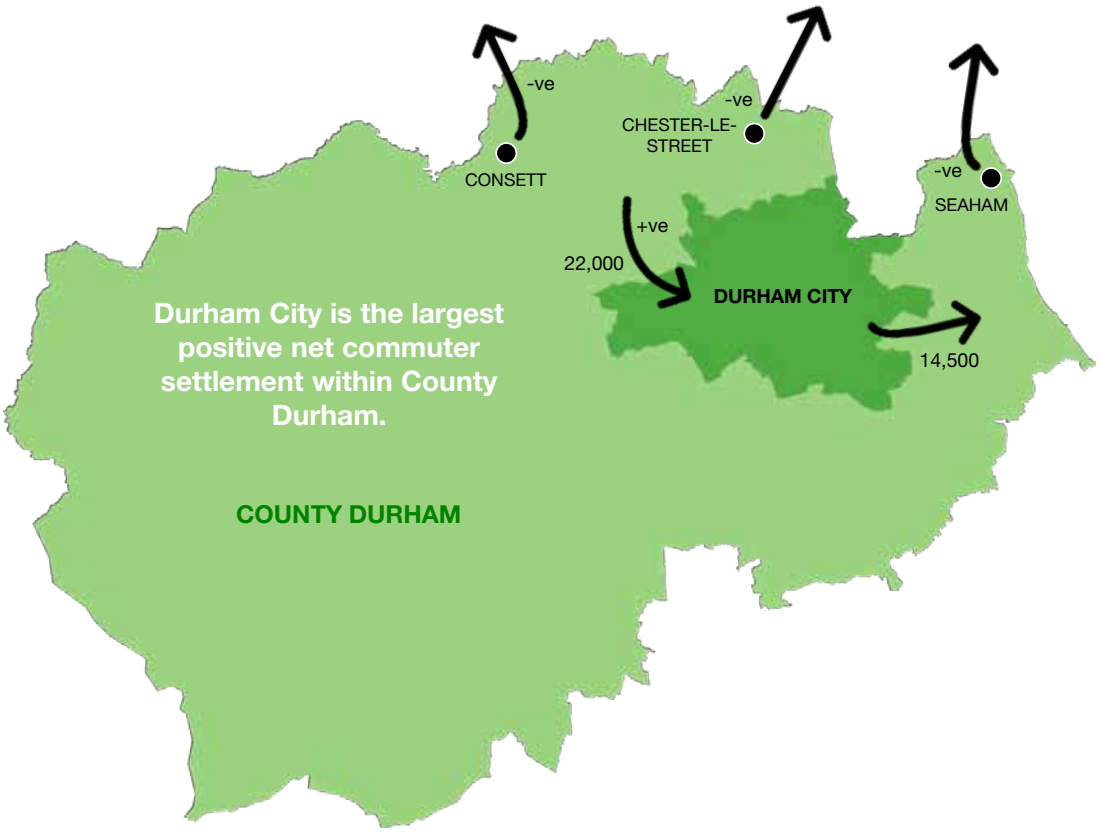
Durham City is the county's largest employment centre with 33,940 people working in the city. Newton Aycliffe and Peterlee are the next highest employment centres in County Durham, which are located near major transport corridors and they also have positive net in commuting statistics. Alongside Durham City, settlements such as Peterlee, Newton Aycliffe, Consett, Chester-le-Street and Bishop Auckland will all have a role to play in generating employment for the county.

Indeed, not only is Durham City the key employment centre within the county, it is also a major commuter destination for cross boundary journeys with 25% of all commuting journeys from neighbouring local authorities into the county destined for the city.

A clear relationship between the location of employment and commuting patterns exists within the county. Over 36,000 inward commuting journeys to Durham City are made every day, while the number of outward commuting journeys is under 14,500, representing a positive net commuting figure for the city of nearly 22,000. The only employment centre across the region with more inward commuting journeys is Newcastle with 88,000 journeys per day. This demonstrates that Durham City is a major attractor of economically active people within the county, and is also of importance in relation to the wider north.



UNEMPLOYMENT



Cross-boundary, work-related journeys from County Durham to neighbouring local authorities represent a leakage of productivity outside of the county. As evidenced by existing Census working patterns, provision of housing development in settlements located on the periphery of the county could result in a higher number of cross-boundary journeys as these areas have a strong links with neighbouring authorities. These commuting patterns highlight that the location of housing and employment development plays an important role in the economic performance of the city and wider county.

1.2 ACHIEVING HOUSING GROWTH

In recent years, ever increasing population within the UK has set the tone for central government to emphasise the importance of providing new homes in the right places within local authority areas. The Local Plan process aims to bring increased certainty to housing and employment growth in line with national needs and employment land allocations, appropriate for the county in accordance with their employment land review.

Not only is it imperative that County Durham strives to achieve its targets for housing growth, but it must do so in a way that maximises the ancillary benefits of this increased housing and population. It is generally accepted in housing market economics that the most optimum scenario for productivity gain is to balance labour force and jobs across an area. Locating housing in the largest settlements with the most employment opportunities would continue, and promote, trends of labour force productivity capture within the county, as well as encourage inward investment from employers.

1.3 IMPROVING AIR QUALITY

The Durham City Sustainable Transport Delivery Plan 2019-2035 (SYSTRA, 2019) cites the EU's European Environment Agency's statement that pollution is now the single largest environmental health risk in Europe, responsible for more than 430,000 premature deaths. Furthermore, the World Health Organisation has issued new warnings about deadly levels of pollution in many of the world's biggest cities, including the influence of traffic emissions.

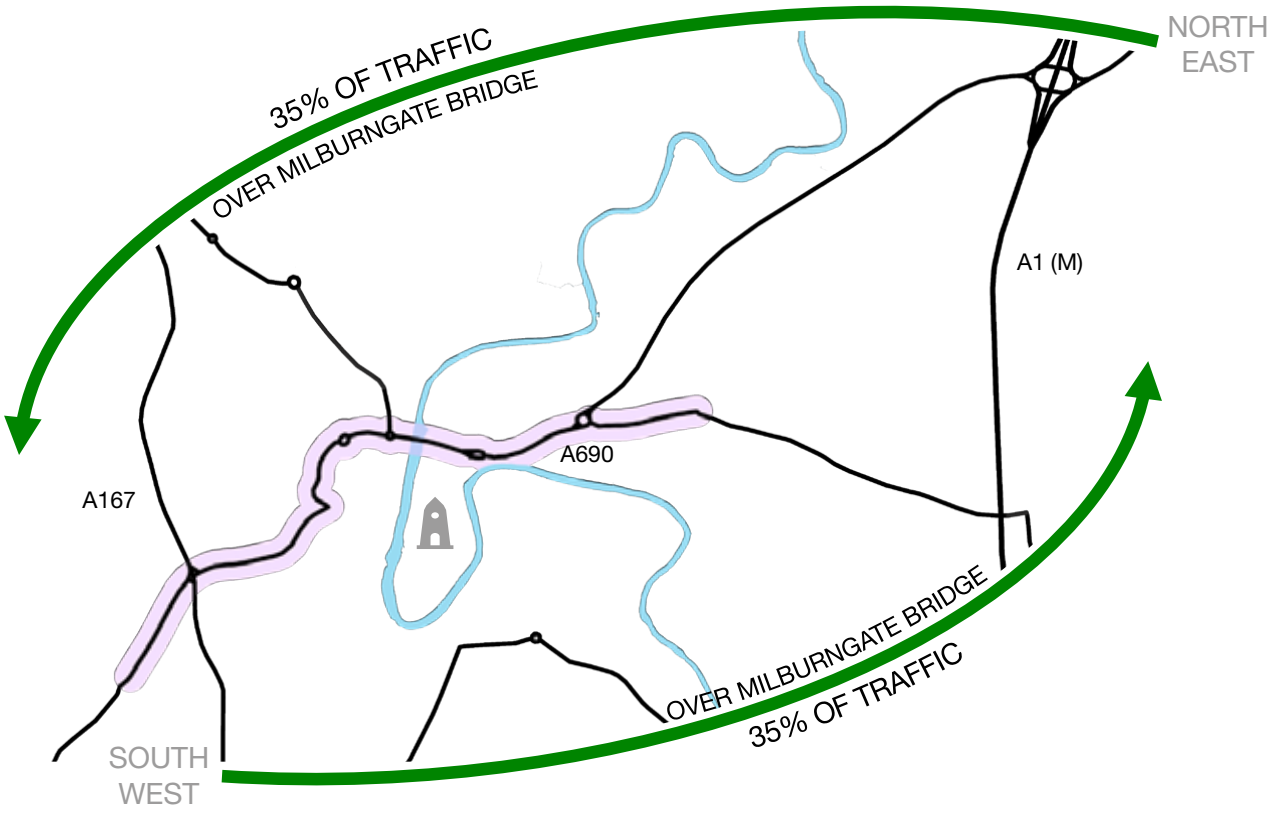
Air quality is also high on the national agenda at the time of writing, with the Department for Environment, Food and Rural Affairs (DEFRA) openly challenging local authorities to better problematic areas of air quality or face fines and interventions such as toll roads/ charge zones.

Given its designation as a World Heritage Site, it is surprising to note that air quality is a significant issue affecting Durham City, impacting on both public health and the natural environment. Durham Cathedral World Heritage Site was the most visited free attraction in the North East in 2015, attracting around 755,000 visitors. In 2016, 4.2 million people visited Durham City, making a total contribution to the Durham City economy of £806 million through expenditure and direct employment. Any worsening of air quality may negatively impact Durham City's appeal to visitors, in turn threatening a large contributor to the city's economy.

Poor air quality in the city is a direct result of decisions taken in the 1960's to channel all traffic into the city. Indeed, at the time the main city centre route was planned it was entitled the "New Through Road". This now feeds over 40,000 vehicles per day into the city centre over a single crossing point of the River Wear.

In 2011 Durham County Council declared an Air Quality Management Area within the centre of Durham City, covering the Highgate, Milburngate and the Gilesgate areas. The AQMA was extended in 2014 to cover the western area of the city, including Neville's Cross, in addition to areas of Claypath and New Elvet. These locations also experience high levels of traffic congestion and queuing vehicles highlighting further the competing interests of a historic centre and a key economic area.

The importance of improving air quality through Durham City is highlighted within the Durham City Sustainable Transport Delivery Plan. The principal objective of this action plan is to remove motorised journeys through the city, which will directly improve air quality standards. Approximately 35% of observed journeys through the centre of the city are designated as 'through journeys'. This highlights a stark lack of available strategic alternatives for longer distance travellers, ensuring that Durham City experiences the negative impacts of these journeys and no tangible benefit.


35% OF TRAFFIC
OVER MILBURNGATE BRIDGE
NORTH
EAST
A1 (M)
A690
A167
OVER MILBURNGATE BRIDGE
35% OF TRAFFIC
SOUTH
WEST

1.4 FUTURE-PROOFING DURHAM'S ROAD NETWORK

The population of County Durham, like the wider north and the rest of the UK, is set to rise in the future. Rising population is likely to be accompanied by rising car ownership levels and this will fundamentally encourage increased private car journeys. Regardless of the setting or geography, it is clear that the 'want' or demand for motorised travel is increasing.

A strategic transport model of the city has recently been produced to assess the impacts of this increasing demand for travel, making use of data from a series of roadside interviews and traffic surveys conducted in 2015. Analysis of the Durham Strategic Transport Model shows Durham is a city which suffers from congestion currently. The contributory factors to the condition of congestion are numerous, and include but are not limited to:

- Key junctions in the city approaching designed capacity
- Key roads through the city approaching design capacity
- A lack of viable strategic alternatives
- A high proportion of through traffic
- Existing parking constraints both on and off street
- Natural pinch points crossing the river when travelling east or west

And most tellingly:

- A road network which has not changed in strategic composition in many years other than to channel more traffic through the city centre.

Congestion on the road network also has a negative impact on sustainable travel modes by causing longer bus journeys and creating an uninviting environment for cyclists and pedestrians to navigate; factors which can discourage the uptake of sustainable travel. It is not just the road network which is under strain, there are also rising patronage levels on the East Coast Main Line.

To address the impacts of these constraints, effective planning is required to identify the forecast traffic impacts on the city's travel network. This includes sustainable modes of travel, alongside existing road network and performance. The County Durham Plan will meet the housing needs of residents, but without the ability to plan and future-proof for increasing housing and jobs growth, the accessibility of Durham City and the wider county will remain relatively static. The transport implications of growth in Durham City are explored later in this study.

2. A TRAVEL NETWORK UNDER PRESSURE

Durham City has grown in importance over many years as an employment, tourism and leisure destination as well as a desirable place in which to live. However, the network of key road routes in and around Durham City has remained largely unchanged for many years. The routes which have served the city for decades have not been supplemented with new road infrastructure to cope with modern day traffic levels and evolving travel patterns. There are a variety of reasons for this due to numerous local constraints, including:

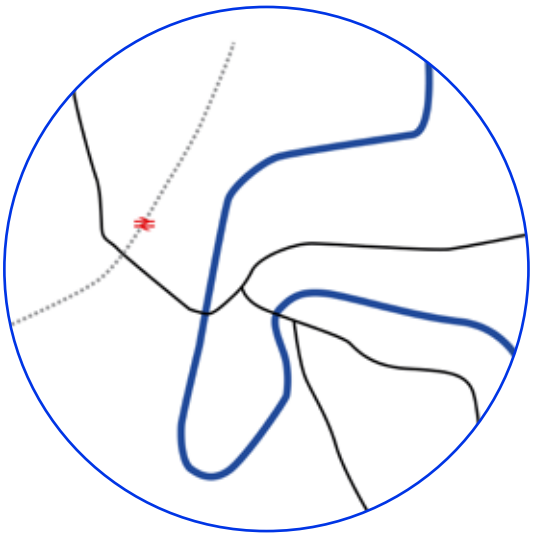
• Green belt - the green belt encircling Durham City is designed to protect the character and landscape of the area.

• Topography – the River Wear runs from south to north through the middle of city and presents a substantial natural barrier.

• Strategic national infrastructure – the A1(M) runs north to south along the eastern edge of the city while the East Coast railway intersects the city centre. Each pose physical barriers to the expansion of Durham's travel infrastructure.

According to the Durham City Major Centre 2016 Statistical Profile report, the population of Durham City increased by 1.6% between 2010 and 2015. The report also highlights an increase of 5.3% in the number of households with access to at least 1 car between 2001 and 2011. However, despite the trends of increasing population and car ownership, traffic levels within Durham City have remained fairly static throughout the last decade. While the rest of the UK has generally experienced traffic growth during this period, the contrasting evidence in Durham suggests the city's road network has essentially reached its capacity.

This suggestion is reinforced by the long-term growth in rail passenger numbers at Durham Railway Station which have more than doubled between 2000-01 and 2015-16. Clearly while the use of other strategic transport infrastructure in Durham such as the East Coast railway is growing, the city's constrained road network is unable to follow suit and support any growth in traffic.



1857

56 years from the first Census, Durham City had a population of between approximately 7,000 and 8,000. The main routes into the city very much reflect the current day road layout and designation.

1953

Almost 100 years later, and the population of County Durham saw an increase of 274%, establishing Durham City as a more prominent destination.

2018

A further 65 years on and the principal road network in Durham City remains incredibly similar to that of 1953, except it now has to cater for upwards of 65,000 residents in the City and many more in the wider region.

3. YOUR TRAVEL THROUGH DURHAM NOW

The Durham City road network currently experiences a number of problems which restrict its ability to operate efficiently and reliably. These problems have been identified through the recent traffic surveys and analysis, which show that several key city centre road links and junctions experience significant delays during peak periods. Strategic routes such as the A167, A691 and A690, which provide north-south and east-west connectivity across the city respectively, are particularly affected by lengthy journey times and low average speeds.

A690

The A690 provides access to Durham for strategic traffic from the east, extending into Sunderland, as well as access to traffic from the north and south through its connection with the A1(M). It carries in the region of 1,300 vehicles westbound into Durham City between 8am and 9am on a typical morning and represents a key arterial route for the area. This is the equivalent of one vehicle every three seconds.

Of this morning peak traffic using the A690, approximately 35% has a destination outside of the city extents. This shows that a significant proportion of traffic is passing through the city centre simply because of a lack of suitable alternative east-west routes across the city.

The Gilesgate and Leazes Bowl junctions along this route are both well know pinch-points which cause delay to journeys to and from the city during the peak morning and evening periods. Travel into Durham City along the A690 from its junction with the A1(M) can take from 7 up to 19 minutes during the morning peak. This equates to an average speed between 7 and 20 mph. This represents an underperformance of a strategically important A-road.

Furthermore, the lack of resilience of this route to cope with traffic incidents leads to queues forming onto the A1(M), impacting upon the operation of the trunk road network.

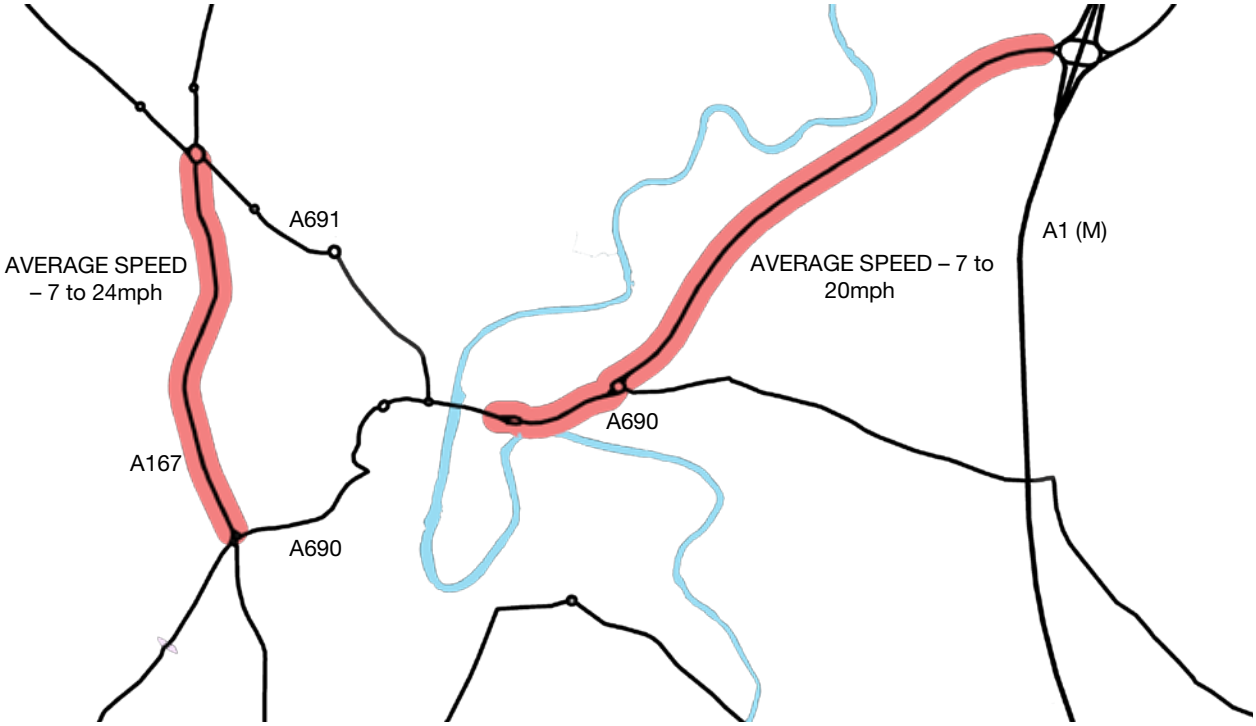
A167

The A167 corridor is a key north-south route connecting the city of Durham with Gateshead and Newcastle upon Tyne. Although it is an historically important route which links these key economic centres, the A167 corridor does not just serve as a through route to traffic. It also performs an important function locally within Durham enabling access to the University Hospital of North Durham, New College Durham, Durham Johnston school and the Sniperley Park and Ride site.

Both the A691 and A690 intersect with the A167 at the Sniperley roundabout and Neville's Cross junctions respectively. Situated between these two junctions is the Toll House Road junction. The interaction of the A167 with each of these busy side roads causes congestion and slow moving traffic which negatively impacts upon the performance of the corridor.

During peak hours at the A691 Sniperley roundabout junction, traffic on the A167 often queues through the junction, which not only causes delay to north-south A167 traffic but also impedes the movement of east-west traffic heading to and from Durham City.

The junction with Toll House Road, which serves the village of Bearpark to the west of the city, currently causes long queues and presents a major constraint for both northbound and southbound traffic on the A167. During the evening peak period in particular, a high demand for southbound A167 traffic turning right onto Toll House Road restricts the southbound flow of traffic along the A167. This junction is also used as a 'rat-run' into Durham City for east-west traffic which uses a combination of Toll House Road and the nearby Redhills Lane to traverse the A167, further highlighting the poor east-west connectivity across Durham.



* Results based on the morning peak period of 8am to 9am.

At the A690 Neville's Cross junction, a heavy flow of traffic during the morning peak period from the western arm of the junction onto the A167 northbound can cause queueing as the northbound traffic merges from two lanes into one. During the evening peak hour, the high volume of traffic turning right from the A167 onto the A690 westbound causes queueing which prevents the straight ahead southbound movement on the A167.

In the morning peak period between 8am and 9am, approximately 1,500 vehicles flow into the Sniperley roundabout from the A167 southbound and the A691 eastbound. Of these 1,500 vehicles, approximately 30% continue southbound along the A167 to the Neville's Cross junction. Similarly, at the Neville's Cross junction, approximately 1,500 vehicles enter the junction from the A167 northbound and the A690 eastbound. Approximately 55% of this traffic continues northbound along the A167 to Sniperley roundabout. This demonstrates that in both directions combined the A167 not only plays an integral role for access into the city but also for strategic north-south journeys.

During the morning peak period, a southbound journey along the A167 from the A691 Sniperley roundabout junction to the A690 Neville's Cross junction can take between 3 and 11 minutes. This equates to an average speed of between 7 and 24 mph. Again, this is substantially below the standard of a strategic A-road, and underlines the congestion issues drivers face on this route.

A691

The A691 corridor which provides a route into Durham City from Consett is also affected by congestion in and around the city centre during peak periods. In particular, Framwellgate Peth approaching Milburngate Bridge represents a key pinch point on the road network. As discussed previously, the interaction of this route with the A167 corridor at the Sniperley roundabout is also a constraint to the flow of traffic in and out of the city at busy times.

INTERNAL JOURNEYS

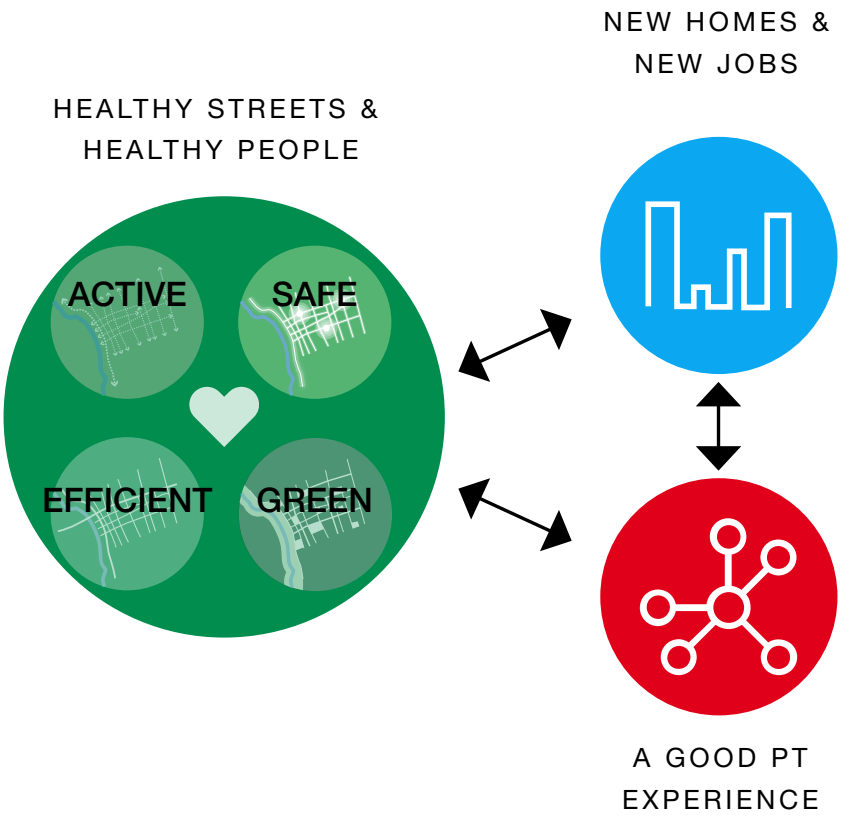
In terms of internal travel within the Durham City area, 30% of car commuting journeys which originate in the city, stay within the city. This level of journey retention is the highest of all the large settlements in the county and reflects Durham City's role as its economic centre.

With such a high dependency on the city centre road network for access to employment, it is vital that the key strategic routes for both private and public transport modes operates as efficiently as possible. The high proportion of through journeys which utilise the arterial city centre routes and occupy limited road space contribute to the problems of increased journey times, queueing traffic and poor air quality described previously. All of these issues have a detrimental effect on both the economy and environment of the city.

PUBLIC/SUSTAINABLE TRANSPORT

When it comes to sustainable travel, the nature of Durham City as a relatively compact city lends itself to the use of active travel modes such as walking and cycling. Indeed, according to the 2011 Census, over one third of the residents of Durham City walk to and from work. There is generally a good quality network of footways and footpaths across the city centre which provide for journeys on foot. This has been complemented by the introduction of shared pedestrian and cycle routes, such as those on Framwellgate Peth, to further support active travel.

Durham Railway Station is a major asset to the city and provides strategic connectivity via the East Coast Mainline. With 2.6m passengers using the station in 2015-16 and passenger numbers growing annually, Durham's rail connection is becoming increasingly important to both the business and visitor economies of the city. In addition to the existing rail facilities, County Durham has an extensive bus network. At the heart of the bus network is Durham City bus station, which is accessible to 70% of County Durham households within 60 minutes' door-to-door bus travel. There are three Park and Ride sites in Durham City situated on three of the main routes into the city, each providing frequent services to surrounding areas and a sustainable alternative to private car journeys into the city. This underlines the strength of Durham City's sustainable transport network and as a whole this network contributes to reducing congestion and pollution in the city centre.



4. YOUR TRAVEL IN THE NEXT 20 YEARS

The demand to travel both into and through Durham City over the next 20 years is only set to increase.

Using a combination of the Durham Strategic Transport Model and national planning tools to forecast growth and development, it is possible to assess what effect this increase in demand will have on the local road network.

Tests have been carried out into the effects of introducing housing and jobs growth in County Durham by the years 2022 and 2037 based on national forecasts. Results have shown that the operation of the road network in Durham City worsens in each of these future years with the anticipated levels of traffic growth based on these forecasts.

In each of these future scenarios, deterioration in the performance of Durham City's already congested road network is anticipated, which increases journey times and delays across the network. By the year 2022, the number of vehicles on the Durham City road network between 8am and 9am is expected to increase by approximately 4%, resulting in a two-way increase in journey times on the city's major routes of up to circa 5%. By 2037, the number of vehicles on the road network in Durham City road between 8am and 9am is expected to increase by approximately 20%, resulting in two-way journey time increases of up to circa 11%.

It is anticipated that the key junctions across the city, including the Sniperley roundabout, Neville's Cross and Leazes Bowl, will be required to handle in total in the region of an additional 1700 vehicles in 2022 and 2800 vehicles in 2037 in the morning peak.

A number of the key junctions and strategic links described earlier in this document move further towards their total design capacity by 2037, as a result of forecast traffic. It should be noted that whilst overall design capacity of the key junctions has not been exceeded as a whole, this doesn't reflect the nuance of some of the arm-to-arm interactions. In current conditions, at key junctions such as Sniperley roundabout, Gilesgate roundabout and Leazes Bowl there are arm-to-arm movements that are at capacity and these would be further exacerbated with forecast traffic increases.

Without the introduction of transport improvements, the current configuration of the Durham City road network will not effectively support traffic increases brought about by housing and employment growth in line with national forecasts.

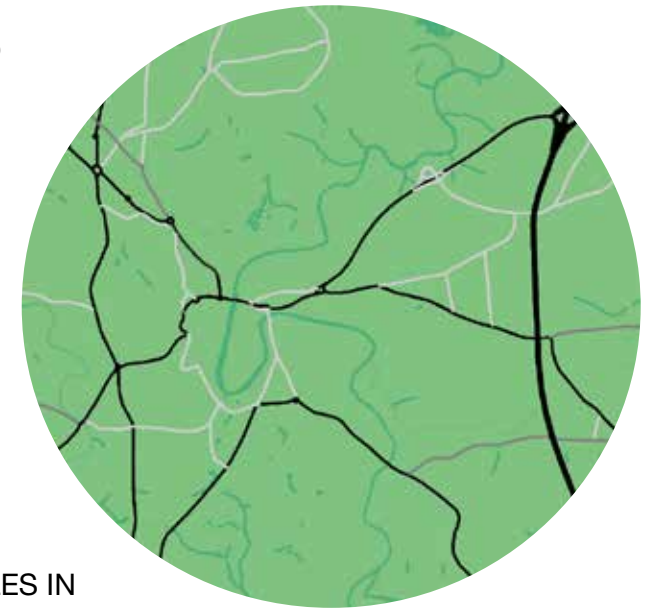
Increasing demand for journeys into the city centre also has the potential to force more non-centre journeys onto inadequate, non-strategic diversionary routes i.e. 'rat-runs', thus spreading congestion further out from the centre.

In summary, the Durham City road network is already constrained under current traffic conditions and is not equipped to adequately handle 'business as usual' i.e. growth without any transport mitigation measures, over the next 20 years.

An increasingly congested road network is more unstable and unreliable and makes journeys less predictable. An increase in congestion will also act as a deterrent to people selecting more sustainable modes and result in an increase in air pollution. These issues will also impact upon realisation of policy goals - promoting economic prosperity, achieving housing growth, improving air quality and future-proofing Durham's travel network. If housing and employment growth targets are unable to be met this will have a direct impact on the economic performance of the city. Having already established via Census data that Durham City represents a key county-wide and regional economic driver, the impacts of stifled economic growth in the city are likely to be far-reaching.

= DELIVERY OF NATIONAL HOUSING AND JOBS FORECASTS

2022 – c.4%
2037 – c.20%



2022 – c.5%
2037 – c.11%

INCREASE IN VEHICLES IN DURHAM CITY

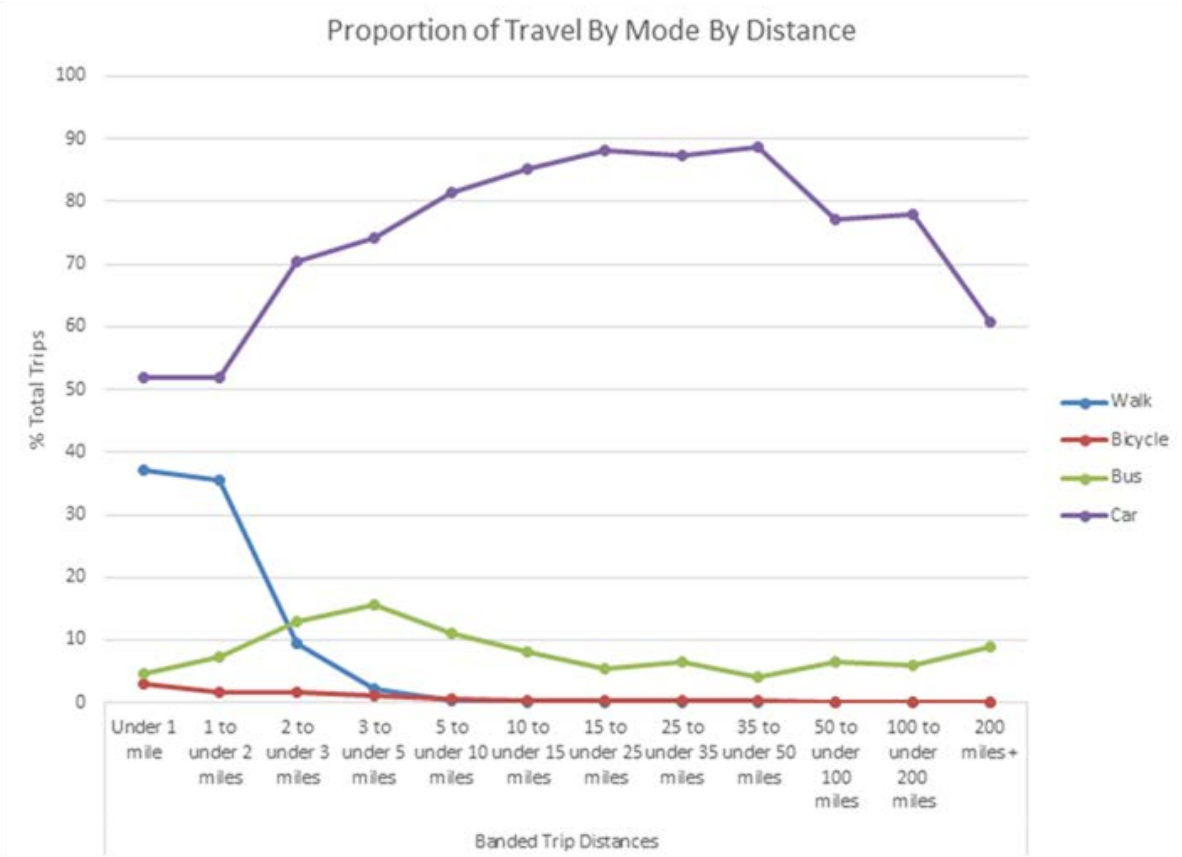
INCREASE IN JOURNEY TIMES ON KEY ROUTES

Results based on the morning peak period of 8am to 9am.

5. THE SOLUTION

As highlighted previously within this document, in order for County Durham to fulfil its economic and housing ambitions, focussed development within the city centre is a priority. However, with the potential benefits of locating housing and jobs growth within the city come a number of constraints that must be addressed to ensure successful delivery. The focus of this document is centred around the direct traffic related impacts of housing and jobs growth within Durham City on the existing road network and how this can enable or deter growth.

It has been shown that travel conditions in and through Durham City today are approaching exceedances in design, resulting in a slower, less resilient road network than that required of a key economic centre. Whilst traffic conditions have been forecast to worsen in the city, this is simply compounding existing issues – i.e. as the demand for travel into and through the city increases, there is no scope for it to do so within the current infrastructure. Therefore, to meet the growth objectives identified, infrastructure solutions in hand with other sustainable transport and air quality solutions must be sought.



5.1 THE OBJECTIVES: IMPROVING AIR QUALITY AND FUTUREPROOFING DURHAM'S ROAD NETWORK

To be able to meet both of these objectives, the solution is relatively straightforward; reduce private car travel in the centre of the city. However, how this is achieved requires a combination of approaches to best maximise the shift of traffic out of the centre of Durham City.

Sustainable travel initiatives, as highlighted previously in this document, can play a significant part in helping to reduce private car journeys through the centre of the city. There are aspirations aligned with the Local Plan to increase the use of sustainable travel modes through the centre of Durham City through various walking, cycling and public bus/park and ride enhancements. These initiatives have encouraged forward thinking about restraining capacity through the centre of the city in order to introduce space for sustainable modes.

This is a crucial, positive step towards reducing private car travel and improving air quality in the centre of Durham City. However, there is still an underlying issue that will not be addressed by the inclusion of the proposed sustainable travel measures; strategic through journeys.

It is known that generally, longer distance journeys are less likely to switch to local, sustainable modes of travel. Rail based travel is different, and caters for long and short distance movements but obviously a key requirement is the availability of stations in close proximity to the start and end points of a journey. Within Durham City, it has been shown that up to 35% of journeys going across Milburngate bridge are external to the city on both sides of the journey. As such, sustainable travel measures that are focussed on providing travel alternatives to and from the centre of Durham City are not going to cater for these strategic through journeys.

Whilst a shift to sustainable travel can be promoted within the city, the National Travel Survey suggests that walking and cycling activity travel drops off considerably after a distance of 3 miles. Public bus is also a well-considered mode of travel up until a journey distance of 5 miles. From that point on, private car travel dominates in terms of mode share.

The diameter of Durham City is roughly 5 miles. Therefore, it could reasonably be expected that the only trips that are able to be influenced greatly by sustainable travel initiatives are those which start and end within, or close to, the city boundary. Strategic through traffic is an issue for the city centre, and this is unlikely to be influenced by any sustainable travel initiatives.

As a benchmark for the possible switch to sustainable modes of travel, Darlington and their Local Sustainable Transport Fund work can be used. This scheme saw a switch of up to 15% of trips being made by sustainable modes. However, this was a sustained and targeted campaign which included educational, promotional and infrastructural measures. If Durham City achieved a 15% switch to sustainable modes from private car, it would result in a reduction of approximately 170 vehicles across the most highly trafficked roads such as the A167 and A690, which would not be enough to mitigate the issues described within this document.

It follows that a solution to removing cross-city strategic journeys must be found, correcting previous errors in planning major roads through the city centre. The solution to removing these journeys is to provide a strategic alternative for east-west (or north-east-south west) movement. This is in line with a deficiency of suitable east-west connectivity in the wider north.

Through testing in the Durham Strategic Transport Model, it becomes clear that a Northern Relief Road (NRR) facilitates the removal of journeys from the city centre. The NRR would be located towards the north east of the city centre between the A167 at Pity Me and the A690 at Carrville. Testing has been carried out for 2037. Between 8am and 9am, in excess of 1,700 vehicles use this alternative route in both directions. This results in a reduction of circa 13% of vehicles through the city centre in both directions. Similarly, a reduction of over 8% of vehicles is seen through key junctions in the city, illustrating that traffic levels within the centre are reduced as a result of the NRR.

A key facet of the Sustainable Transport Delivery Plan was that together with the creation of a Northern Relief Road, demand restraint measures would be introduced in the city centre. The NRR improves journey times on the A167 and A177 in the AM peak but results in additional delay on the A690 as shown below. This is due to the lane reduction on Milburngate Bridge, which increases journey times through the city centre. This is advantageous as it encourages use of the NRR for through traffic.

- A690 – a two-way increase of up to 1%
- A167 – a two-way reduction of up to 4%
- A691/A177 – a two-way reduction of up to 5%

It is clear from these figures that the NRR shifts strategic traffic from the city centre. The benefits of this re-routing are numerous. Direct impacts include:

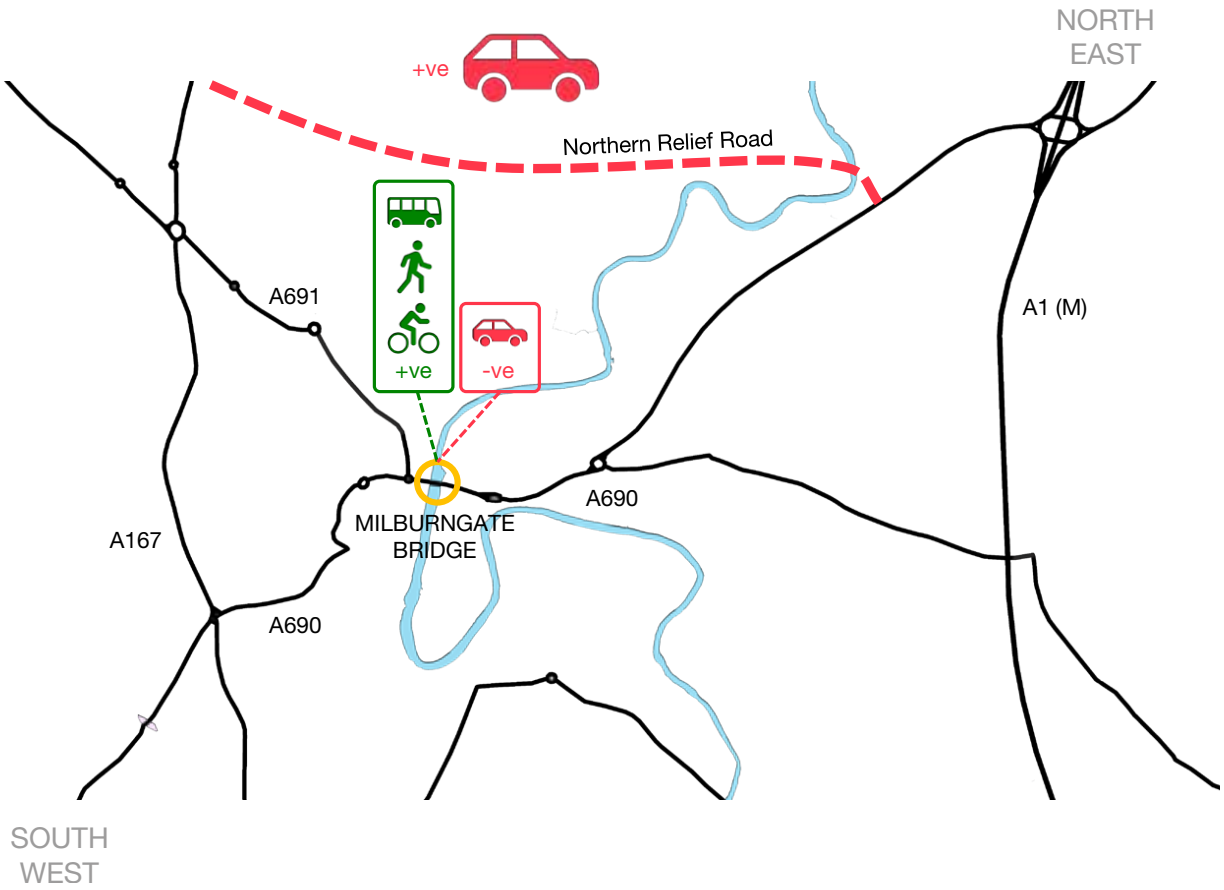
- Air quality improvements within the designated AQMA areas and known pinch points within the city centre. This in turn will have direct benefits on public health and contribute towards the promotion of a World Heritage Site. Further air quality modelling is ongoing and the potential exists to eradicate the current exceedances in the city.

• Sustainable travel is supported on key routes through the city promoting inward investment in initiatives to benefit walkers, cyclists and public transport users.

Additionally, there is a contributory benefit to the inclusion of the NRR:

• It improves travel conditions within the constrained urban core of Durham City, allowing for the enabling of development of housing to meet national forecasts and the introduction of jobs that are more likely to be served by the local labour force, increasing the productivity of the county.

However, it should be noted that with the introduction of the NRR, there are still wider constraints within the city that would need to be addressed in order to meet the objectives set out within this document. Such issues include the interaction with the western side of the city. The A167 is known to be another one of the busiest routes through the city along with the A690. Removing strategic traffic from the city centre via the NRR migrates issues with congestion and network constraints to the north west of the city around the Sniperley area. As such, a more holistic approach is required to safeguard the performance of the entire network in the future and the delivery of housing and jobs growth.



5.2 THE OBJECTIVE: PROMOTING ECONOMIC PROSPERITY, ACHIEVING HOUSING GROWTH IN LINE WITH WIDER GOVERNMENT POLICY

Notwithstanding the objectives, constraints and solutions identified earlier in this document, further improvements are required to be made to Durham City's road network infrastructure to fully unlock housing and jobs growth in and around the city, facilitating the meeting of government targets and wider aspirations to increase the economic prosperity of the county.

The A167 has been shown, through the Durham Strategic Transport Model and associated Micro-Simulation Modelling, to be relatively one of the most congested and constrained key corridors through the city. Regular queuing into the city on busy morning peaks results in delay in accessing key employment or attraction centres such as County Hall, University Hospital of North Durham or Durham University. Furthermore, this congestion passes local schools presenting a direct conflict between walking and private car movements.

Unlocking this corridor through reducing congestion is seen as key to enabling further growth, both housing and jobs, within the city. As part of recent studies into the options available on the A167, work has been carried out by AECOM to identify whether remedial solutions within the footprint of the current infrastructure is possible. The conclusions from this piece of analysis suggested that there is not enough scope to make modifications to the junctions or connecting roads on the A167 in its current layout to fundamentally improve traffic through flow. As such, the conclusions were drawn that fundamentally, congestion along this route is not alleviated enough to solve the current issues or forecast issues associated with the demand for travel along the corridor increasing. That is to say that the network can't cope under current peak hour conditions, therefore it has little chance of coping with any increased traffic volumes as a result of new housing or jobs growth in the local vicinity.

Similarly, to the A690, the A167 caters for large numbers of strategic journeys. Along with the A1(M), it provides only one of two high standard north-south routes. To cater for these strategic journeys, and alleviate known congestion issues along the A167, a Western Relief Road (WRR) is proposed. The WRR would connect the A691 and A167 with the A690, to the west of Durham City centre.

Through testing in the Durham Strategic Transport Model, it becomes clear that the WRR in isolation facilitates the removal of journeys from the A167. Testing has again been carried out for 2037. Between 8am and 9am, up to approximately 1,400 vehicles use this alternative route in both directions. This results in a reduction of approximately 30% of vehicles (between Sniperley roundabout and Neville's Cross) along the A167 in both directions. Similarly, a reduction of approximately 4% of vehicles is seen through key junctions spanning the A690 and A167, illustrating that traffic levels within the city are reduced as a result of the WRR.

The reduction in traffic on key strategic corridors and junctions within the city inevitably during the AM peak creates a product of improved journey times through the centre, more specifically:

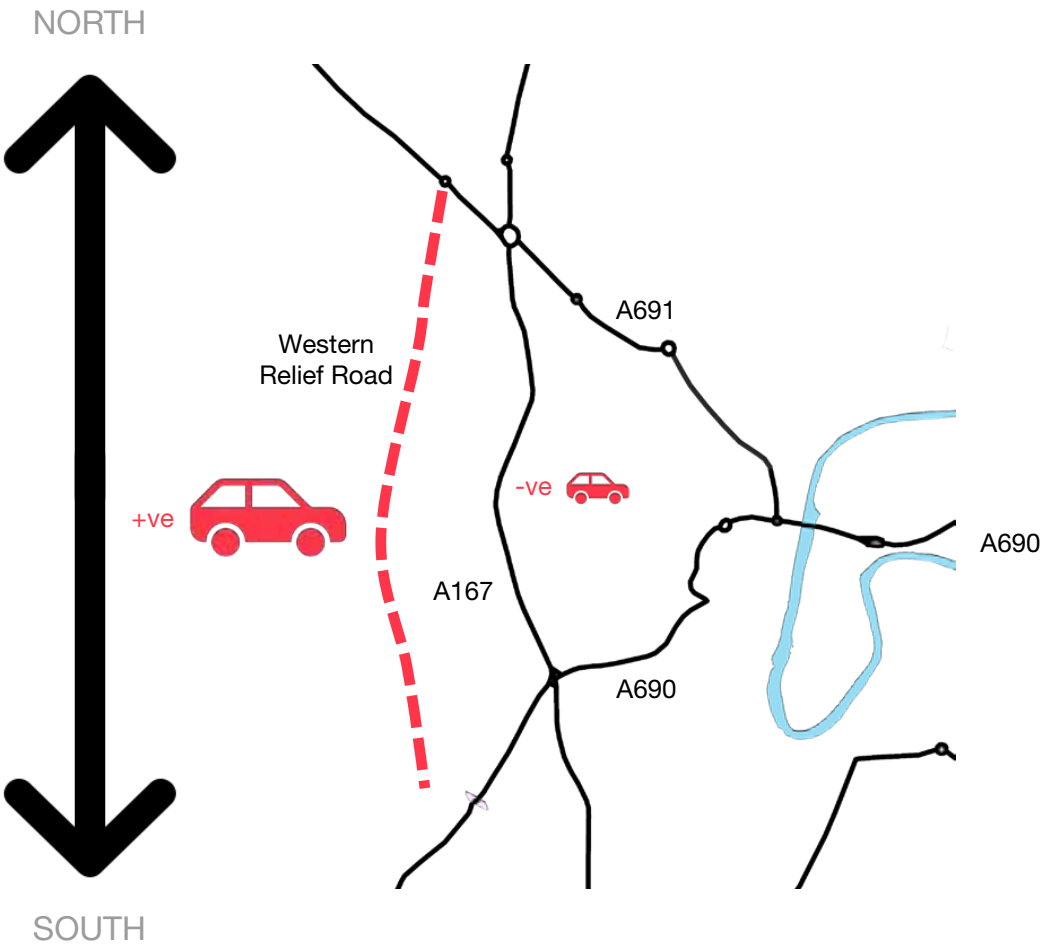
- A690 – a two-way reduction of up to 1%
- A167 – a two-way reduction of up to 9%
- A691/A177 – a two-way reduction of up to 1%

It is clear from these figures that the WRR shifts strategic traffic from the A167. Direct benefits include:

• Less congestion on the existing A167 which provides a more reliable and resilient route for north-south journeys to or through Durham City.

• Existing infrastructure on the A167 is more capable of coping not only with existing traffic conditions, but forecast traffic conditions associated with additional housing and jobs growth.

The direct impacts of the WRR on removal of car traffic through the centre of Durham City is less pronounced than the NRR. However, the WRR is viewed as a network correction to better deal with current traffic conditions that have been shown to be unsuitable in terms of accommodating growth.

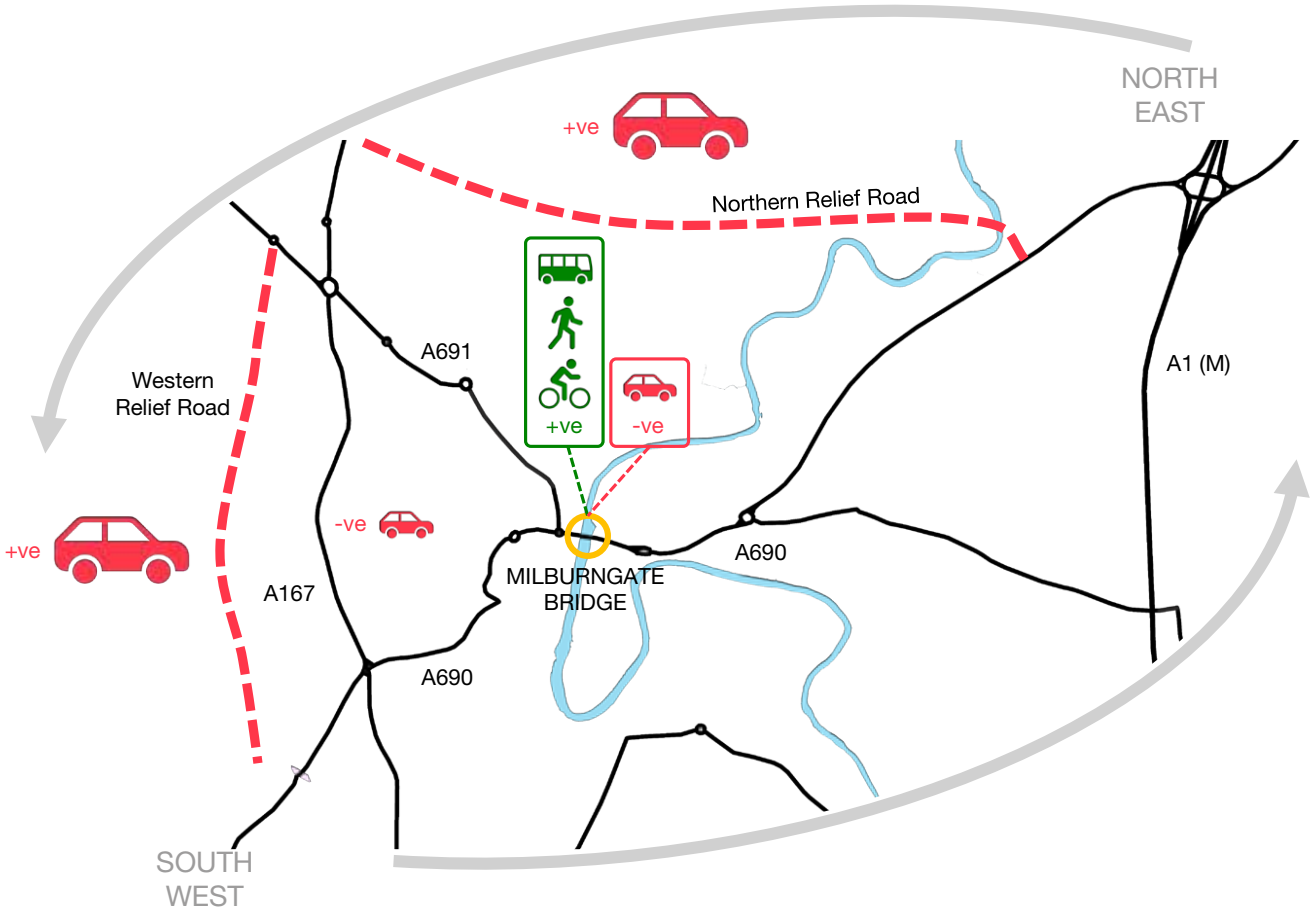


5.3 ACHIEVING ALL OBJECTIVES

Due to the forecast impacts on traffic of the two relief roads in isolation, owing to the strategic movements they serve, their location and tie-in points on the existing road network, there is greater benefit achieved by introducing the relief roads in combination than in isolation.

Between 8am and 9am in 2037 the two relief roads:

- reduce traffic at key junctions along the A690 and A167 by up to circa 11%
- reduce traffic along the A690 by circa 14% and the A167 by circa 30%
- reduce the two-way journey times along the A690 by up to circa 7% and the A167 by up to circa 14%;
- similar benefits can be seen in the evening peak from 5pm to 6pm; and
- allow the introduction of dedicated sustainable transport initiatives in the centre of Durham City.



This in turn allows for:

• Housing growth to be delivered in line with national forecasts promoting housing for economically active residents who will be more likely to work in the city, thus reducing the potential for productivity leakage across the county border

• Jobs growth to be delivered in line with national forecasts; stimulating economic productivity and aiming to help rebalance the labour force and employment market

• Traffic conditions to be improved to a state of betterment when compared with a future scenario with a low level of jobs and housing growth and no relief roads

• Air quality improvements will be made in the city centre befitting the city and its World Heritage Site status; and

• Future-proofing of the transport network to accommodate the above.

One potential consequence of providing the relief roads is induced traffic. Induced traffic is defined as new traffic that would not have occurred without the increase to network capacity, and can result from changes in:

• Mode of travel, e.g. switching from public transport to driving;

• Frequency of travel, specifically in terms of making additional trips that were not made previously;

• Distance travelled by changing route;

• Distance travelled by changing destination; and

• In the longer term, the distance travelled due to changes in residential or employment location or as a result of changes in land-use.

Induced traffic may be a perceived consequence of the Northern and Western relief roads. However, this may not necessarily be the case. The traffic analysis undertaken to date already accounts for induced traffic due to changes in route, and longer-term changes in land use (residential and employment). Surveys show that County Durham has lower levels of sustainable transport usage than the regional and national and so there is limited potential for mode switch. Of the remaining elements, it is not expected that these will result in significant levels of induced traffic.

This view is reinforced by a recent report for the Department for Transport*, which found that traffic generated by building new road capacity will rarely cancel out the benefits of building that capacity. Induced demand is generally higher for capacity improvements in large urban areas and there is little evidence that high levels of induced demand would occur in smaller urban and more rural areas.

*WSP and RAND, LATEST EVIDENCE ON INDUCED TRAVEL DEMAND: AN EVIDENCE REVIEW (2018)

JACOBS