

# Technical Note

**Project:** Design Standards and Practices for Walking and Cycling in Carnforth

**Subject:** Research Note

<b>Client:</b>	Manchester University	<b>Version:</b>	A
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<b>Date:</b>	04/02/2021	<b>Approved:</b>	CS

## I Introduction

### I.1 Overview

- 1.1.1 PJA has been commissioned by Manchester University to undertake a research exercise to support the Carnforth Town Council Neighbourhood Plan. This technical note sets out the case for introducing walking and cycling measures specifically focused on how design and placemaking can contribute towards better health, social and environmental outcomes.
- 1.1.2 A literature review has been undertaken to identify case studies implemented in towns and villages, with similar geographical and demographic characteristics to Carnforth.

### I.2 Carnforth

- 1.2.1 Carnforth is a small market town with a historical core, located to the north of Lancaster in the north of Lancashire near the border with Cumbria and in close proximity to both the Arncliffe & Silverdale Area of Outstanding Natural Beauty (AONB) and the Lake District National Park. Carnforth has a population of 5,560 (measured in the 2011 census) and benefits from its own railway station on the West Coast Mainline, located approximately 5 minutes' walk from the Market Street / A6 junction. The A6 accommodates a significant level of traffic which runs through the centre of the town, resulting in Air Quality issues on the High Street. Carnforth was declared an Air Quality Management Area in July 2007. The M6 runs in a north-south alignment approximately 1km east of the town providing links to Kendal, Lancaster, and Preston.
- 1.2.2 The Lancaster Canal runs through the centre of the town, separating the town centre from the high school. There is only one crossing point of the Lancaster Canal which acts as a pinch point for vehicles between the town centre and junction 35 of the M6.

- 1.2.3 Development pressures on the edge of the town could exacerbate these problems, with future employment planned to the north of the town, and to the east adjacent to the M6. Residential development is also planned for Land at Lundsfield Quarry and Land South of Windemere Road, totalling c.700 dwellings.

## 2 Literature Review

### 2.1 General Overview

- 2.1.1 The health benefits of walking and cycling are well reported, with research showing<sup>1</sup> that keeping physically active can reduce the risk of heart and circulatory disease by as much as 35% and risk of early death by as much as 30%. Sustrans also refer to a paper produced by Neves and Brand (2019)<sup>2</sup> which states that “walking or cycling can realistically substitute for 41% of short car trips (less than 3 miles), saving nearly 5% of CO2e emissions from car travel. This is on top of 5% of ‘avoided’ emissions from cars due to existing walking and cycling.
- 2.1.2 A report prepared for the Department of Transport, ‘Investing in Cycling & Walking: Rapid Evidence Assessment (2016)’<sup>3</sup> reviewed over 300 evidence sources to develop a set of research questions. With regards to the effectiveness of different interventions to increasing cycling and walking, it was identified that a mix of infrastructural improvements/provision, community-wide communications/campaigns, targeted (usually community-level) support and some individually specific support was typically involved. It was reported that barriers to walking and cycling are often related to “*either safety concerns due to lack of appropriate infrastructure, or to various practical and contextual issues such as weather, topography, travel distances and the need to carry heavy bags*”.
- 2.1.3 The fifth research question within the document concerns the impact of cycling and walking investment on physical activity and health, and the associated costs. The report summarised that the “scope for health benefits from walking and cycling interventions is significant, and the potential savings (to healthcare providers/systems) far outweigh the investment costs in most cases”.

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<sup>1</sup> <https://www.sustrans.org.uk/our-blog/get-active/2019/everyday-walking-and-cycling/health-benefits-of-cycling-and-walking#:~:text=Getting%20out%20walking%20or%20cycling,your%20general%20health%20and%20wellbeing.>

<sup>2</sup> Assessing the potential for carbon emissions savings from replacing short car trips with walking and cycling using a mixed GPS-travel diary approach

<sup>3</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/606513/cycling-walking-rapid-evidence-assessment.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/606513/cycling-walking-rapid-evidence-assessment.pdf)

- 2.1.4 This technical note will now provide examples of good practice and design which has been implemented to improve local walking and cycling environments.

## **2.2 Traffic in Villages Principles**

- 2.2.1 'Traffic in Villages' is a toolkit to guide design for rural roads within communities and was produced by the Dorset AONB Partnership in conjunction with Hamilton-Baillie Associates. The guidance builds on a number of successful pilot projects and is informed by best practice from the UK and elsewhere in mainland Europe. The principles move away from typical highway design focused principally on providing capacity for vehicular movement to more people-oriented environments which provide a better balance on how all users can access that space equitably.
- 2.2.2 The approach seeks to reduce the dominance of traffic and enable walking and cycling through sensitive design that enhances the character of the village. The key to this is providing design cues that encourage drivers to reduce their speed. Psychological traffic calming measures such as visual narrowing can reduce speeds, without the need for artificial bumps, signs, and chicanes.
- 2.2.3 These design principles have also been used within villages to mitigate against adverse traffic impacts arising from new residential development. By altering the way that vehicular traffic behaves, it can radically improve the environment for walking and cycling.

## **2.3 LTN 1/20**

- 2.3.1 Local Transport Note (LTN) 1/20 was published in July 2020 alongside 'Gear Change – A Bold Vision for Cycling and Walking' and provides guidance and good practice for the design of cycle infrastructure, in support of Local Cycling and Walking Infrastructure plans and investment strategies.
- 2.3.2 There are five core design principles which should be used to enable more people to travel by cycle or on foot. Networks and routes should be Coherent; Direct; Safe; Comfortable and Attractive. It is no longer considered acceptable to provide infrastructure that is just statistically safe, it needs to be perceived to be safe for all users.
- 2.3.3 Figure 4.1 of the LTN 1/20 indicates the level of protection that should be afforded to cyclists in different traffic conditions.

**Figure 4.1:** Appropriate protection from motor traffic on highways

Speed Limit <sup>1</sup>	Motor Traffic Flow (pcu/24 hour) <sup>2</sup>	Protected Space for Cycling			Cycle Lane (mandatory/ advisory)	Mixed Traffic
		Fully Kerbed Cycle Track	Stepped Cycle Track	Light Segregation		
20 mph <sup>3</sup>	0					
	2000					
	4000					
	6000+					
30 mph	0					
	2000					
	4000					
	6000+					
40 mph	Any					
50+ mph	Any					

	Provision suitable for most people
	Provision not suitable for all people and will exclude some potential users and/or have safety concerns
	Provision suitable for few people and will exclude most potential users and/or have safety concerns

**Notes:**

1. If the 85<sup>th</sup> percentile speed is more than 10% above the speed limit the next highest speed limit should be applied
2. The recommended provision assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow
3. In rural areas achieving speeds of 20mph may be difficult, and so shared routes with speeds of up to 30mph will be generally acceptable with motor vehicle flows of up to 1,000 pcu per day

## 2.4 Case Studies

### Poynton

- 2.4.1 The Poynton shared space scheme was designed by Hamilton-Baillie Associates (author of the Traffic in Villages principles).
- 2.4.2 Poynton is a town in Cheshire which has a population of 14,000 (2011 census). Poynton, like Carnforth, has a major road running through the centre of the town; the A523 which provides a link south to Macclesfield and north to the Manchester Airport Eastern Link Road and the A6. Poynton Rail Station is located on the edge of the town, running a regular service to Stoke-on-Trent and Manchester Piccadilly.

- 2.4.3 A study of the declining economic performance of the town indicated that severance created by heavily trafficked roads was discouraging walking and cycling and leading to lower levels of investment in the town.
- 2.4.4 The scheme was designed to reduce the adverse impacts associated with the intersection of two major routes at the heart of the town which had become a hostile and congested traffic space, dominated by traffic signals, guardrailing and road markings. Like Carnforth, the design still had to accommodate through movements, provide access for heavy goods vehicles and local bus services.
- 2.4.5 The solution was to reimagine how space was used in the centre of Poynton which also included streetscape changes to Park Lane, as well as the decision to simplify and remove all traffic signals, road markings and barriers and the creation of a free-flow, low-speed integrated streetscape. Figures 1 and 2 below show the impact of these changes.

**Figure 1: Park Lane**



**Figure 2: Fountain Place**



- 2.4.6 The removal of traffic signals alongside the narrowing of entry roads and removal of signs and markings, has resulted in traffic speed reductions. The average speed is now in the order of 20 mph. On Park Lane, speed has reduced by 6–7mph.
- 2.4.7 It has been reported that the combination of psychological measures to influence driver behaviour appear to have succeeded in establishing a very different speed environment, and one that allows the informal interaction of pedestrians through courtesy and communication without generating significant traffic delays.
- 2.4.8 Prior to the scheme implementation, traffic delays of eight or nine minutes were measured on the A523 during peak times, with drivers taking several cycles of the signals to pass through the junction. Whilst delays do still occur, they are measured to be approximately three minutes during peak times<sup>4</sup>.
- 2.4.9 Queuing traffic along Park Lane, the primary shopping street, has also been substantially reduced, now less than half its previous length.
- 2.4.10 There has been one minor personal injury accident in the first three years of Park Lane's operation, and none in Fountain Place, compared to 4-7 serious incidents in each of the three years leading up to the project<sup>5</sup>.
- 2.4.11 Importantly, the perception of the town has changed significantly. The streetscape improvements have increased footfall and attracted higher quality retail and leisure tenants to

<sup>4</sup> Creating better streets: Inclusive and accessible places. Reviewing shared space. (2018)

<sup>5</sup> <https://www.ice.org.uk/knowledge-and-resources/case-studies/poynton-town-centre>



move into the town. This has manifested itself in improved retail frontages and increased high street local spend bucking national trends.



#### **Latton – ‘Psychological’ Traffic Calming<sup>6</sup>**

- 2.4.12 Latton is a village and civil parish in Wiltshire, England, 1.5 miles north of Cricklade, on the county border with Gloucestershire. The village is bypassed by the A419 road from Swindon to Cirencester with the old roman road through the centre of the village now de-trunked. However, there were no associated changes in the streetscape to reflect the change in road hierarchy. With reduced traffic flows, problems with speeding increased.
- 2.4.13 To counter this the local parish council and the Transport Research Laboratory (TRL) ran a series of focus groups and workshops with local residents to identify a package of visual traffic calming measures. An extract from the TRL report, presenting the traffic calming options is provided at Figure 3.

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<sup>6</sup> Psychological Traffic Calming. Prepared for the Traffic Management Division, Department for Transport. (Kennedy et al., 2005)

Figure 3: Extract from the TRL report





- 2.4.14 Changes to the village included creation of a gateway feature, reduction in the size of signs and lamp columns, addition of sheltered parking bays to create gentle chicanes and break up sightlines, removal of centre line markings, increased emphasis of a village triangle and memorial, and a reduction in the speed limit from 40 mph to 30 mph.
- 2.4.15 Since the introduction of these measures, mean speeds within the village have been reduced by 7–8 mph, with 85th percentile reductions of 8–10 mph. The proportion of vehicles exceeding 40mph has also fallen from 50% to around 10%. Residents now feel better protected from inappropriate speeds as there is a 90% chance of a fatality when hit at 40mph whilst 50% survive at 30mph<sup>7</sup>. The gateway features introduced at Latton are shown in Figure 4 below.

**Figure 4: Latton Gateway Features**



### Hebden Bridge<sup>8</sup>

- 2.4.16 Hebden Bridge is a market town of over 4,500 people, and due to its success as a tourist destination, the town suffered with growing traffic and accessibility problems. Hebden Bridge Rail Station is located to the south of the town and delivers a regular service to Leeds, Manchester, Wigan, and York. The A646 runs through the centre of the town, providing a link to Halifax in the East and Burnley in the West.
- 2.4.17 The scheme identified looked to improve the physical environment through various means, including:
- Pedestrian Priority

<sup>7</sup> Roadwise.co.uk

<sup>8</sup> [https://www.jtp.co.uk/cms/pdfs/UCV\\_hebden\\_bridge.pdf](https://www.jtp.co.uk/cms/pdfs/UCV_hebden_bridge.pdf)

- Re-routing of traffic
- Vehicle-speed reduction measures (20mph across the whole town)
- Landscaping and general improvements
- Improvements to cycling and walking infrastructure along a 6km section of the Rochdale Canal towpath between Hebden Bridge and Todmorden.

2.4.18 As a direct result of the pedestrianisation, there has been an improvement to the visual impact and functioning of the town, making it a better place to live, trade and visit. The shared open space has been utilised by local cafes with new licensed outdoor seating and footfall has increased by 100% along the upgraded streets and by 25% in the town as a whole.

2.4.19 A key success was down to consultation, with most respondents in favour of the regeneration strategy. Leaflets were issue to 10,000 households, of which 1,800 questionnaires returned showing 85% support.

Figure 5: Bridge Gate (photo credit Paul Harrop)



cc-by-sa/2.0 - Bridge Gate, Hebden Bridge by Paul Harrop - [geograph.org.uk/p/5343480](https://geograph.org.uk/p/5343480)



Figure 6: Bridge Gate (photo credit Paul Anderson)



- 2.4.20 The Hebden Bridge scheme was funded by a combination of the Yorkshire Forward RMT programme (£600,000), the Calderdale Council LTP budget (1,333,000) and an Interregnum bid (100,000).

#### **Faversham – 20mph scheme**

- 2.4.21 There are studies that show 20mph schemes encourage active travel, by increasing walking and cycling levels.
- 2.4.22 A 20mph research study undertaken by Atkins, AECOM, and Professor Mike Maher<sup>9</sup> concluded that:

<sup>9</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/757302/20mph-technical-report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757302/20mph-technical-report.pdf)



*“Feedback from local residents and road users suggest that slower speeds are one of a combination of factors required to improve the environment for walking and cycling. In the case study areas, there continues to be a range of barriers which discourage walking and cycling. Time constraints, journey distance, and a general preference for driving remain important considerations. However, there are encouraging signs of a small (but significant) increase in use of active travel modes, based on self-reported evidence. In the case study areas, 5% of residents surveyed said that they are walking more and 2% said that they are cycling more since the introduction of the 20mph limits”.*

- 2.4.23 If a pedestrian is hit at 20mph, there is a 2.5% chance that a pedestrian is killed, whilst at 30mph there is a 20% chance of a fatality<sup>10</sup>.

### 3 Application of measures to Carnforth

#### 3.1 Desktop Review of Issues

- 3.1.1 Carnforth Town Council have identified transport as a key issue, with congestion in its town centre and many commuting trips being undertaken by car. An Air Quality Management Area has been established within part of central Carnforth, centred on the junction between Market Street (West) and the A6.
- 3.1.2 There are also concerns about the potential for traffic to increase from proposed residential developments east of the canal.
- 3.1.3 Although the town is a potential stopping off point en route to the Lake District, the current high street does not capitalise on its location and is in decline.
- 3.1.4 Our desktop review has identified the following issues: -
- Car dominated environments which detract from the physical environment.
  - Inappropriate vehicle speeds particularly on the A6
  - Narrow pavements which are unpleasant to use and which have a particularly negative impact on mobility impaired users.
  - Street clutter and signage
  - Lack of greening on streets
  - Absence of priority for pedestrians and cyclists

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<sup>10</sup> Roadwise.o.uk

- Setting of heritage assets blighted by traffic impacts.
- Poor air quality in sensitive locations
- Poor sense of arrival

## 3.2 Suggested Interventions

### Creating a sense of arrival

- 3.2.1 Gateway features on either approach to the town will help to create a stronger sense of arrival for visitors. Using different surfacing materials and road narrowings at town limits has been proven to lower vehicle speeds and raise driver awareness that they are entering a residential area. By incorporating locally referenced materials into the design, it could help to emphasize Carnforth's semi-rural setting and heritage qualities with drivers noting the change of environment as they enter the residential area. Figure 7 provides some precedent imagery of locations containing these features.

Figure 7: Proposed Gateway Feature



## Reducing vehicle speeds

- 3.2.2 For a town such as Carnforth, visual narrowing could work effectively to reduce speeds throughout the town, without the need to provide road humps, chicanes or signs which are more urban in character.
- 3.2.3 Visual narrowing can be in the form of surface treatments, along the centre and the outsides of the road. It is recommended that any guardrailings adjacent to residential properties is removed as evidence suggests that this encourages greater vehicle speeds. An active frontage to the carriageway provides more design cues for drivers to negotiate the road ahead with care and.
- 3.2.4 Lower vehicle speeds also provide a better environment for cyclists and for pedestrians and are particularly important where physical constraints mean there is no opportunity to provide protected cycle lanes. Precedent imagery for vehicle narrowing is shown in the figure below.

**Figure 8: Visual Narrowing**



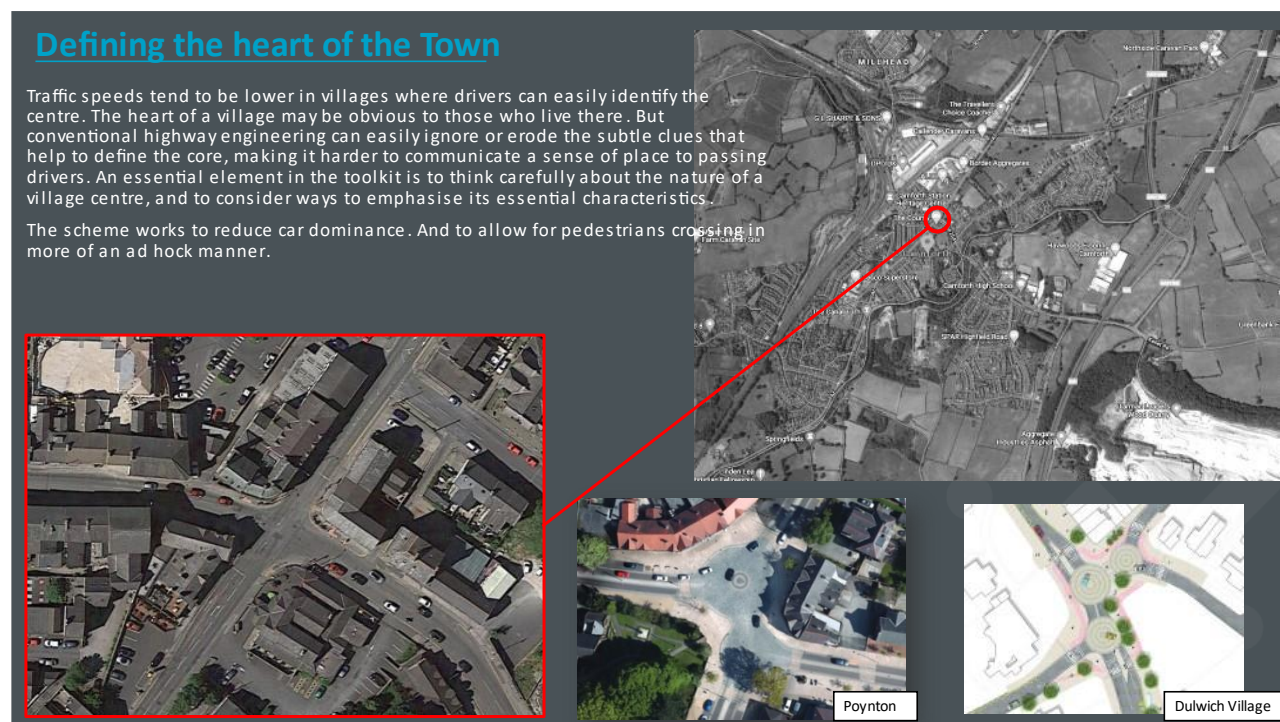
## Market Street / Lancaster Road junction

- 3.2.5 Carnforth's historic core centred around Market Street and Scotland Road have been in existence for nearly two centuries, prior to the advent of private motor vehicles. However, its historical significance has been eroded by the large volumes of traffic passing through the centre of the town.



- 3.2.6 Traffic speeds are lower when drivers can identify the centre of a town, particularly to visitors who are new to the area. As was demonstrated with the Poynton scheme in Cheshire a placemaking scheme at a central junction can work to reduce car dominance and to provide pedestrians with more convenient opportunities to cross the carriageway.
- 3.2.7 It is considered that the junction of Market Street/Lancaster Road/Scotland Street would benefit from the removal of signals to provide a mini roundabout arrangement, complete with half height kerbs to encourage vehicles to approach the junction with caution and to give the appearance of a shared space.
- 3.2.8 Removing the signalised junction, would remove 'running the red' movements and would result in improvements to noise and air quality because of the reduction in start / stop traffic. With lower vehicle speeds overall, this would provide pedestrians with more opportunities to informally cross in gaps of traffic and safely on zebra crossings.
- 3.2.9 As part of this design, there is also an opportunity to reduce the two-lane approach (since a right turn filter will no longer be required), and to reallocate space to pedestrians and cyclists, with opportunities for the Carnforth Hotel and the Country Hotel to utilise some of this space for outdoor seating.

**Figure 9: Proposed Junction Improvements**





3.2.10 A further example of where this has been achieved elsewhere is provided below.

Figure 10: Example Junction Enhancements



#### Improving the pedestrian environment on Market Street

- 3.2.11 Market Street provides a key connection from the rail station to the heart of the town, and benefits from retail frontage activity and community uses along its length. It is proposed that this connection is strengthened for walking and cycling by widening the footway to allow two pushchairs to comfortably pass and to enable more opportunities for informal conversations and places to stop and rest.
- 3.2.12 It is considered that there are opportunities to replace some of the parking on Market Street for parklets, planting, cycle parking and seating areas with parking displaced to other nearby locations such as the train station.
- 3.2.13 By providing secure cycle parking spaces, more people are likely to cycle to the town who may otherwise have taken the journey by car. According to Bike Life (the UK's biggest assessment of cycling), a lack of cycle storage or facilities at home or work is one of the main barriers to cycling. '21% of respondents said that it's why they don't cycle, or cycle less often'<sup>11</sup>.

<sup>11</sup> [https://www.sustrans.org.uk/media/5942/bikelife19\\_aggregatedreport.pdf](https://www.sustrans.org.uk/media/5942/bikelife19_aggregatedreport.pdf)

- 3.2.14 Evidence suggests that those visiting high streets on foot are more likely to visit frequently and spend more time than those arriving by car. A report by Living Streets stated: “Footfall on the UK’s high streets has fallen by 22.2% since 2007. However, research suggests that well-planned improvements to public spaces can boost footfall and trading by up to 40%.”<sup>12</sup>
- 3.2.15 According to research carried out using a mixed GPD-travel diary approach, walking or cycling could realistically replace 41% of short car journeys, saving c.5% of CO<sup>2</sup> emissions from car trips<sup>13</sup>. It should also be noted, as the Victoria Transport Policy Institute (2008) states, emissions will further decline as during short car journeys the engine is still cool for a large proportion of the journey and the vehicle is therefore less efficient.

**Figure 11: Proposed Measures for Market Street**



- 3.2.16 The removal of parking along the high street will have a beneficial impact on the air quality, with vehicles no longer stopping for spaces, and smoother flows of traffic.

<sup>12</sup> <https://www.livingstreets.org.uk/media/3890/pedestrian-pound-2018.pdf>

<sup>13</sup> Neves, A., Brand, C., (2019) ‘Assessing the potential for carbon emissions savings from replacing short car trips with walking and cycling using a mixed GPS-travel diary approach’ Transportation Research Part A: Policy and Practice.



- 3.2.17 Alongside the Market Street improvements, it is recommended that the area outside of the rail station is improved to provide a sense of arrival for visitors and to encourage visitors to the town by rail. The placemaking scheme at Paignton has been provided as an example in Figure 12 below.

**Figure 12: Carnforth Rail Station**



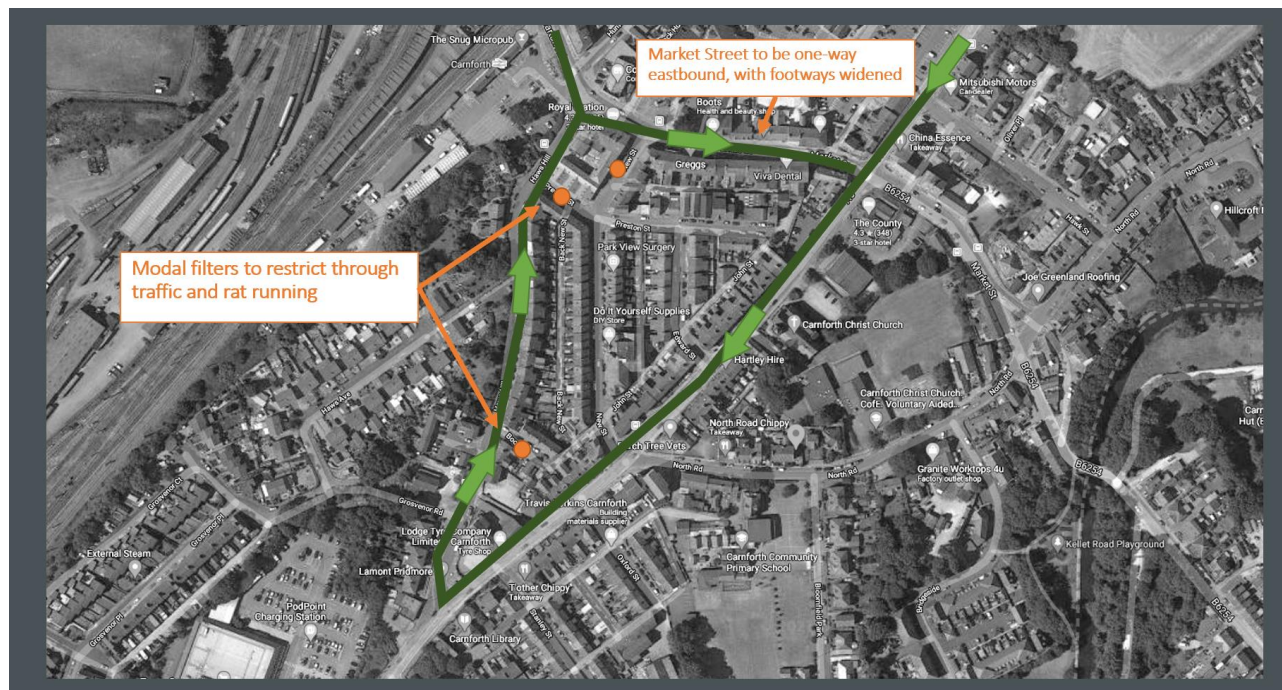
### **Traffic Management within the Town Centre**

- 3.2.18 It is understood that there are aspirations to restrict HGV movements westbound on Market Street, with large vehicles being required to re-route south to the Junction with Haws Hill, before travelling north to re-join Market Street in the vicinity of the rail station.
- 3.2.19 It is considered that there may be the opportunity to explore implementing this restriction to all vehicular traffic. This would result in Market Street becoming one way (eastbound) and would allow for some road space reallocation to provide wider footways, areas of seating or landscaping and for markets – a key aspiration of the neighbourhood plan. This would also help to address the issue of poor air quality which is recognised by its AQMA status.
- 3.2.20 It is noted that Haws Hill currently accommodates a bus route, however any pinch points along this route will need to be investigated further. In the medium to longer term a crossing of the River Keer from Truckhaven across to the Iron Works site could help to reduce the amount of traffic that enters Carnforth travelling towards Warton and Silverdale.

- 3.2.21 Rat running via New Street, Preston Street and Booth Street could be prevented by the installation of modal filters, which restrict vehicular traffic whilst allowing permeability and connectivity for pedestrians, cyclists, and local access. The modal filter on New Street would also change the nature of the road and could provide road space for local businesses or Café's to utilise as multi-functional spaces. The principles of this scheme are indicated at Figure 13.



Figure 13: Traffic Management in Carnforth Town Centre



### Connections to the town centre

- 3.2.22 Market Street, east of the A6 provides a vital connection to both the towpath along the canal and beyond to the school. It is considered that there are opportunities to enhance this link.
- 3.2.23 The Market Street bus stops are located side by side, resulting in a carriageway width of approximately 9.5 metres. By staggering these bus stops, the carriageway could be narrowed to 6.5 metres, and the additional road space reallocated for walking and cycling.
- 3.2.24 It is also considered that there are opportunities to consolidate the Market Street/North Road junction as shown overleaf. By changing the priority of the traffic, the speeds on Market Street would be reduced. This would also provide the opportunity to provide an area for landscaping, and to indicate the arrival into the town from the B6254 and the M6.

Figure 14: Link to the Towpath and to the School



3.2.25 Beyond the North Road junction, this link continues southeast towards the towpath connection. It is noted that the South Carnforth, Draft Development Brief states that the allocated development sites are required to address the following:

*“The creation of a new cycle and pedestrian link between the development sites in South Carnforth and Carnforth town centre, this should include an appropriate pedestrian bridge crossing of the Lancaster Canal at an appropriate and logical point”.*

3.2.26 It is therefore considered that there is an opportunity to enhance the connection along the towpath between the new foot/cycle bridge, and the towards the town centre. Logical crossing points for the new foot/cycle bridge are indicated at Figure 15 overleaf.

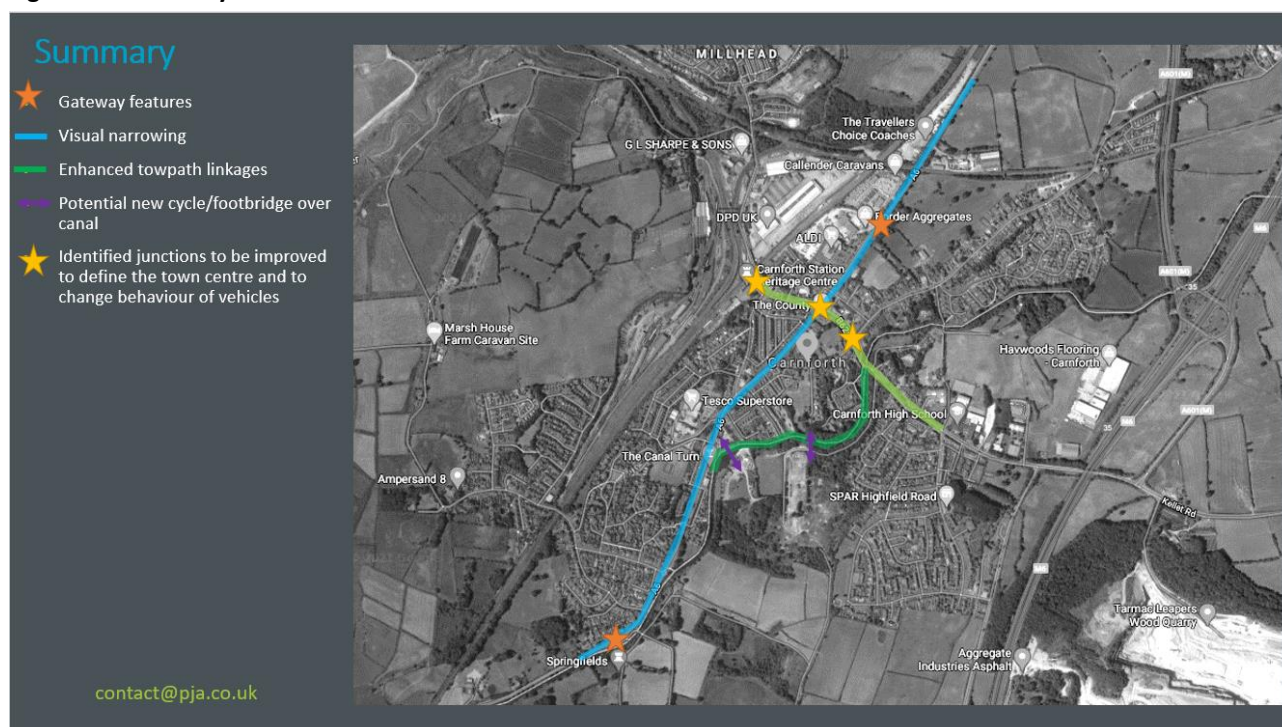


Figure 15: Enhanced Towpath Connections



3.2.27 The towpath connection may be enhanced by low level lighting such as solar lights. This would encourage the use of this link by pedestrians and cyclists all year round.

Figure 16: Summary of Recommendations



## 4 Summary

- 4.1.1 PJA has been commissioned by Manchester University to undertake a research exercise to support Carnforth Town Council Neighbourhood Plan. This note looks to develop technical research around the benefits of introducing walking and cycling measures specifically focused on how design and placemaking can contribute towards better health, social and environmental outcomes.
- 4.1.2 This note has applied the measures to Carnforth and made recommendations where appropriate.
- 4.1.3 The report concludes that there are several interventions that could be introduced to improve the public realm and to enable walking and cycling which should be investigated further as part of a more detailed feasibility report.