Walthamstow Village Review

London Borough of Waltham Forest

PROJECT CENTRE

enjoy WALTHAM FOREST

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EXECUTIVE SUMMARY

Waltham Forest Council is committed to improving the borough's streets and public spaces for everyone, whether you walk, cycle, use public transport or drive.

As part of the £27million investment from Transport for London, we are making a number of changes around the borough to improve our residential areas, upgrade our town centres, and create a high quality network of walking and cycling routes.

The Walthamstow Village area was the first scheme to be delivered as part of the Enjoy Waltham Forest Programme and a wide range of changes were introduced in order to:

- reduce the volume, speed, and noise of traffic outside people's homes
- improve road safety for all users
- make the area easier and safer for people who want to walk and cycle for local journeys, and
- make the area more attractive for residents and visitors.

We recognise that changes of this scale take a while to bed-in and for people to get used to them. As it has now been over a year since the majority of the works were completed we have carried out an extensive review of the scheme to assess the impact and benefits it has had against our objectives.

We have gathered feedback from residents, businesses and visitors to the area, as well as community groups and organisations. We have also analysed a large amount of technical information, such as traffic counts and road safety audits, to produce this report and see how we can refine and improve the scheme further.

The review shows some great successes:

- The interest the local community has shown in the scheme has been remarkable, with over 1,500 people feeding back as part of this review alone.
- The number of residents walking and cycling has increased (page 17), with 28% saying their primary mode of transport for regular journeys is done by walking.
- Traffic counts show that on average the number of vehicles on roads within the Village have decreased by 44% (page 69), and the majority of residents have noticed that traffic speed and noise has either decreased or stayed the same (page 22).
- All of the visitors surveyed had a positive opinion of the overall scheme with 84% stating it was very good (page 51).
- Only 1.7% of residents would scrap the scheme and go back to how it was (page 37).

The review also highlighted areas for improvement, in particular:

- Although traffic speed and noise have decreased in the area, residents are concerned that some roads in the Village, for example Church Lane , vestry Road, East Avenue and Third Avenue have seen an increase in traffic (pages 21 and 69).
- Traffic levels have increased on roads surrounding the Village such as Lea Bridge Road and Hoe Street (page 84).
- Businesses are mostly positive about the appearance of the scheme, but they feel there are issues with the location and number of parking spaces available, and loading provisions for suppliers (page 39).

Throughout the report these successes and areas for improvement are discussed in more detail alongside many others that are not mentioned above. A full list of recommendations is available on page 143.

Thank you to everyone who took part in the review, your feedback is vital in helping us meet the local community's needs, as well as our scheme objectives. Together we can make sure that Waltham Forest keeps changing for the better.

We will continue to speak with the local community and keep them updated on future changes. For more information visit **www.enjoywalthamforest.co.uk.**

Cllr Clyde Loakes
Deputy Leader of Waltham Forest Council

1. INTRODUCTION

1.1 Background – Enjoy Waltham Forest

The London Borough of Waltham Forest was one of three boroughs awarded approximately £27 million from Transport for London (TfL).

As part of the Enjoy Waltham Forest programme we are in the process of making a wide range of improvements around the borough to make our streets suitable for everyone to use, whether you walk, cycle, use public transport or drive.

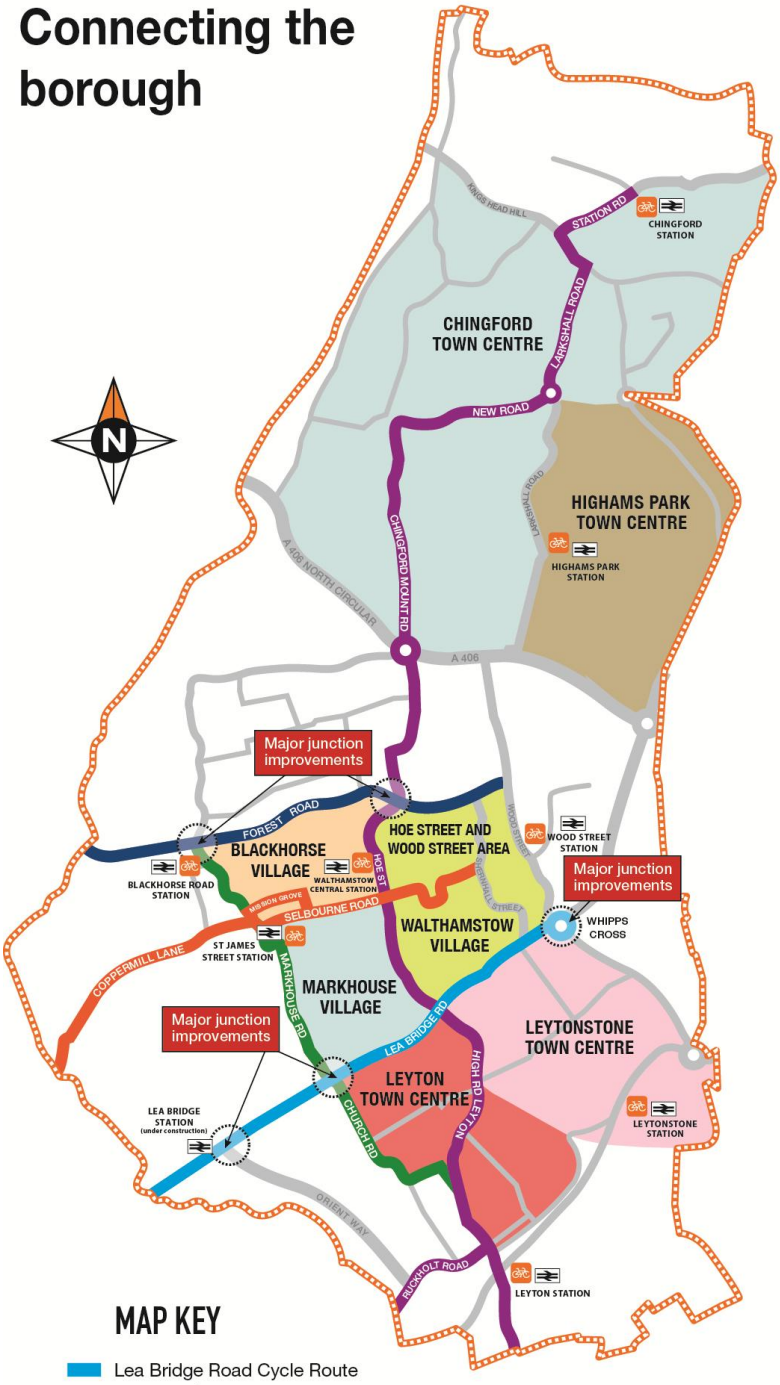
By creating space for cycling, providing routes that better connect the town centres, and redesigning some of our residential and public areas, we can help people get around safely, cut down unnecessary traffic outside homes, and work with businesses so that people want to spend more time in the borough.

The Enjoy Waltham Forest programme is broken down into several main areas:

- **Villages** - Walthamstow Village, Hoe Street and Wood Street area, Blackhorse Village and Markhouse Village
- **Town Centres** - Chingford, Highams Park, Leyton, Walthamstow and Leytonstone
- **A network of cycle routes** - Forest Road, Leyton-Chingford and Leyton-Blackhorse Road
- **Lea Bridge Road -** 'A street for everyone'
- **Cycle parking –** Extensive coverage of cycle parking including resident cycle hangers, cycle hubs at stations, on and off street, and specialised cargo bike spaces
- **Complementary measures -** Residents, businesses and visitors are encouraged to take part in events and activities to discover the benefits of the programme. These activities include cycling training for residents, schools and workplaces, HGV cycle safety training, improved facilities for cyclists and community events.

A NETWORK OF WALKING AND CYCLING ROUTES

Connecting the borough



MAP KEY

- Lea Bridge Road Cycle Route - a street for everyone
- Leyton to Chingford Cycle Route
- Bloomsbury to Walthamstow Quietway
- Leyton to Blackhorse Road Cycle Route
- Forest Road to Wood Street Cycle Route
- Cycle Sheds
- Borough Boundary

1.2 Enjoy Waltham Forest Objectives

While some of the benefits and objectives of this programme will be realised in the short-term, many are long-term goals that will develop as the programme is fully completed and travel behaviour starts to change. The key objectives of the programme are:

1. A network of direct joined up cycle routes
2. Safer streets for walking and cycling
3. More people walking and cycling
4. Better places for everyone – from town centres to local shopping streets to residential areas
5. Better balance between movement and place
6. Address local issues wherever possible
7. Support employment, growth and development – sustainably
8. Support other Council priorities

1.3 Walthamstow Village Scheme overview and aims

Walthamstow Village is the area between Lea Bridge Road, Hoe Street, Liverpool Street – Chingford Overground line and Shernhall Street. The Walthamstow Village scheme has four specific aims, which contribute to the wider objectives of the project. These are:

Aim 1: reduce the volume, speed, and noise of traffic outside people's homes

Aim 2: improve road safety for all users

Aim 3: make the area easier and safer for people who want to walk and cycle for local journeys

Aim 4: Make the Village area more attractive for residents and visitors.

1.4 Scheme development and implementation

To effectively implement the scheme, we introduced a seven-stage delivery plan. A summary of the stages are:

Stage 1: Baseline information gathering

Prior to TfL's announcement of Mini-Holland funding, the area around Pembroke Road had been identified for a neighbourhood improvement scheme in response to historic local concerns and representation. In February 2014, we carried out a survey in the area to understand the main concerns of local residents and businesses. The survey was delivered to 2,228 properties and we received 118 responses, with two of the key issues raised being traffic volumes and speeding on residential roads.

Stage 2: Trial road closures

Information gained from the resident survey and initial traffic survey data collected within the area suggested that a high proportion of vehicles used Walthamstow Village as a cut through between Hoe Street and Lea Bridge Road. To reduce the amount of vehicles cutting through the area while still allowing local access, we put in a series of trial road closures for two weeks, between 26 September and 13 October 2014. This trial allowed us to collect live traffic data in order to consider the impact of the closures and identify further changes for the final scheme. In addition, it enabled residents, businesses and visitors to experience first-hand what it could feel like having the roads closed, and feedback on the design.

The results from the trial showed a large reduction in the number of vehicles cutting through the Village, and a drop in the average speed of vehicles driving in the area. However, the traffic data did show that some roads had turned into new rat runs and saw a significant increase in traffic levels.

Stage 3: Community engagement

Council officers carried out extensive resident surveys, knocking on 4,000 doors to answer residents' questions and get feedback. 1,856 people completed the survey, of which 1,242 were residents in the area. Although some sought improvements, 52% were in favour of the trial, 37% were not in favour, and 11% were neutral.

Stage 4: Development of final proposals for consultation

During October and November 2014, we developed the final proposals for consultation. To develop the design, a number of resident and business engagement workshops were undertaken. This was to study the results of the trial, provide essential feedback, analyse and offer views on the future proposals, and suggest ideas to improve the scheme. 219 residents and 18 businesses attended the workshops, and we received many constructive suggestions on how to improve the scheme and the area.

Stage 5: Public consultation

On 28 November 2014, council officers' hand delivered consultation documents to all residents and businesses in the area. The consultation period ran for three weeks from 28 November to 19 December 2014. During this period, we ran a number of engagement events and met with key stakeholders including the emergency services, schools, resident groups, religious institutions, Dial-a-ride and the Almshouses.

The results showed that 44% were in favour for traffic changes and 41% against, while 74% were in favour of the safer environmental proposals and 13% against.

Stage 6: Implementation

Implementation of the scheme started in April 2015 and completed in September 2015. Following concerns raised by residents and businesses we have made a number of further changes and adjustments since the works were substantially complete, including the construction of the road closures, which started in July 2015. A full list of these changes is in chapter 2.

Stage 7: Review

We carried out a detailed review of the changes; starting approximately a year after the scheme was completed. This report outlines the process and results of that review.

1.5 Regional context and wider initiatives

The previous Mayor's Transport Strategy has a clear approach to addressing congestion and transport in London. There is a focus in the short term to make sure streets operate as efficiently as possible, and a long-term plan to achieve a shift away from car use towards more efficient means of travel. This recognises that with the level of future growth projected in London, and more locally in Waltham Forest, it is not sustainable to continue to try to accommodate an increasing number of vehicles within limited street space and that alternative options need to be found.

The new Mayor's forthcoming transport strategy will focus on a healthy streets approach to help create a vibrant, successful city where people can live active, healthy lives. Their experiences of using the local streets will help residents determine whether to walk, cycle or use public transport, and whether they choose to visit their local high street or drive to an out of town shopping centre.

Waltham Forest Council's policies align with this strategy by encouraging the use of sustainable travel, and improving local streets and air quality via the Waltham Forest Air Quality Action Plan. The Enjoy Waltham Forest Programme fits into both local and London wide policy.

2. REVIEW OVERVIEW

As part of the delivery plan developed in 2014 and outlined in section 1.4, the final stage of the process is to review the scheme 12-18 months after completion. The next few sections set out the scope, objectives, process, outcome and recommendations from the review. We have not carried out a review of this scale in Waltham Forest before, and are not aware of any other Local Authorities who have undertaken a review of this type on a highway/transport project, but we felt it was important to gather as much technical data and feedback from the local community as possible, Analysing all of this data has taken us longer than initially expected but we wanted to make sure the review as comprehensive as possible

2.1 Review scope and objectives

This review only covers measures that are directly associated with the Walthamstow Village scheme, not the wider Enjoy Waltham Forest programme. It includes work carried out within the residential streets between Lea Bridge Road, Hoe Street, Liverpool Street – Chingford Overground line and Shernhall Street between April 2015 and September 2015. A map of these measures is in Appendix 1.

Following implementation of the main scheme, we made a number of further changes to try and resolve some of the concerns raised by residents and businesses. These were:

- Introducing a right-turn ban from Shernhall street into Church Lane during the morning peak traffic period (8am to 9.30am)
- Creating additional short stay parking near Orford Road
- Planting more trees across the area
- Providing Orford Road Traders' Association with their own cargo bike to help support deliveries
- Further improving the Village Square by adding benches, lighting and hanging baskets in discussion with Walthamstow Village Residents' Association and Orford Road Traders' Association.

We are continuing to make improvements in the area by:

- Supporting Walthamstow Village Residents' Association to put in place an event management system for the Village Square
- Working with businesses on a wayfinding (signage) project to promote and support local businesses
- Working with businesses in the wider area to develop a zero-emission delivery scheme.

The review is taking place now as the majority of the scheme has been complete for 12-18 months and the changes have been able to bed in. Therefore, we need to assess the impact of the scheme against the core objectives (outlined in section 1.2) that we agreed with TfL, and the expected benefits we designed the scheme to bring.

The review also aims to gather feedback from residents, businesses and visitors in the area to help identify where further changes to support the core objectives may be required.

As part of the review, we have considered any trends, patterns or consistent views identified in the data. Where appropriate, we have made suggested improvements or changes to the scheme that support the core objectives. This information will also be used to help inform the development of future projects across the borough, and will help TfL assess the benefits of such schemes as they develop their 'Healthy Streets' agenda.

Finally, It should be noted that the review is not a legally required process, and although suggestions and recommendations may be drawn from the review this does not replace the legal Traffic Regulation Order process for scheme implementation.

2.2 Review structure

The first part of this report involves the analysis of a number of data collection surveys, examined in two parts:

- **Chapter 3: Community feedback** – This chapter outlines and analyses the results of various community engagement surveys, providing a detailed account of stakeholder feedback relating to the changes in the area.
- **Chapter 4: Technical data** – This chapter reviews a series of technical data sets, enabling a quantitative analysis of the impact of the scheme on local traffic distribution, road safety and vehicle journey times.

In order to better assess the scheme against the project specific aims, Chapters 5 and 6 provide further analysis:

- **Chapter 5:** This chapter provides a comparison of the technical data and community feedback surveys, and the extent to which the outcomes meet the main aims of the scheme.
- **Chapter 6:** Provides recommendations on the scheme for the future.

2.3 Data collection

During the period of June 2016 to December 2016, an extensive data collection process was undertaken. This was one of the largest data collection processes for a highways scheme review in Waltham Forest. The full extent of the process is outlined in 2.3.1 and 2.3.2.

2.3.1 Community and Stakeholder Feedback Collection Process

An independent external marketing research company collected information from the community, using separate surveys for residents, businesses and on-street visitors.

Resident survey – Resident feedback was collected by an independent external marketing company for impartiality and confidentiality. Face-to-face surveys with households in the Walthamstow Village area took place during September 2016 to October 2016. A card was posted through residents' doors with information on how they could still share their feedback, if they were not at home.

Business feedback – The independent company carried out a face-to-face survey with businesses to find out what impact the changes had on them and what improvements they would like to see.

On-street visitor survey – The independent company carried out a face-to-face survey with pedestrians in the area. This was to find out how people, who are not necessarily local residents, use the area and understand their views on the changes.

Emergency services – As part of our on-going engagement with the emergency services, we met with the three key services to get their formal feedback on the overall scheme, as well as their views on the changes we have already made to the area based on previous feedback. We continue to meet with the Emergency Services regularly.

Community organisations and schools' feedback – We held a number of meetings with local schools and other key community organisations in the area, such as places of worship, to find out how they have found the scheme since its implementation. Local campiagn groups, Waltham Forest Cycling Campaign and E17 Streets 4 All, have been involved in discussions through the review process.

2.3.2 Technical data collection

Traffic counts – In June/July 2016, we installed 33 traffic counters on roads in and around the scheme area to compare them with levels collected before and during the trial in 2014. The original data collected before and during the trial was focused on 12 key roads, outlined in the February 2015 Cabinet report, however, data was collected on several other roads in the area before/during the trial but was not included in the analysis at the time. The new traffic counters are located as close as possible to the ones we located in the 2014 survey.

Road Safety Audits on the road changes – An independent company, using the standards set by the Department of Transport and TfL, carried out the Road Safety Audits. They visited sites after the scheme was in place to check if any safety issues have arisen from the road layout changes.

Collision analysis – We have gathered information from TfL and the Metropolitan Police on the number and severity of collisions in the area, and on the boundary roads before and after implementing the scheme. The industry standard is to compare data three years before and three years after, but due to the timing of this review, it was only possible to analyse collision data for 11 months after implementing the scheme.

Cycling counts – We have recorded information on cycling numbers from the traffic counts undertaken in September 2014 and June/July 2016. In addition, a number of permanent cycle counters were placed on key roads and information taken from these for comparison.

Analysis of the walking and cycling network - We have reviewed how the changes have helped create a high quality cycling and walking network in the area. This involved undertaking a number of assessments on junction safety and area porosity using the assessment criteria outlined in TfL's 'London Cycling Design Standards 2'.

2.4 Data – limitations

While we have made every effort to undertake an extensive review and obtain representative information from residents, businesses, and visitors - as with all data collection exercises there are limitations. These limitations can be financial, technological, or due to time constraints. We have identified and examined the limitations in our data and collection methods to ensure transparency and to get a clear understanding of the results that we find.

- The aims of this scheme and the Enjoy Waltham Forest programme vary with short and long-term timescales. The Walthamstow Village scheme was implemented over a year ago and although this provides reasonable feedback on the short-term objectives, in the longer term as residents, businesses and visitors get used to these and the wider scheme changes there are likely to be different patterns and results. Therefore, this review gives a snapshot of the current results but these will inevitably change over time.
- We have undertaken an extensive data gathering exercise across the Village and main roads, outlined in this report. A key point of focus was to understand vehicle flows on individual roads as reducing these numbers could have a large impact on quality of life for local residents. Therefore, vehicle counts on roads within the Village allow us to be able to do this and check to see if we have met Aim 1.
- However, this does not give a full analysis of every journey and every driver's travel behaviour before and after implementing the scheme. To do this would have required vehicle tracking at each entry and exit point to the Village area as well as every junction within it and on the wider road network. This would have been

impractical due to the sheer size of data collected and would have probably cost more than the physical changes themselves.

The extensive surveys which have been done allow us to identify trends and patterns in traffic volumes on a wide network of roads, to which assumptions can be made on travel behaviour, and assessments made on impacts to the wider area. In order to fill this limitation we have gathered information from TfL such as bus journey times on the main roads.

- As part of the review, an independent survey company carried out resident surveys to get an open reflection of people's views. The Walthamstow Village scheme has developed and changed from start to finish, and we wanted feedback on many things. However, we are also aware that the number of questions in the survey had to be limited to keep to a suitable timeframe.

2.5 Core aims and data collection

The review is structured as an assessment against its core objectives. The table below outlines the data collection method we have used to make this assessment.

Aim	Data collection method
Aim 1 **Reduce rat-running and vehicle noise**	<u>Community feedback</u> Resident survey – results from questions on methods of transport, change in vehicle usage and walking, views on change in traffic volume, noise and speed. Visitor survey – questions related to changes in mode of transport used to get to the area. <u>Technical data</u> Traffic counts, mean vehicle speeds, 85%ile speeds (see page 76), traffic distribution and bus journey times.
Aim 2 **Improve road safety**	<u>Community feedback</u> Resident survey – results from questions on street lighting. Visitor survey - feedback on impressions of the scheme. <u>Technical data</u> Traffic counts, mean vehicle speeds, 85%ile speeds, junction safety assessments, collision data, road safety audit, pedestrian and cycle safety at blended 'Copenhagen' crossings.

Aim 3 Make it easier for people to walk and cycle around Walthamstow Village	<u>Community feedback</u> Resident survey – results from questions on vehicle ownership, change in journey quality, change in vehicle usage and walking / mode of transport. Visitor survey - feedback on transport methods. <u>Technical data</u> Bicycle counts, pedestrian and cycle safety at blended 'Copenhagen' crossings.
Aim 4 Make the Village area more attractive for residents and visitors	<u>Community feedback</u> Resident survey – results from questions on the number of visits to Orford Road, changes to Orford Road and public spaces, and overall perception of changes. Business survey - feedback on the design and layout of the scheme, how/if businesses have been affected, the number of customers/visitors, parking facilities and overall opinion. Visitor survey - feedback on parking, number of visits to the area and impressions of the scheme. <u>Technical data</u> Bicycle counts.

Table 1: Core project aims

3. COMMUNITY FEEDBACK

3.1 Resident survey

An independent external marketing company carried out resident surveys during September 2016 and October 2016. Overall, 1,389 households took part, which represents 34% of the residential addresses in the area. The targeted response rate to ensure a statistical fair representation was 880 responses, or 22% of households in the area. The number of respondents is in excess of this, so this is fair representation of residents within the Village area. In comparison, the Waltham Forest local election turnout in 2012 was 37.6% and 43.9% in 2016.

The review and analysis of the survey are in this chapter, however, the full results of the community survey are included in the accompanying report by Breaking Blue.

3.1.1 Methods of transport

Residents answered a number of questions about their travel patterns. Although the information helps to review all aims, section 3.1.1 focuses mainly on Aim 3 - Making it easier for people to walk and cycle.

Figure 1 shows that from those responding to the survey 43% of households within the Village do not own a car and rely on other modes of transport to travel. Interestingly, the 2011 census data for the Hoe Street Ward had 54% of households not owning a car, which is significantly higher than the response to our survey. However, we do believe the survey response is representative of the area as a whole.

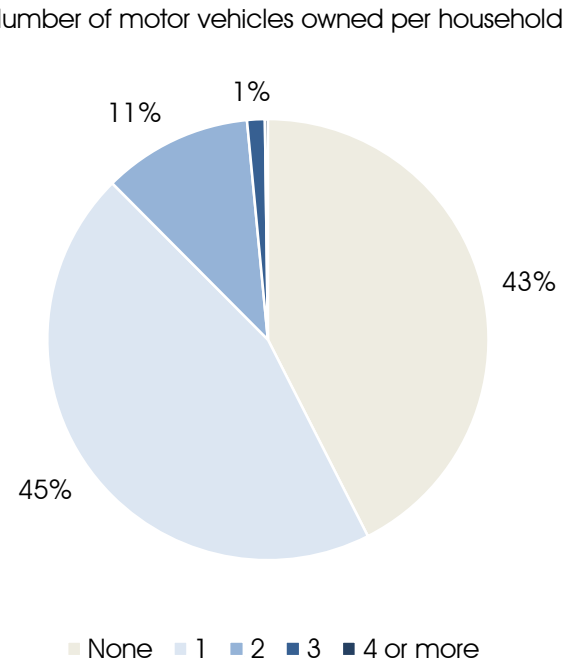


Figure 1: Residential motor vehicle ownership

In addition, Figure 2 shows that 29% of households within the area own at least one bike.

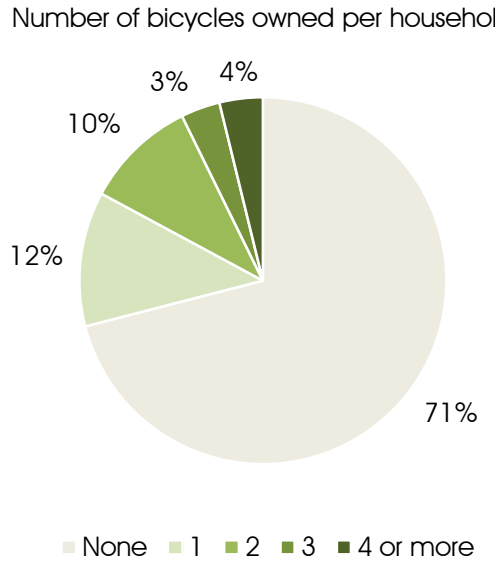


Figure 2: Number of bicycles owned per household

The survey results demonstrate the wide mix of transport modes used by residents for their most regular journeys as shown in Figure 3 and justifies the need to address user issues across all modes of transport.

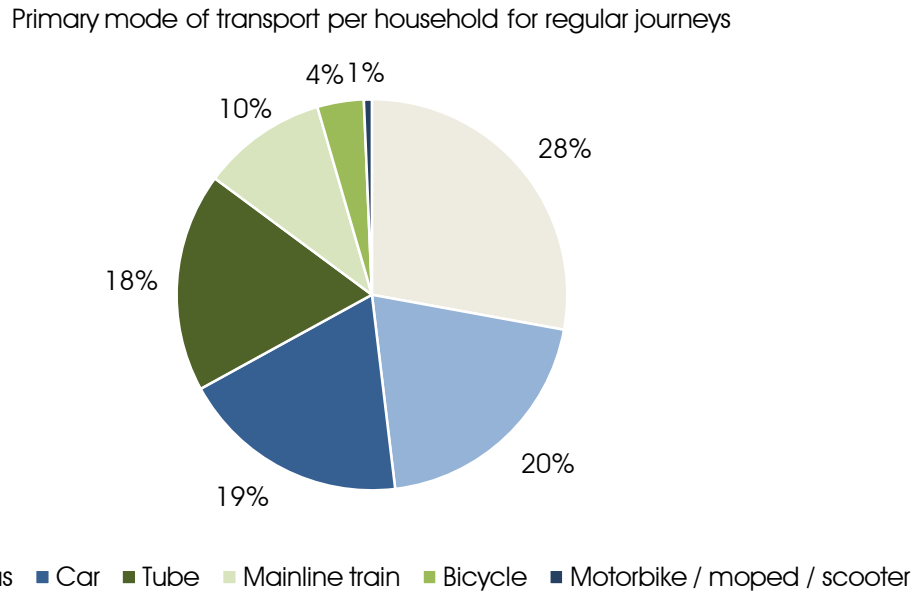


Figure 3: Primary mode of transport per household for regular journeys

Although 57% of households surveyed own a car, only 19% see this as their primary mode of transport with the most popular mode of primary travel being walking at 28%. Cycling was lower, with only 4% saying this was their primary mode of transport.

Aim 3 is to encourage walking and cycling and make it easier. The results show that at present walking is the most common mode of regular transport, and cycling one of the least common. Interestingly, in Waltham Forest Council's 2016 Resident Insight Survey 17% of residents said that they cycle yet in the Village, despite 29% of households owning bicycles, only 4% said that cycling was their primary mode of transport. Understanding the reasons behind this will help achieve Aim 3. One of the reasons for the high level of cycle ownership and yet low level of regular journeys could be that users cycle primarily for leisure purposes or are unsure of cycling outside the comfort area of their local surroundings for longer trips such as work journeys. This is one of the reasons why the Enjoy Waltham Forest programme focuses on key routes in the borough as well as residential areas.

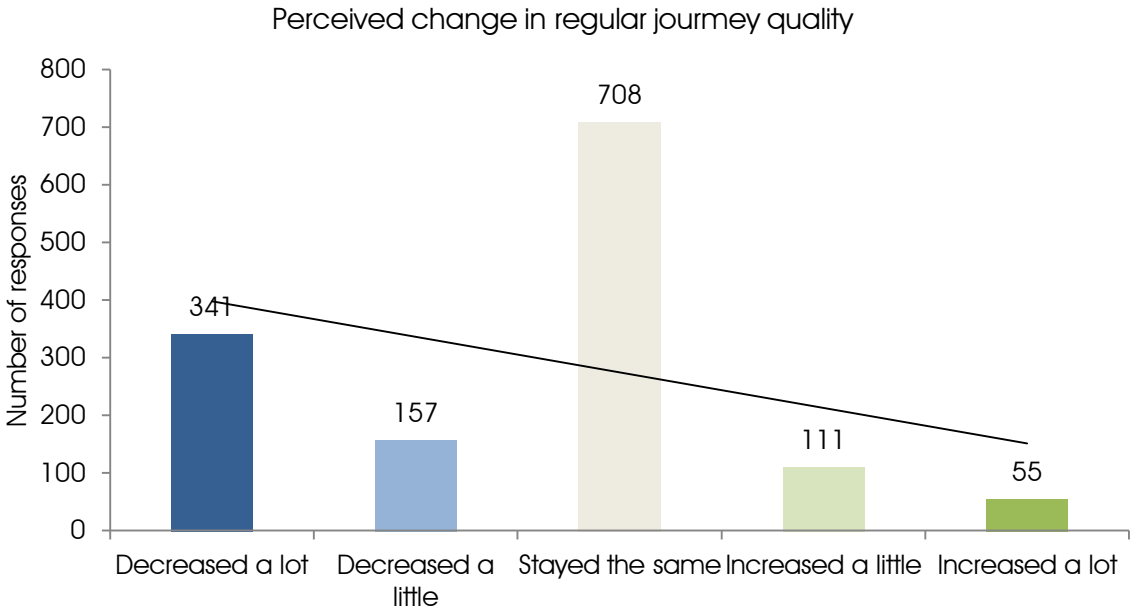


Figure 4: Residents' suggested change in regular journey quality

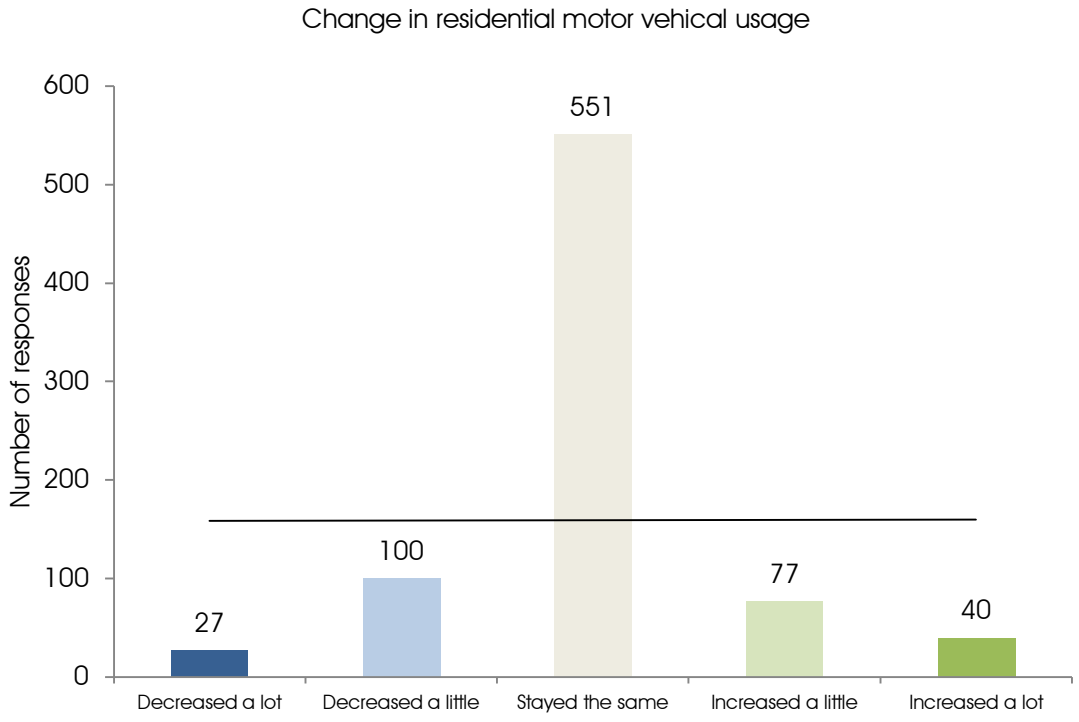
Figure 4 shows that approximately 64% of respondents felt the quality of their journey had stayed the same or improved. Approximately 36% of users said their journey had decreased in quality.

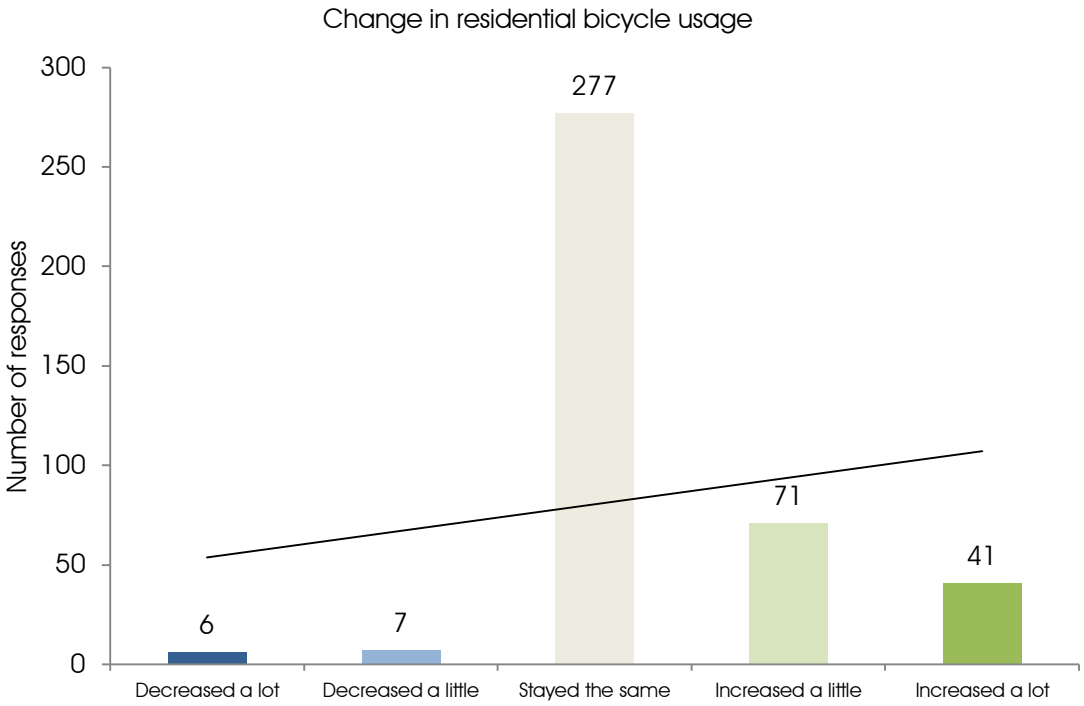
Quality could mean different things to different people and the survey did not include specific follow up questions as to why residents felt this way, so the reasons for residents feeling their journeys had become worse is not completely clear. It is likely that the reasons will be similar to those shown in Figure 11, where respondents who said their perception of their street had decreased told us why they felt this way, the highest responses being lots of traffic and increased journey time.

Residents were also asked if, since the implementation of the scheme, their main mode of travel had changed. The three graphs forming Figure 5 show the number of responses in each category. The graphs show there is a clear net increase in travel behaviour towards

the number of trips being undertaken by bicycle and walking. This includes a 28% increase in the level of cycling trips and 19% increase in walking trips.

The number of resident trips taken by car is relatively static.





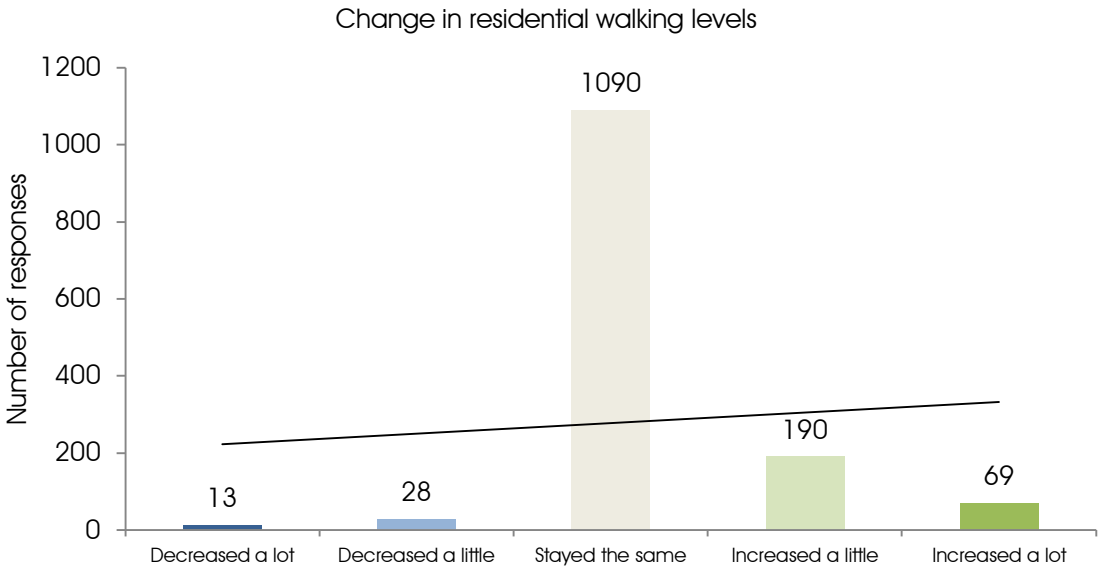


Figure 5: Comparison of survey responses relating to changes in residential vehicle, bicycle and walking usage

Summary

- Walking is the biggest single mode of transport for regular journeys at 28%
- 43% of respondents who live in the Village area said they do not own a car and instead rely on other modes of transport to travel. Interestingly, the 2011 census data for the Hoe Street Ward had 54% of households not owning a car, which is significantly higher than the response to our survey. However, we do believe the survey response is representative of the area as a whole.
- Cycling is currently a low choice of transport for regular journeys, even though there is high ownership among respondents. Although the figures may be low, the data shows that bicycle journeys have actually seen the largest percentage increase at 28%.
- Just over 60% of residents said the quality of their journey has either improved or not been affected by the scheme. Nearly 40% said the quality of their journey has decreased but we did not ask explicit questions why. It is likely that the reasons will be similar to those shown in Figure 11 where respondents who said their perception had decreased told us why, the highest responses being lots of traffic and increased journey time.

3.1.2 Traffic changes

Residents answered questions on how they perceive traffic volume and speed associated noise levels on their street since the introduction of the scheme. This section focuses mainly on Aim 1: to reduce rat-running traffic, noise and pollution outside people's homes within the Walthamstow Village area.

Figure 6 to Figure 8 show residents' perception on whether traffic volumes, speed and noise had increased or decreased since the introduction of the scheme on their street.

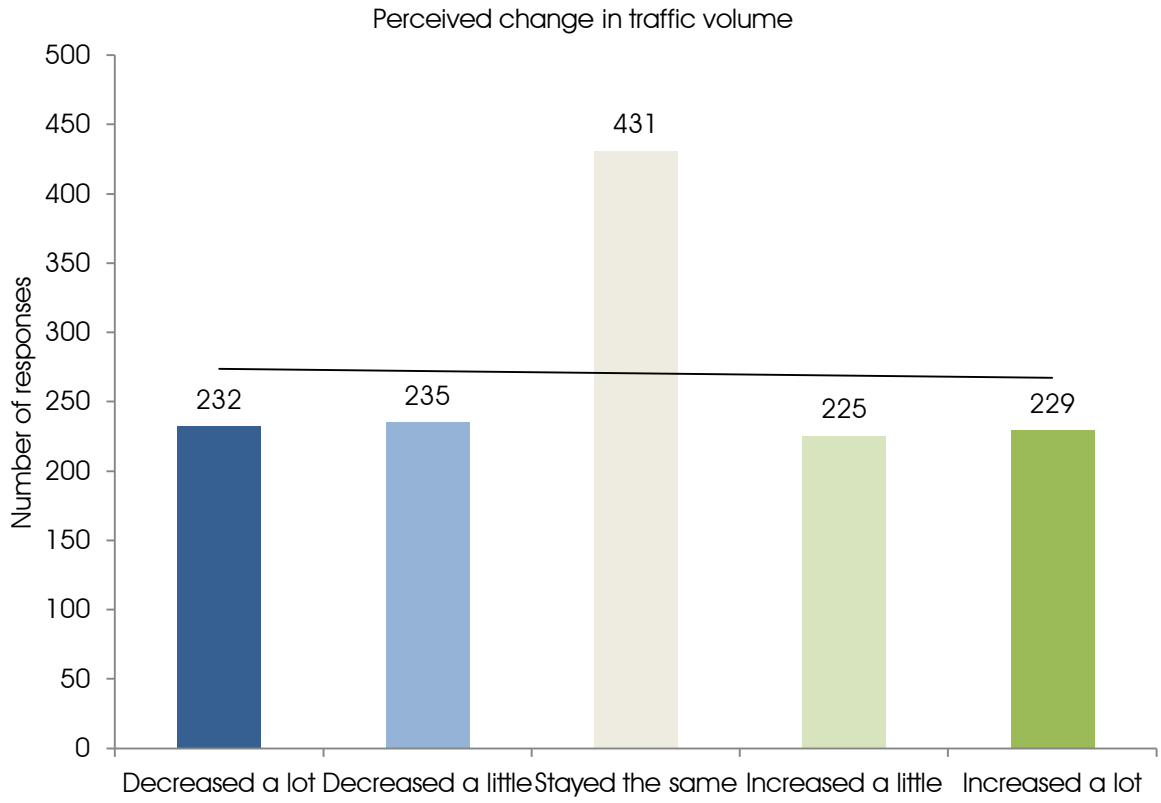


Figure 6: Perceived change in traffic volume

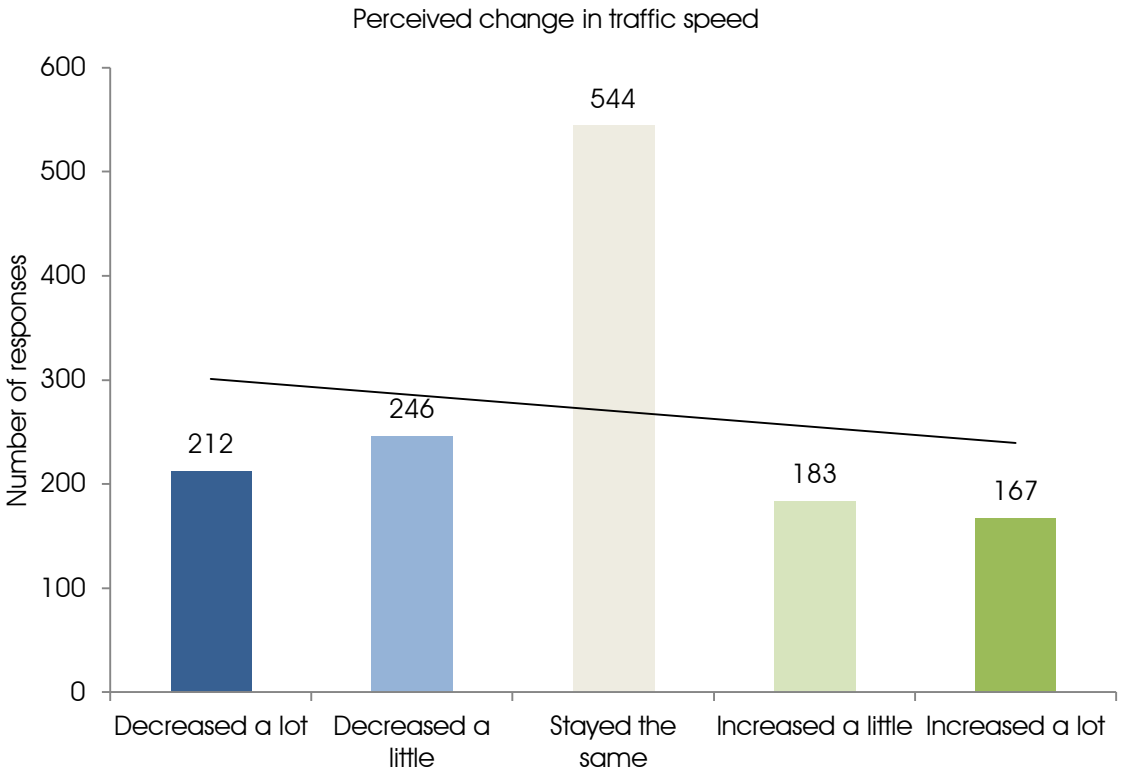


Figure 7: Perceived change in traffic speed

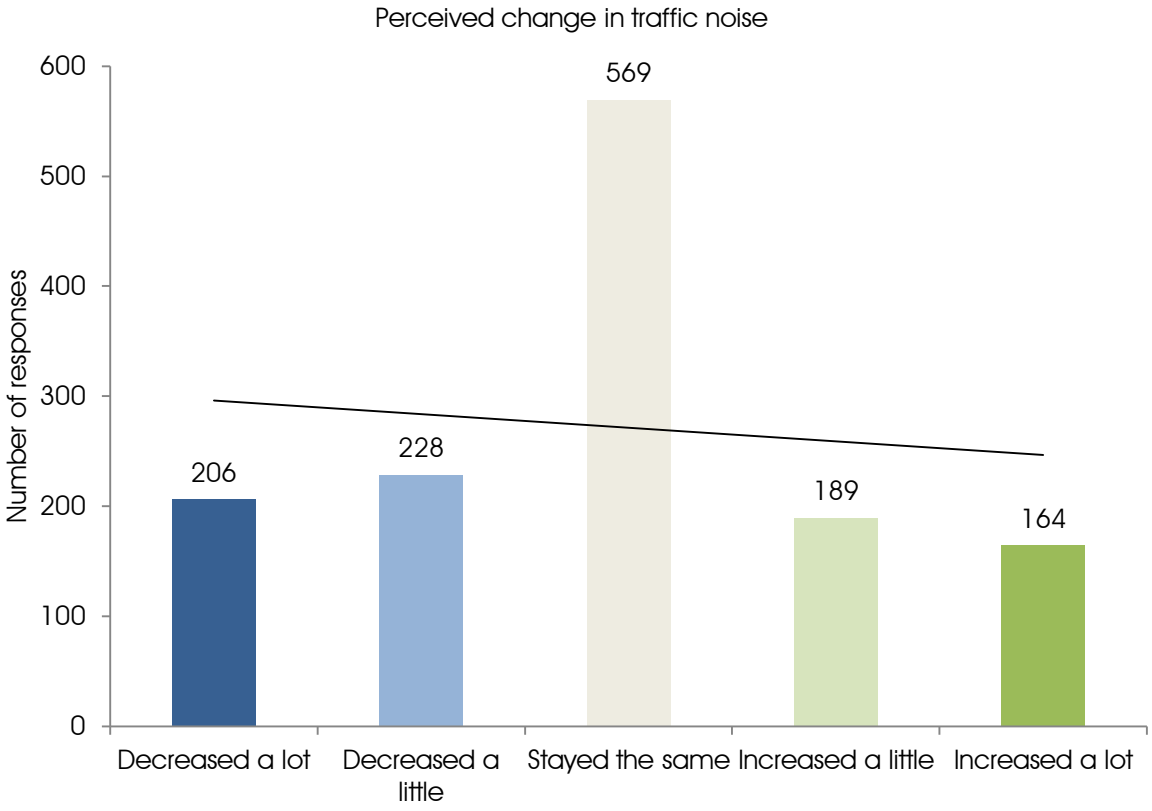


Figure 8: Perceived change in traffic noise

Figure 6 to Figure 8 suggest that on average, residents felt that the volume of traffic on their street had roughly remained the same, but they perceived that traffic speed and noise had decreased. While a perceived reduction in traffic speed and noise are positive factors towards acheiving the aims of the scheme, the mixed opinion on traffic volumes is slightly disappointing and suggests that residents' perceive the scheme has been more effective at reducing traffic on some streets than others. Further comparison of street-by-street changes in traffic volume based on recorded traffic count data can be found in Chapter 4.

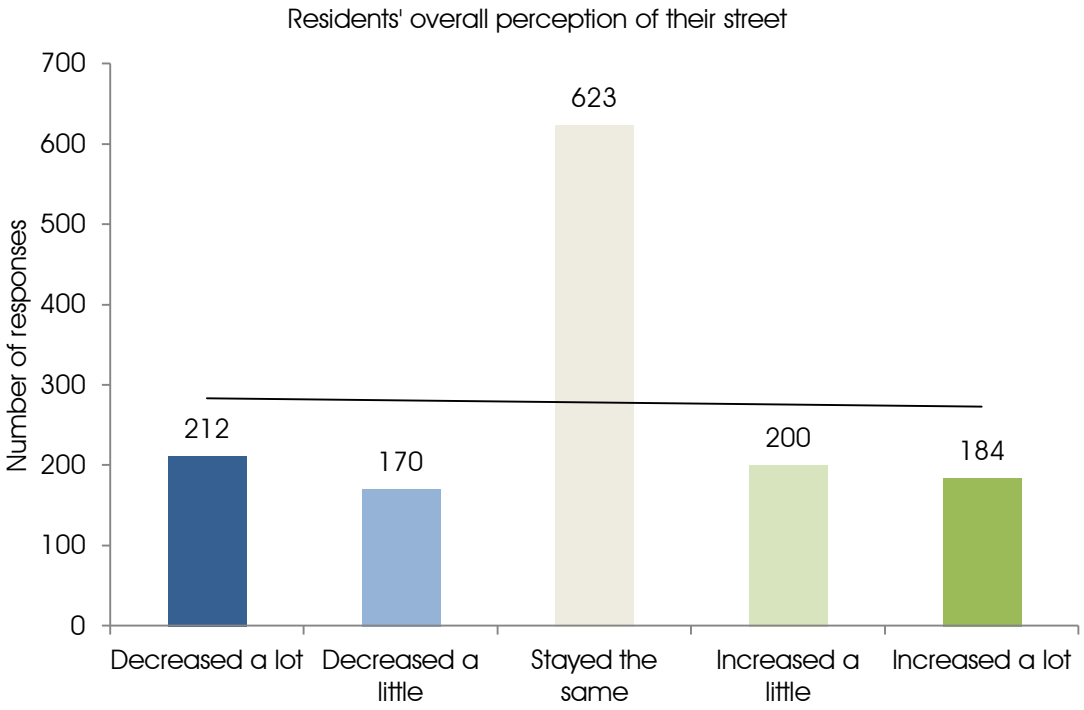


Figure 9: Residents' overall perception of their street

Figure 9 shows that 45% of residents' perception of their street has stayed the same since the introduction of the scheme, whilst 28% said their perception had increased. Figure 10 shows the main factors of why perception has increased, which include reduced traffic, reduced noise or a general feeling of safety. A similar number said their perception of their street had decreased, the main factors why being shown in Figure 11.

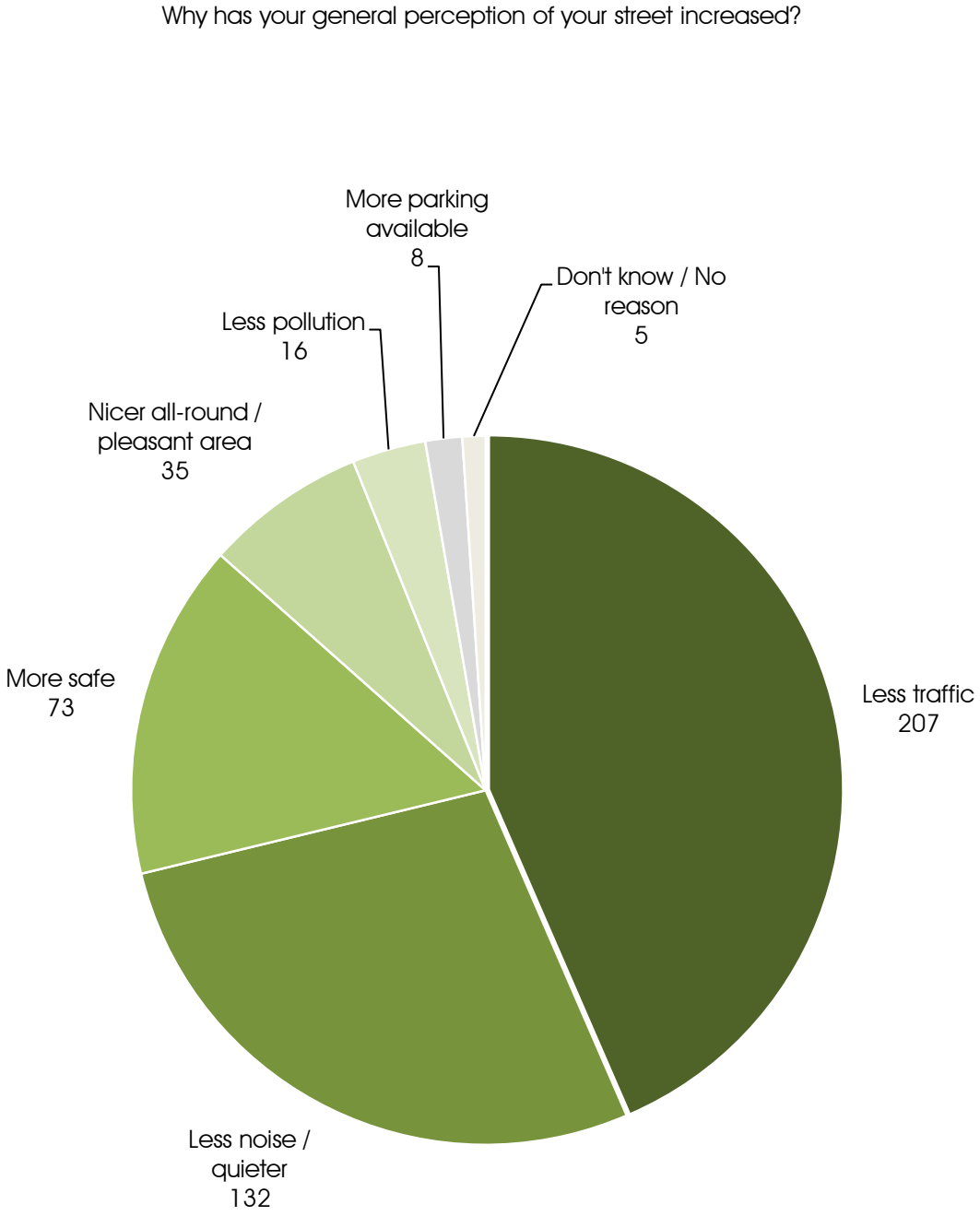


Figure 10: Reasons why residents felt the quality of their streets had increased (384 residents suggested increases, Question allowed multiple responses)

Just over a quarter of residents surveyed said their perception of their street had lowered as a result of the scheme, with 208 residents suggesting too much traffic was the main contributing factor. Figure 11 shows the main reasons for decreased perception, this includes reductions in parking, increased journey times, road closures and noise.

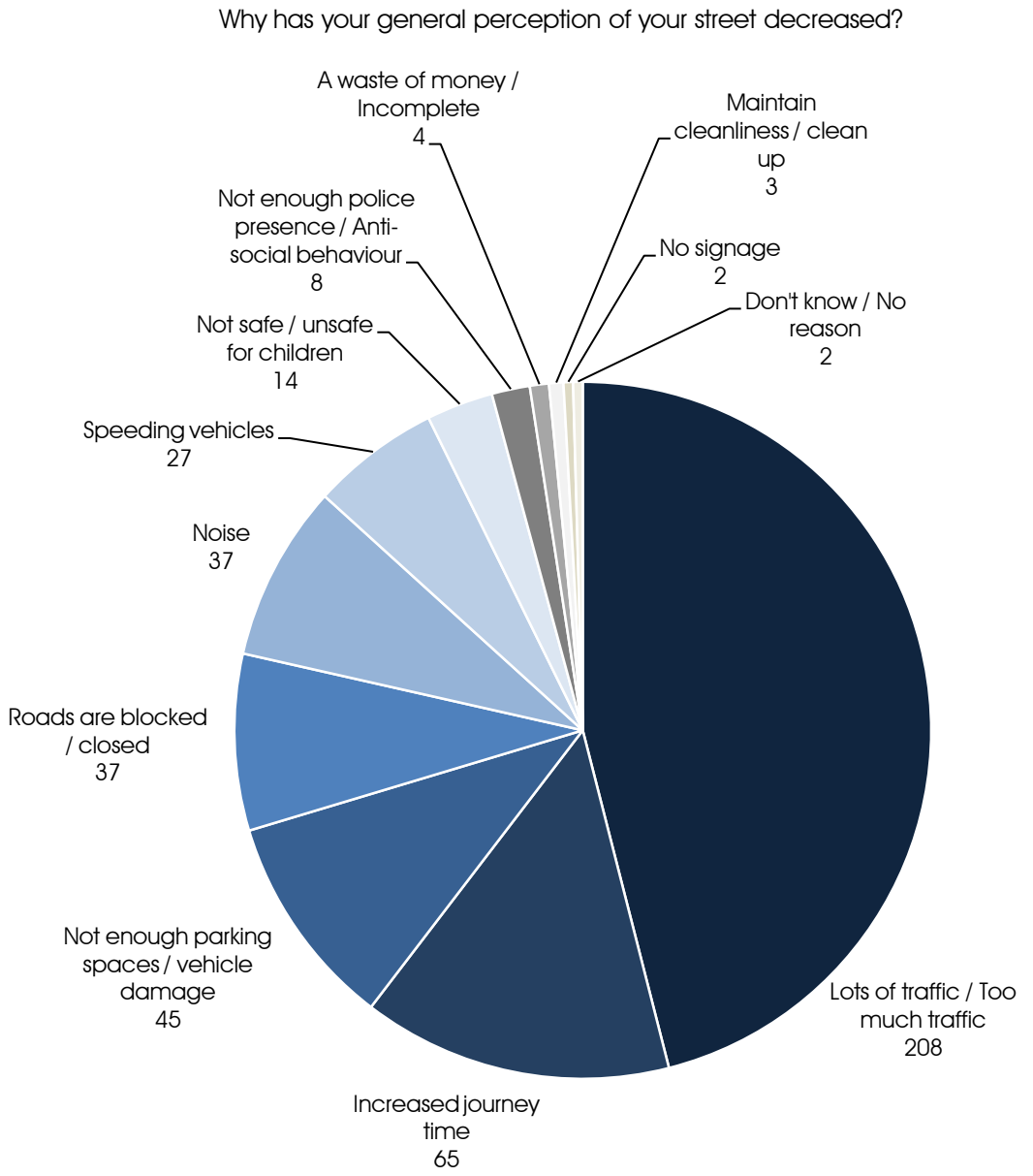


Figure 11: Reasons why residents felt the quality of their streets had decreased (382 residents suggested decreases, Question allowed multiple responses)

Considering both the positive and negative reasons that influence residents' perception of their street, this clearly demonstrates the impact and importance of road traffic on residents' views. From all of the reasons provided, 66% related to traffic and parking. This shows that traffic and vehicles are a major influencing factor in our lives, and the importance of getting the aims of the schemes and the wider Enjoy Waltham Forest Programme right.

Summary

- Respondents felt there has been a reduction in traffic speed and noise
- There was a mixed response to traffic volumes with similar numbers saying there was no change (31.9%), 34.5% seeing a decrease, and 33.6% seeing an increase
- 45% of residents' overall perception of their street has stayed the same. Of the remaining 55% there was a 50/50 spilt in respondents suggesting the perception of their street had increased, and those saying it had decreased
- It would appear that the level of traffic on a resident's street is the main influencing factor in determining their overall perception of their street. In Chapter 4, we look at the technical data measuring traffic volume and noise.

3.1.3 Orford Road area

To determine the success of the changes to Orford Road residents were asked a series of questions about their most recent visit to the area and how they travelled there. This relates to Aim 4: Making the Village more attractive for residents and visitors as well as Aim 3: Making it easier for people to walk and cycle.

Figure 12 shows that the frequency of visits to Orford Road for residents who live in the Village is, in general, high with 64% of residents saying they had visited the area within the last week.

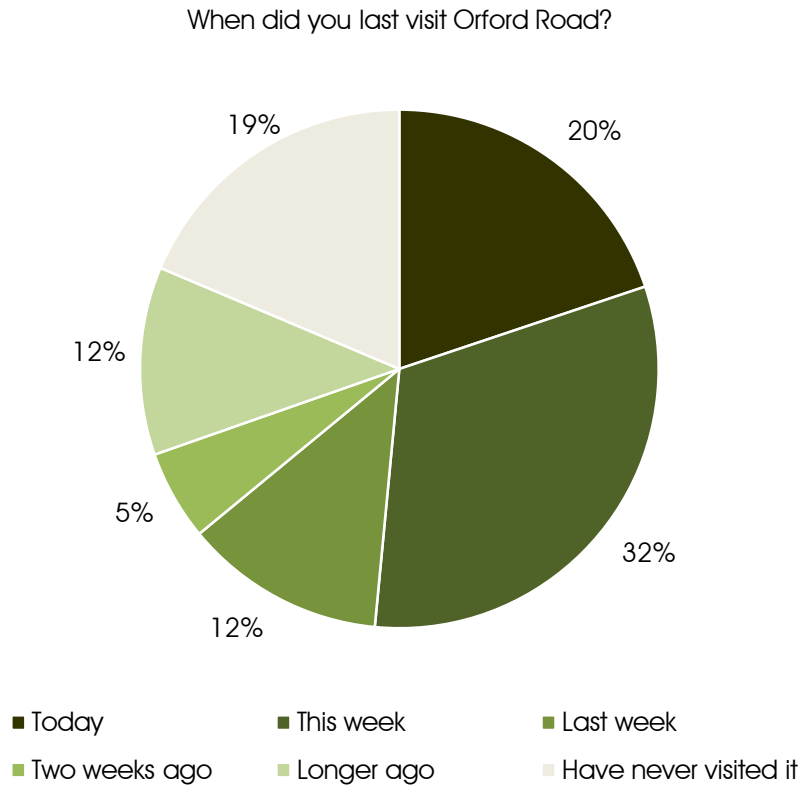


Figure 12: Frequency of visits to Orford Road

Figure 13 shows that 91% of the most recent resident trips to Orford Road were by walking and only 5% by car. Walking is clearly the primary mode of transport for local trips to Orford Road, with nearly as many trips by bike as by car.

This would appear to support the view that the Village area has been made better for walking and cycling

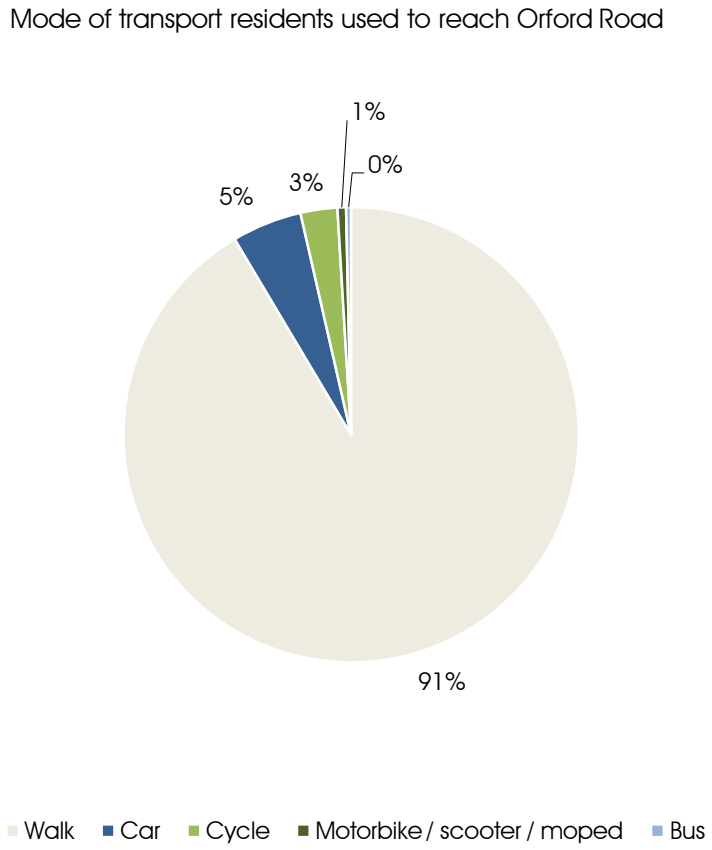


Figure 13: Mode of transport residents used to reach Orford Road

Residents were asked about the changes made to Orford Road and whether this had influenced how frequently they visit the area.

Over 75% of residents said the number of times they visited Orford Road had stayed the same. However, 15.5% said their trips to Orford Road shops have increased because of the scheme, compared to 8% who said they visited less frequently (Figure 14).

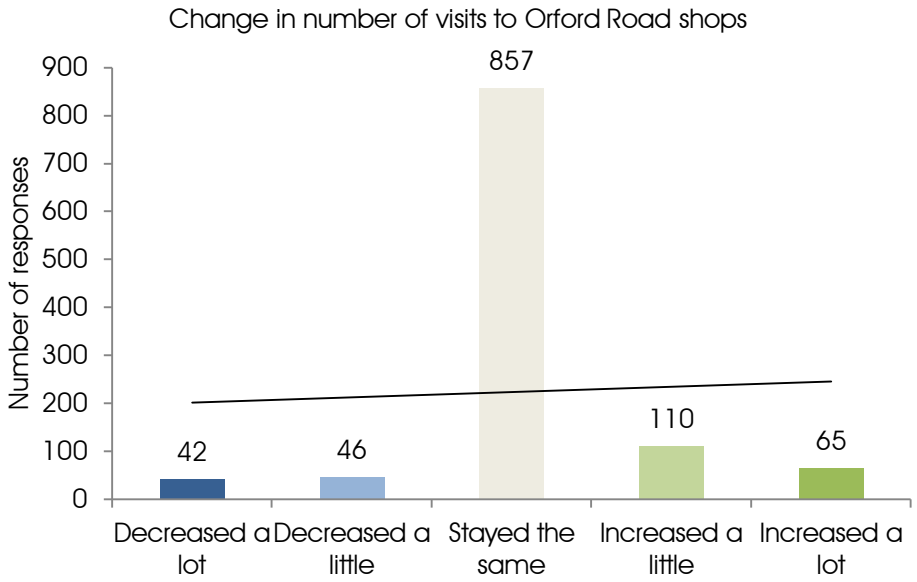


Figure 14: Change in number of visits to Orford Road shops

One hundred and seventy five (175) households said their number of visits to Orford Road had increased because the area is now more pleasant or nicer to visit, there are more or better shops and restaurants, more space for pedestrians, a more sociable atmosphere and increased pedestrian safety, especially for children. This suggests a positive shift towards more people walking in the area for local trips.

When asked about their feelings towards the changes to public spaces in the area, only 18% said they were not happy with the changes to Orford Road/ Eden Square. There was a similarly positive response to the other public spaces within the Village area.

Eighty-eight households said their number of trips to Orford Road shops had decreased, with the majority of those stating the new road closures or lack of parking were the reasons. This would imply that these trips were taken by car previously and we acknowledge that motor journeys within the area may now take longer, although all locations are still accessible. The primary aim of the scheme however is to encourage shorter local trips by cycling and walking instead of using vehicles.

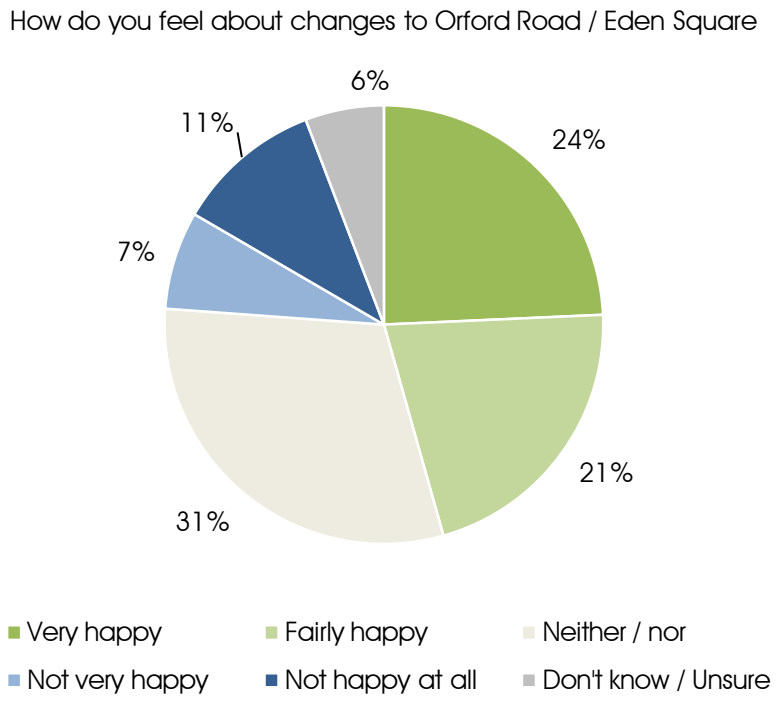


Figure 15a: Comparison of residents views towards Orford Road and other public space changes in the area

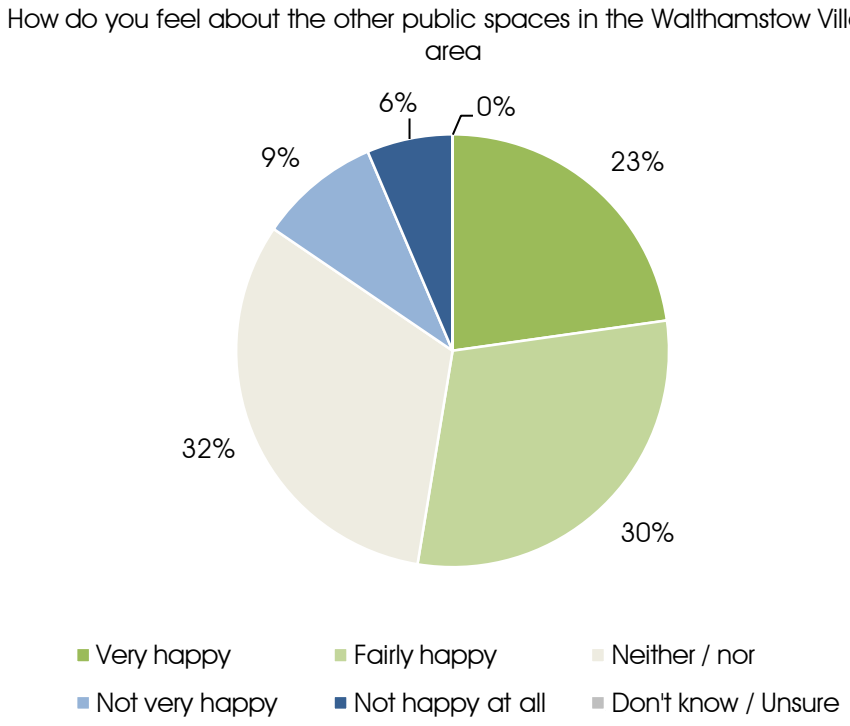


Figure 16b: Comparison of residents views towards Orford Road and other public space changes in the area

Summary

- Overall there has been a positive response from residents to the changes in the Orford Road area.
- Many residents suggested they visit the area frequently and their primary method of travel was walking with 91% having walked there for their most recent journey.
- One hundred and seventy five households said they had increased their trips to the Orford Road area since the introduction of the scheme. Reasons included that the scheme has created a nicer environment for pedestrians, the area is more pleasant, there is more space to walk, there are better shops and restaurants, and it is a more social area with a better atmosphere.
- The number of residents who said they visit the Orford Road area less frequently was low. Of these, the main reasons were relevant to residents using motor vehicles for their trip, for example, road closures and parking restrictions.

3.1.4 Street lighting

The next set of questions within the resident survey were about the changes to street lighting across the whole of the Village area from an orange light to a brighter white light. This change aimed to increase safety in the area at night, thus contributing towards Aim 2: Improve road safety on the roads within the area and Aim 3: Make it easier for people to walk and cycle around Walthamstow Village.

Residents were asked if they had noticed the street lighting change and to what extent they agreed with the following statements:

- "My street feels safer at night"
- "I can see where I am going in the dark much better than before"
- "I am more likely to go out after dark"
- "The lights are too bright".

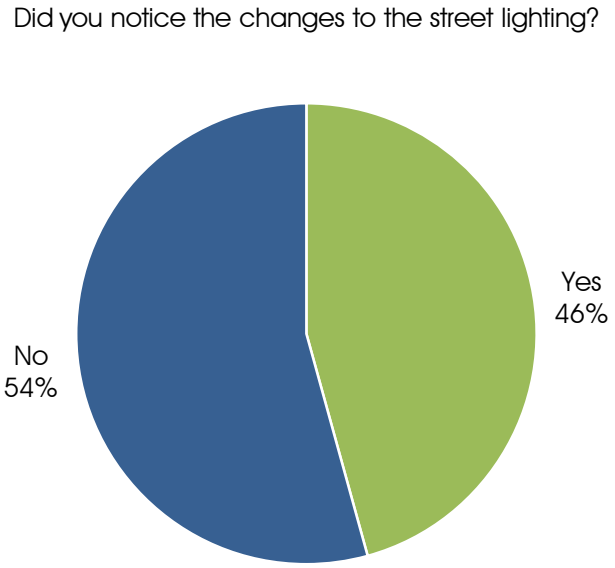


Figure 17: Did you notice the changes to the street lighting

Figure 17 shows that 46% of residents said they had noticed the changes to street lighting.

Figure 18 shows the majority of residents agree that the streets feel safer at night and that they can see better at night than before. Only a small minority of residents felt that the lighting was too bright.

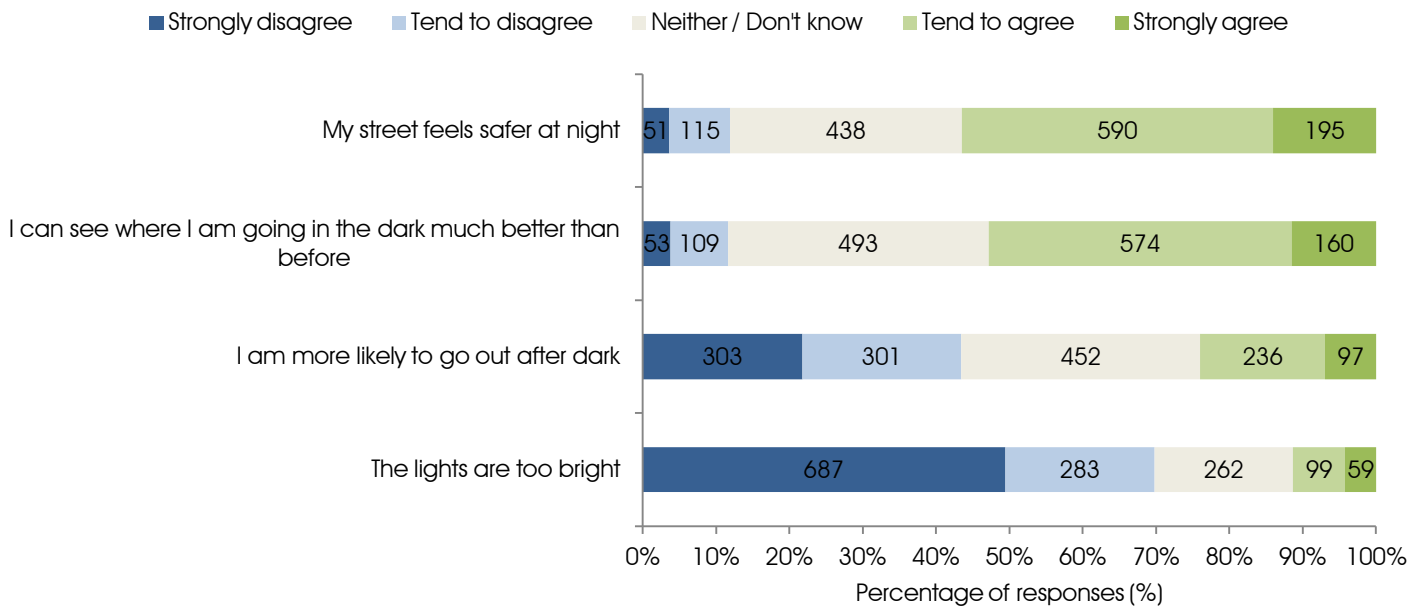


Figure 18: Comparison of residents' responses to the street lighting statements

Summary

- The change from orange lights to white lights was not noticed by the majority of residents, yet many suggested that the streets felt safer at night and that visibility had improved. This suggests the implementation of bright white street lighting has been successful. Only a small minority of residents felt that the lighting was too bright.

3.1.5 Residents' overall perception of the scheme

Residents were asked how they feel towards the overall appearance of the local area since the introduction of the scheme. The results will help measure the success of Aim 4: Make the Village area more attractive for residents and visitors.

Figure 19 shows that the overall response was positive with 55% of residents saying they were either very happy or fairly happy with the appearance of the scheme.

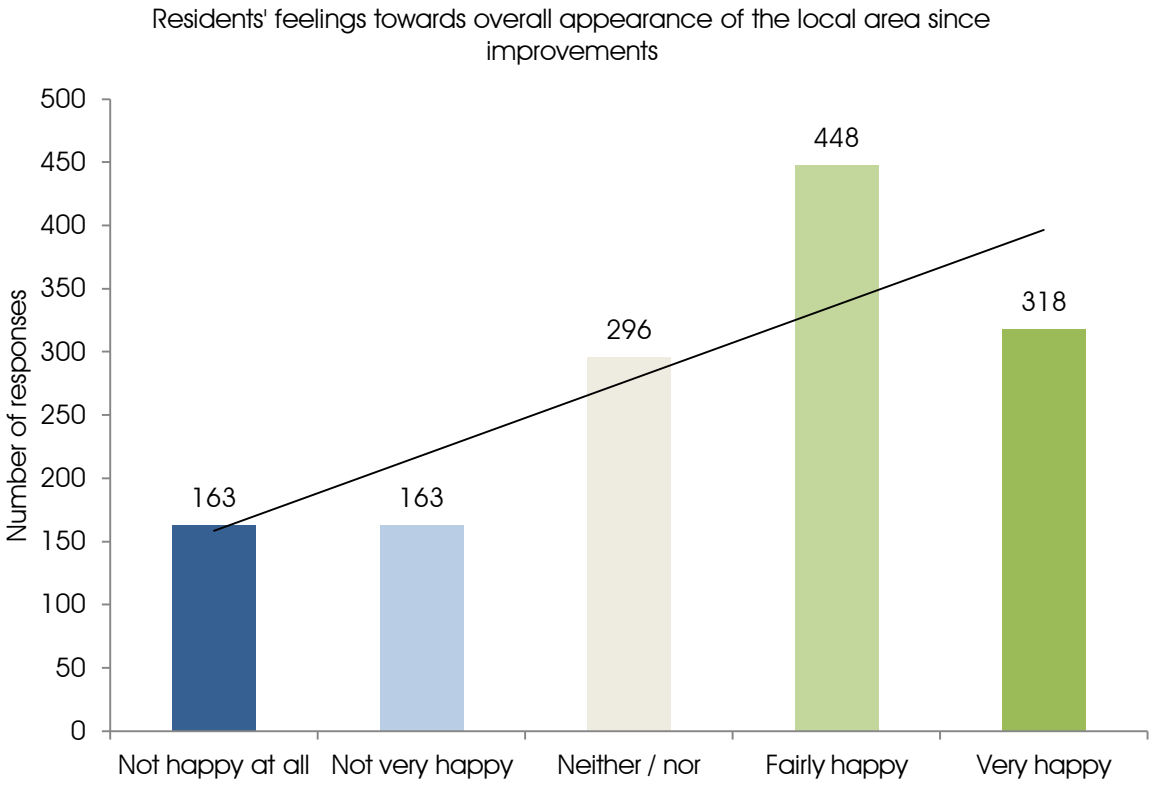


Figure 19: Residents' feelings towards overall appearance of the local area since improvements

To gauge the comparative success of the different elements of the scheme, residents were asked which parts brought the highest benefit to the area, and which they perceived to have lowest benefit.

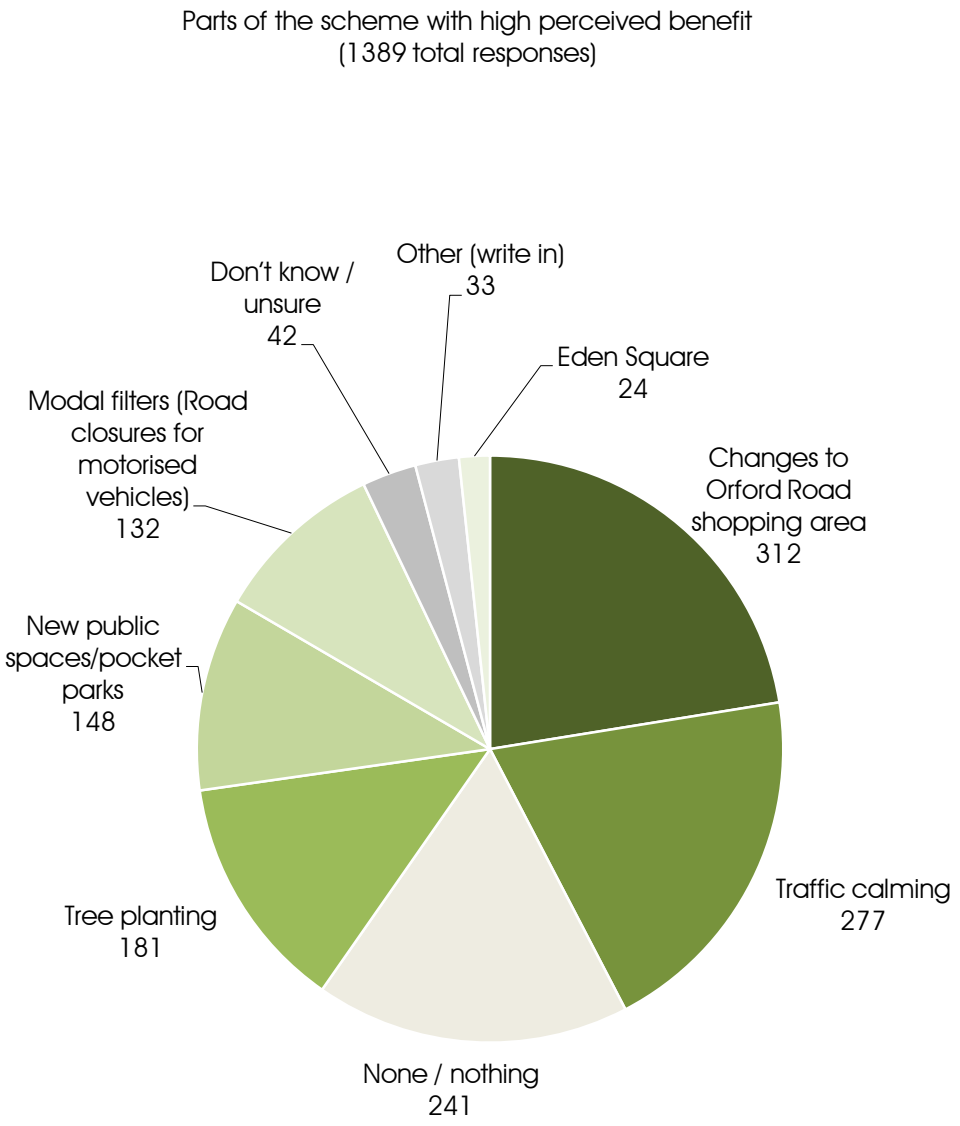


Figure 20: Parts of the scheme with high-perceived benefit

As shown in Figure 19, the part of the scheme which provided the highest benefit included the changes to the Orford Road shopping area and the traffic calming measures. This provides an indication that the changes in Orford Road have been successful in creating an environment in which people want to visit and stay. The high perceived benefit of the traffic calming features shows the concern residents had before the scheme on vehicle speeds and road safety. Tree planting and Pocket parks were also believed to provide high benefit to the area for residents.

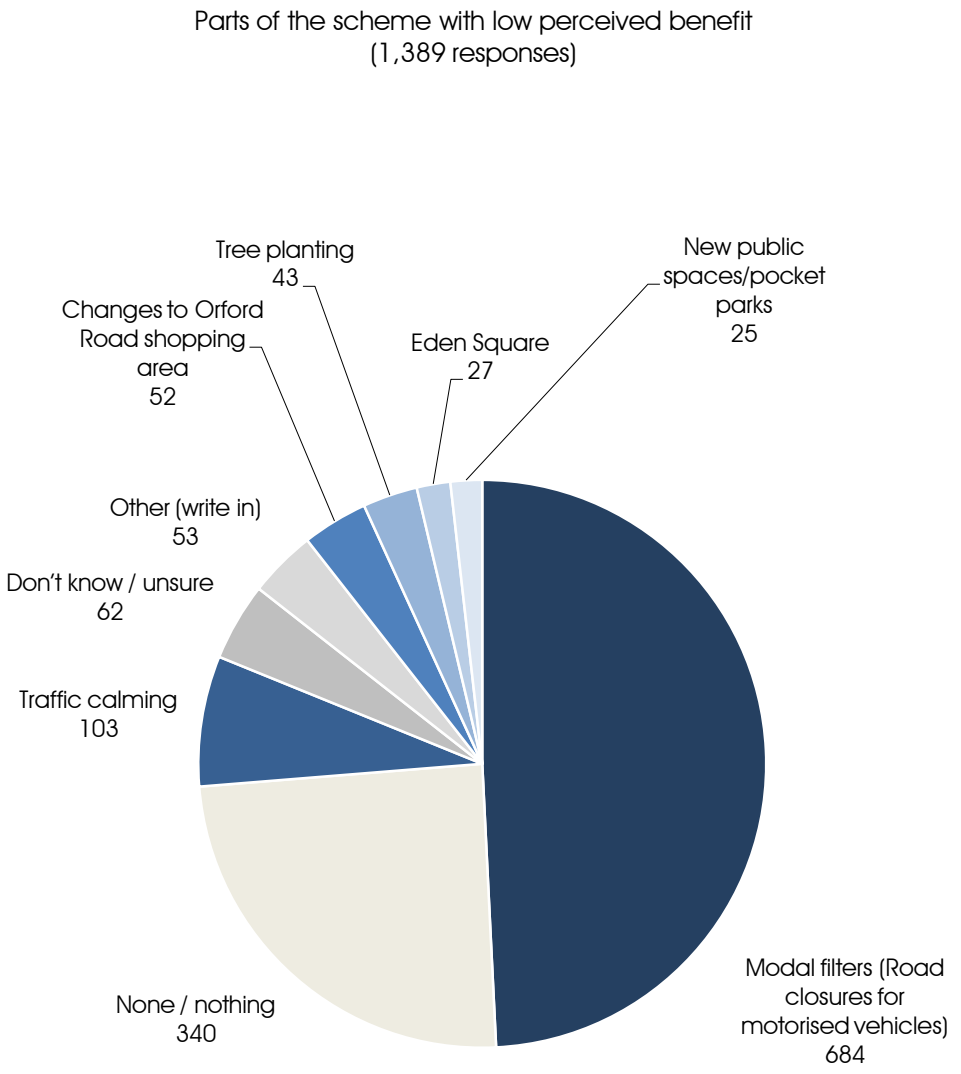


Figure 21: Parts of the scheme with low perceived benefit

The modal filters (road closures) were the main area of the scheme that residents perceived to have the lowest benefit to the area (49%), as shown in Figure 21. However many of the changes that were positively received (Figure 19), such as those to Orford Road, the public space improvements and traffic calming would not have been so extensive or possible without the introduction of the road closures.

The second largest percentage of responses (24%) stated there were no elements of the scheme that provided a low benefit.

3.1.6 Residents' suggestions for improvement

Having experienced the changes for over a year, residents were given an opportunity to suggest adjustments to the scheme. These responses were categorised and the main themes are shown in Table 2.

55% of responses said they would not adjust the scheme, and only 1.7% said they would scrap the scheme and go back to how it was before. Despite 49% of residents suggesting the road closures were the part of the scheme with the lowest perceived benefit, only 17.6% said they would like to see alterations to them now that the scheme was complete. This suggests that the majority of residents have accepted the changes. In general, the comments were constructive, with residents suggesting extra changes such as better lighting, more traffic calming, improving the surfacing of roads and footways, keeping the streets clean and adding more greenery.

We recognise that emergency service access has been a key concern for residents throughout the design and implementation of the scheme. We have met regularly with the emergency services throughout the scheme as we do on all projects, and have discussed any concerns with them. As part of this review, we have met with the emergency services and this has reported in the key stakeholder engagement section.

Additional adjustments that should be made to the scheme		
Resident's comment	Number of Responses	%
No/ Nothing/ None	816	55.1
Too many road closures/ congestion/ open up roads	261	17.6
More/ better lighting	86	5.8
Better/ more parking for cars and bikes	42	2.8
CCTV/ traffic calming needed	34	2.3
Improve roads/ layout/ surfaces/ pavements	30	2.0
More communication/ involvement of residents	27	1.8
Scrap it/ go back to how it was	25	1.7
Improve signage	22	1.5
Maintain/ add more greenery	21	1.4
Don't know	21	1.4
Keep the streets clean	20	1.4
Increased pollution	19	1.3
Don't block roads	14	1.0
Stop wasting money/ not value for money	11	0.7
I'm happy with the changes	10	0.6
Complete work/ extend to other areas	6	0.4
Add more facilities in open spaces	5	0.4
More shops	5	0.3
Delivery and emergency services cannot operate properly with road closures	4	0.3
Increase noise levels	3	0.2
I'm moving as a result of all the changes	1	0.0

Table 2: Residents' comments on additional adjustments that should be made to the scheme (figures rounded up)

Summary

- The majority of residents feel the appearance of the local area has improved, which was one of the main aims of the project.
- The changes to the Orford Road area, introduction of traffic calming, tree planting, public spaces and parks are seen as the main benefits of the scheme.
- Modal filters (road closures) had the lowest perceived benefit. However, the majority of residents felt that further changes to the scheme were not required.
- Despite 49% of residents suggesting that modal filters (road closures) were the change with the lowest benefit to the area, only 17.6% expressed a desire to adjust these now they were implemented.
- 55% of residents said they would not change anything and only 1.7% said they would scrap the scheme and go back to how it was before.
- Only four (0.3%) residents mentioned emergency service access as a problem.

3.2 Business survey

Businesses play a key role in attracting visitors from both outside and within the Village area. This contributes to achieving Aim 4: Make the Village area more attractive for residents and visitors. It is important that businesses are able to operate successfully, and creating a positive community environment encourages this.

In September 2016, 39 local businesses took part in our review survey. The questions were designed to gauge their thoughts on the design and layout of the scheme, how business activity and custom had been affected by it, and their overall opinion of the changes.

Of the 39 businesses interviewed, 22 were based in the Orford Road area and the rest were located throughout the Village.

3.2.1 Design and layout

Business owners were asked a variety of questions about the changes to the Orford Road area, the appearance and layout of the scheme, and parking and loading facilities. Their responses could fall into one of five categories: Very Poor, Poor, Neither or Don't Know, Fairly Good, or Very Good.

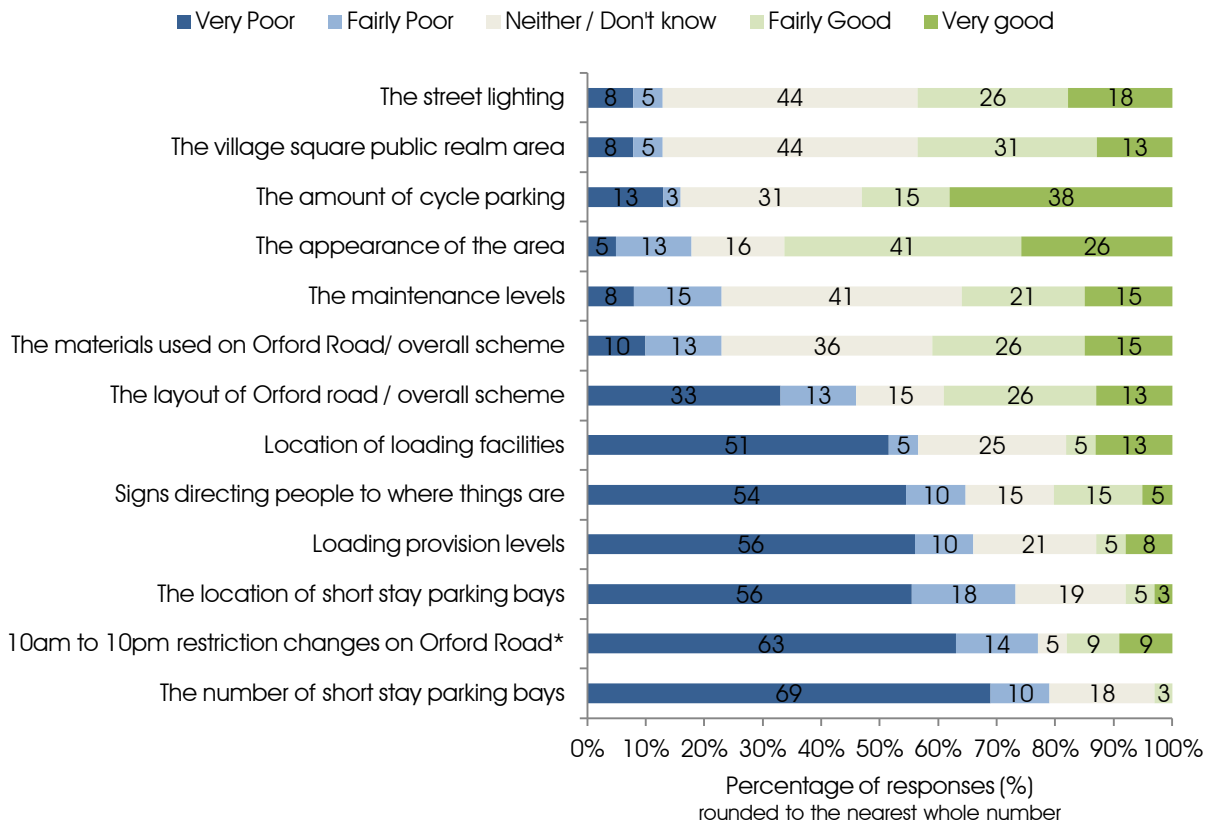


Figure 22: Summary of design and layout survey questions for business holders

** question was only asked to the businesses located on Orford Road (22 out of the 39 responded)*

numbers shown are percentage values

Figure 22 shows a summary of the responses to the questions asked about the design and layout of the scheme.

In general, businesses were positive about the look and design of the scheme with 88% providing a neutral or positive response to the changes in the Village public realm. The appearance of the area was rated as 83% neutral or positive, with the level of maintenance and materials used for the design receiving a 77% positive or neutral response.

The two main areas of concern for business owners were parking and loading facilities in the area, with some concerned about way-finding and navigation in the area. Both the location and number of short-term parking and loading bays were highlighted as issues. Additionally, the 10am to10pm vehicle restrictions introduced on Orford Road was poorly received by 63% of the business owners.

This suggests that while many of the businesses were happy with the appearance and layout of the new scheme, some were concerned over parking, loading facilities and vehicle access within the area.

Parking was also mentioned by residents in regard to the number of short stay bays near to the shops and the location of car club bays. As part of the layout of the scheme a number of short stay and loading bays have been removed, however, where possible we have relocated these. Table 3 shows the length in metres of kerb side changes to short stay, shared, loading and disabled bays. Please note this shows net changes therefore in some parts of the road there may be a loss of parking in one area and an increase in other parts of the road to provide a net increase or net loss.

Parking levels by street and type by metre of kerb space				
	Short Stay	Shared (resident) bay	Loading bays	Disabled Bays
East Avenue	-30			
Orford Road		-56.4	12	6
Eden Road				6
St Mary's Road	39.1			
Copeland Avenue	-1.4		14.2	
Merton Road	-9.8			
Fraser Road	-15.5			
Shernhall Street	7.3			
Grove Road	-12.3		9.8	
Third Avenue	22			
Second Avenue	6			
Total (metres)	4.9	-56.4	36	12
Total (bays)	1	-9	6	2

Table 3: Parking levels by street and type by metre of kerb space

Assuming each bay is five metres in length, the table shows that there has been a reduction of nine shared used bays predominately from Orford Road, however there has been a net increase of six loading bays.

Short stay bays have also increased by one bay, although with a reduction of six bays in East Avenue.

3.2.2 How business has been affected by the scheme

A number of questions were asked about how local business operations had been affected as a result of the scheme. This included changes to deliveries and suppliers, and perceptions/views on any change in the number of customers, visitors and overall turnover.

The ease with which suppliers can reach local businesses was shown to be an issue, with 43% saying it had become very difficult since the implementation of the scheme.

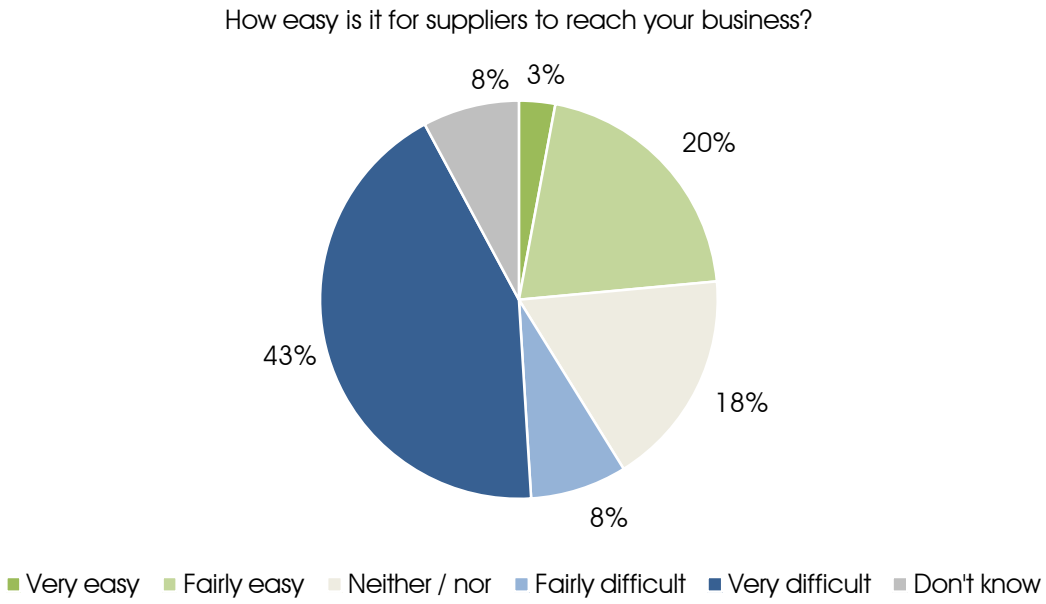


Figure 23: How easy is it for suppliers to reach your business?

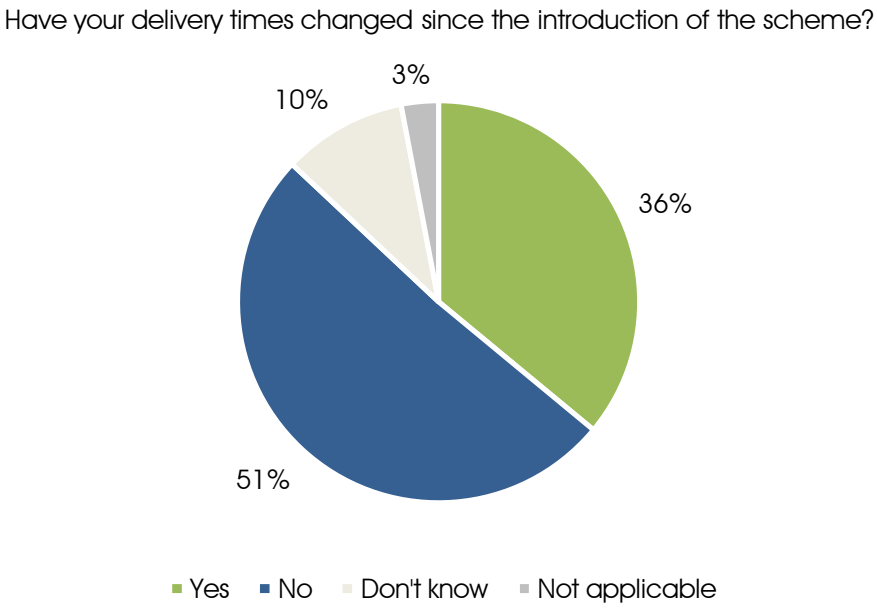


Figure 24: Have your delivery times changed since the introduction of the scheme?

In Figure 21, 66% of businesses said there were poor loading provision levels, 77% said the 10am-10pm restriction was poor and 79% said the number of short stay parking bays was also poor. In Figure 22, 51% of businesses said that it is difficult for their suppliers to reach them, suggesting that the restrictions are an issue.

However, even with the high level of concern, Figure 24 shows that only 36% of business owners have changed their delivery schedules as a result of the changes. Being that it is over a year since the introduction of the scheme, this suggests that the majority of businesses have not needed to make a change, although we do recognise this could be due to suppliers not wanting to change their delivery schedules. In each circumstance it is assumed deliveries to shops are still occurring.

Businesses were also asked if they perceived the number of customers, visitors and turnover had changed because of the scheme. In general the responses were mixed as some businesses suggested increases while others suggested decreases. The number of customers on weekdays was perceived to have decreased by 45% of the businesses while only 26% perceived to have decreased at the weekends.

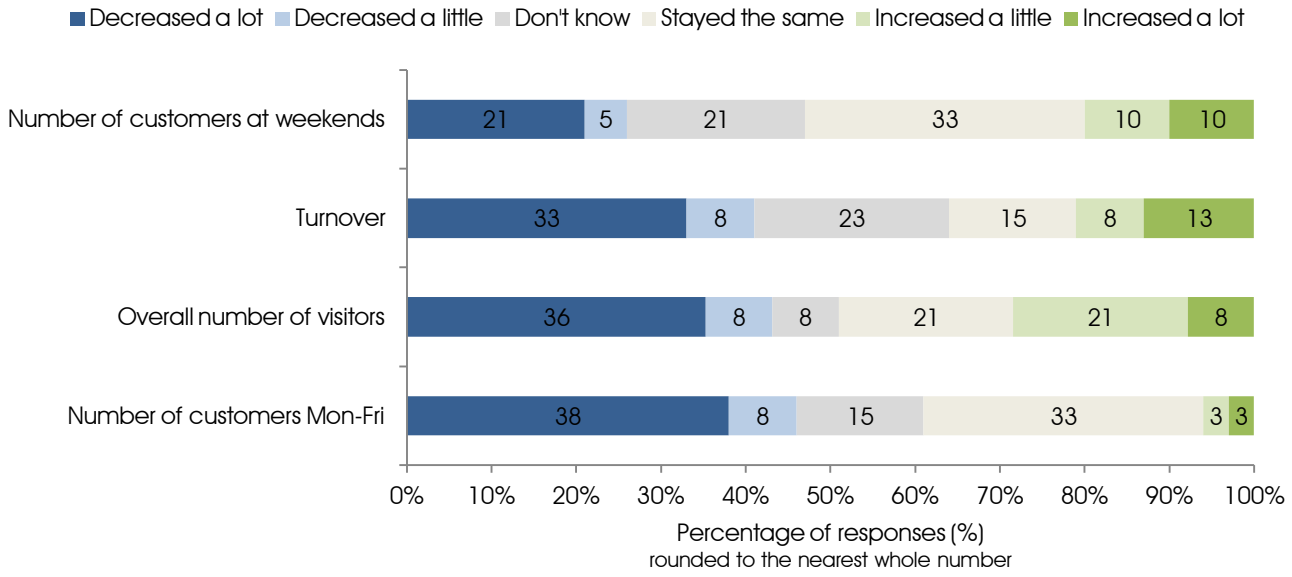


Figure 25: Business owners perceived level of customers, visitors and turnover

3.2.3 Businesses' overall opinion of the scheme

Finally, businesses were asked their overall opinion of the scheme. The response was mixed, with 54% having either a positive response or not expressing an opinion.

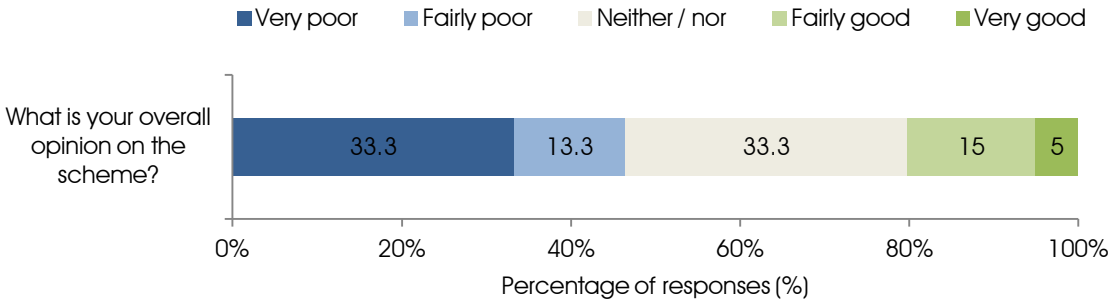


Figure 26: Business owners overall opinions of the scheme

Summary

- Business owners were positive about the appearance of the scheme, the materials used, the Village public realm area, the street lighting, cycle parking and maintenance.
- Businesses felt more negative towards parts of the scheme relating to directional signs, parking and loading bays.
- Over 75% of businesses gave negative feedback on the 10am to 10pm restriction.
- There were mixed responses from businesses on how they had been affected by the scheme. However, more than 50% said the number of customers had either improved or stayed the same.
- Forty-one per cent of businesses said turnover had decreased, while 23% said they did not know if there had been a difference in turnover, compared to 36% who said it had stayed the same or increased.
- Fifty-three per cent of business owners' overall perception of the scheme was either positive or neutral. 47% were negative, suggesting that the 10am to 10pm restriction, loading and parking facilities were the main areas of concern.

3.3 On-street visitor survey

A series of on-street surveys were held in the second half of 2016. The aim was to understand what visitors to the area thought of the scheme. This section considers if the scheme has met Aim 3: Make it easier for people to walk and cycle around Walthamstow Village; and Aim 4: Make the Village area more attractive for residents and visitors.

In total 117 visitors were interviewed. In order to separate the data group from those included in the resident survey, only non-local visitors were interviewed. Respondents were deemed to be non-local if they did not live within the defined limits of the Walthamstow Village scheme.

Prominent locations in the Village area were chosen for the surveys where visitor footfall is most likely to be high. These included Orford Road, areas by the museum on Vestry Road and St Mary's Road towards Walthamstow Central Station.

3.3.1 Transport methods

The first series of questions were about the common modes of transport that non-local visitors used to reach the area. Figure 27 shows this was primarily by bus, car or tube. The number of non-local visitors who walked or cycled to the area was low compared to the equivalent question within the resident survey.

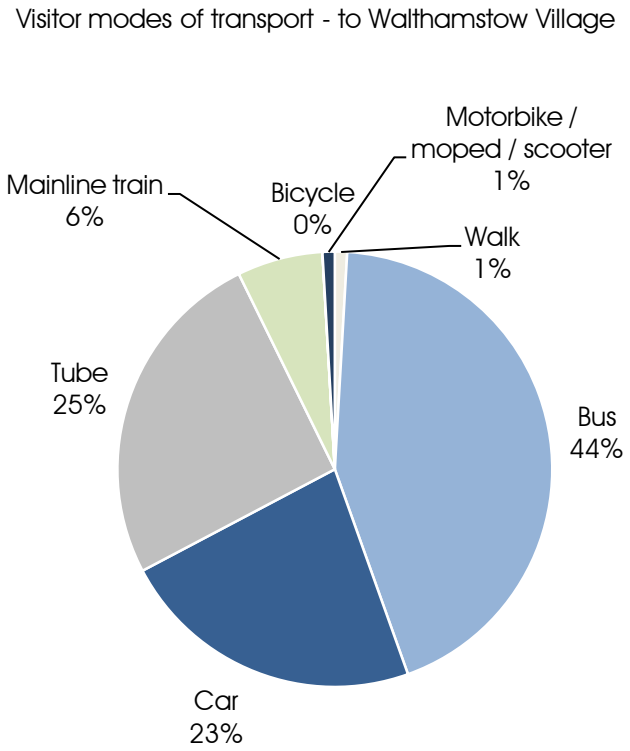


Figure 27: Main visitor modes of transport to the area

Visitors were asked if they had changed their mode of transport to travel to Walthamstow Village as a result of the new scheme. As shown in Figure 28, only 2% of people said it had changed and 82% said that it had not.

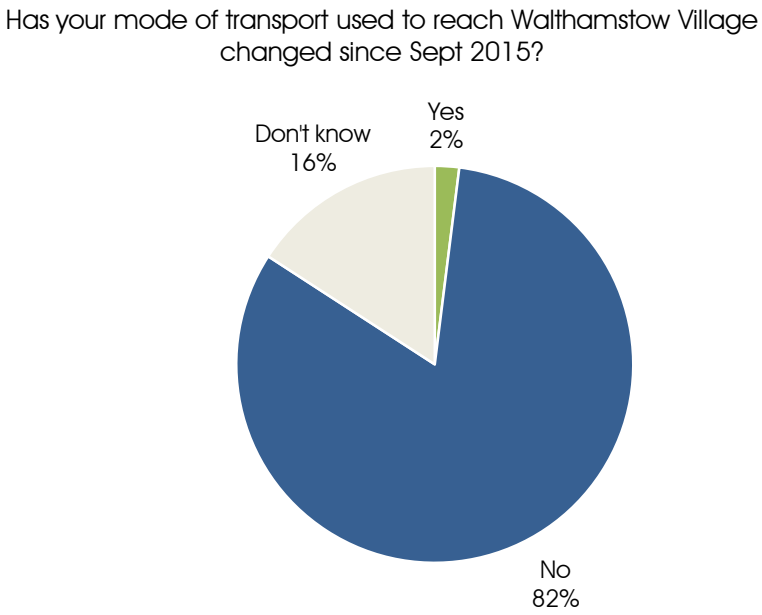


Figure 28: Changes in visitor transport mode as a result of the scheme

3.3.2 Visitor parking

As shown in Figure 28 of those people who drove the majority parked in The Mall car park, at a place of work, or at a friend or family's house. Only three of the 29 car users parked on a street in the Village area.

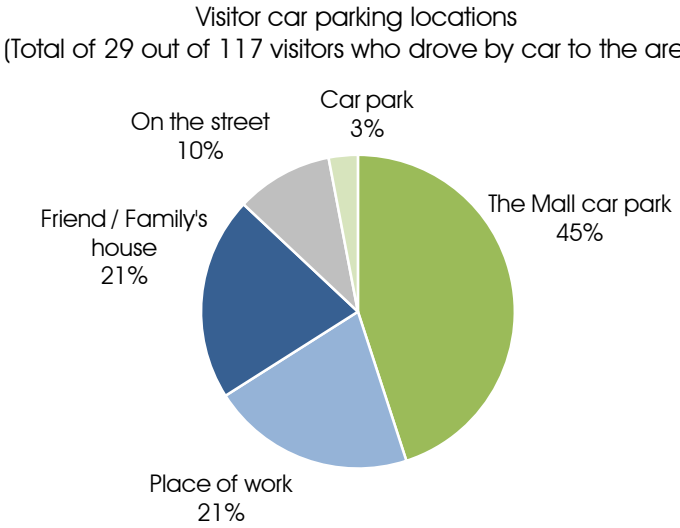


Figure 29: Visitor car parking locations

When asked whether there were enough bicycle parking spaces in the area, 82% of people did not know. Of those that did, the majority said there was enough.

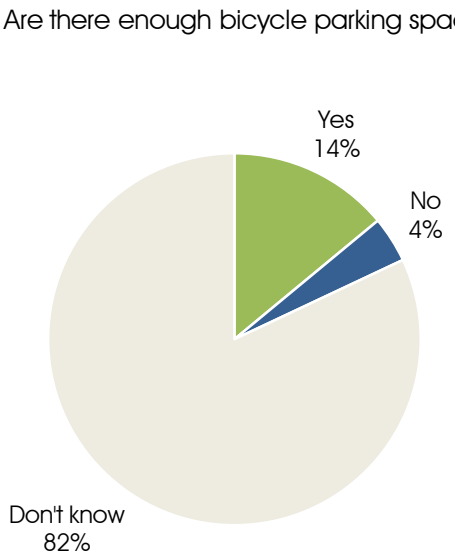


Figure 30: Are there enough bicycle parking spaces?

3.3.3 Visits to the area

In this section, questions explored visiting patterns to the area and if people were more or less likely to visit as a result of the scheme.

Visitors were asked their primary reason for visiting the area with 65% of respondents saying it was to visit a restaurant or pub. Forty sic percent said they were shopping for non-food items, 31% said they were shopping for food and 27% worked in the area.

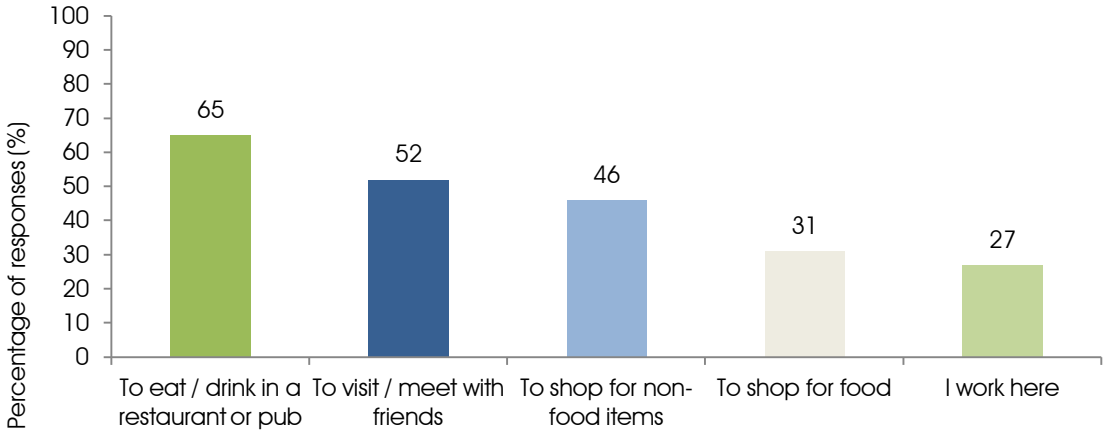


Figure 31: Reasons for visitor trips to the area (respondents allowed more than one answer)

Figure 32 shows how frequently those surveyed visit the area. In general this was high, with 64% visiting at least once a week. Only 1% said this was their first visit to the area, which suggests most are frequent visitors. They were also asked if their frequency of trips to the area had changed because of the scheme.

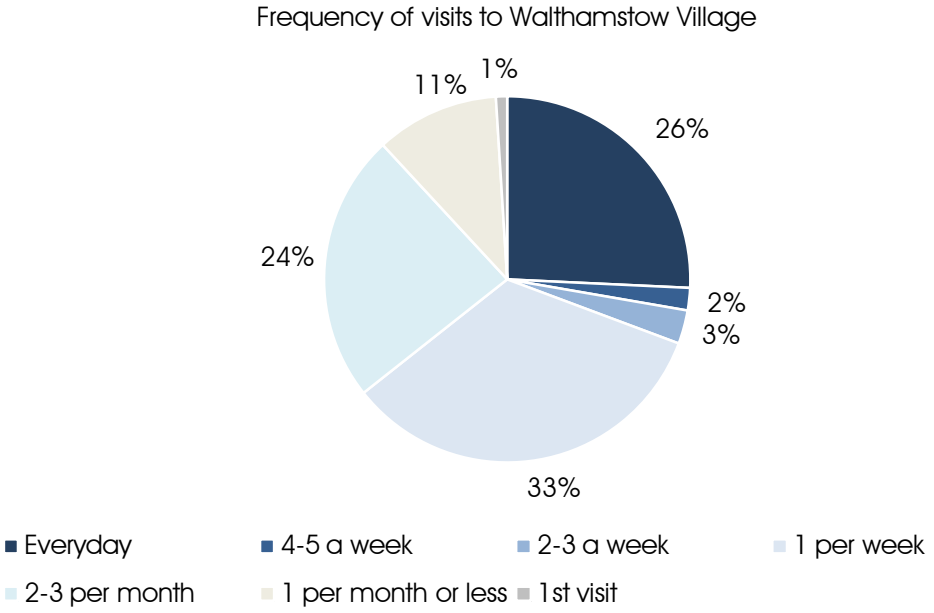


Figure 32: Frequency of visitor trips to Walthamstow Village

As shown in Figure 33, of all the people interviewed, none said their number of trips to the area had decreased, however, 47% of non-local visitors said their trips had increased since the scheme was introduced.

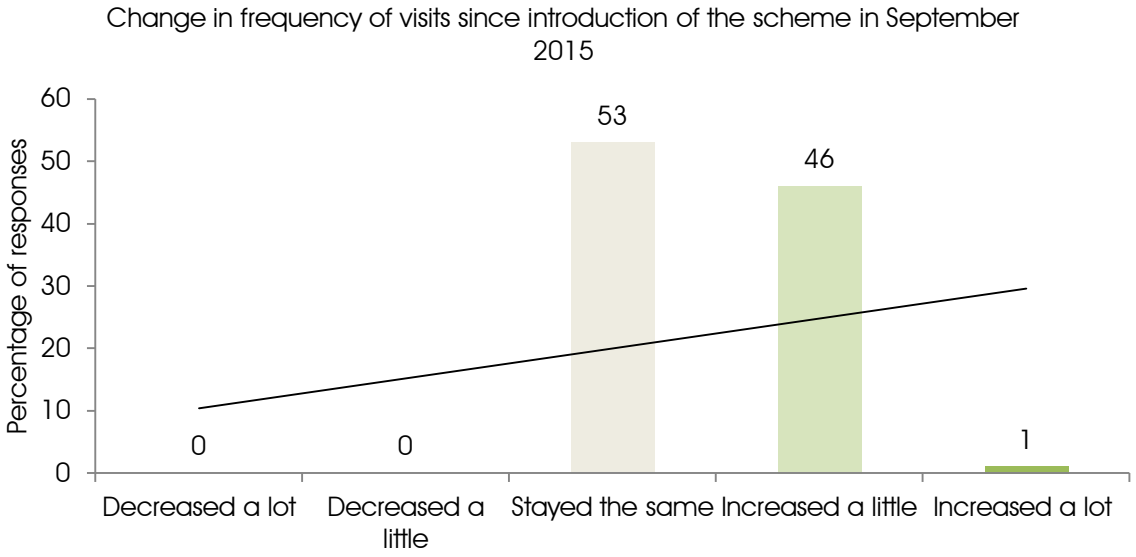
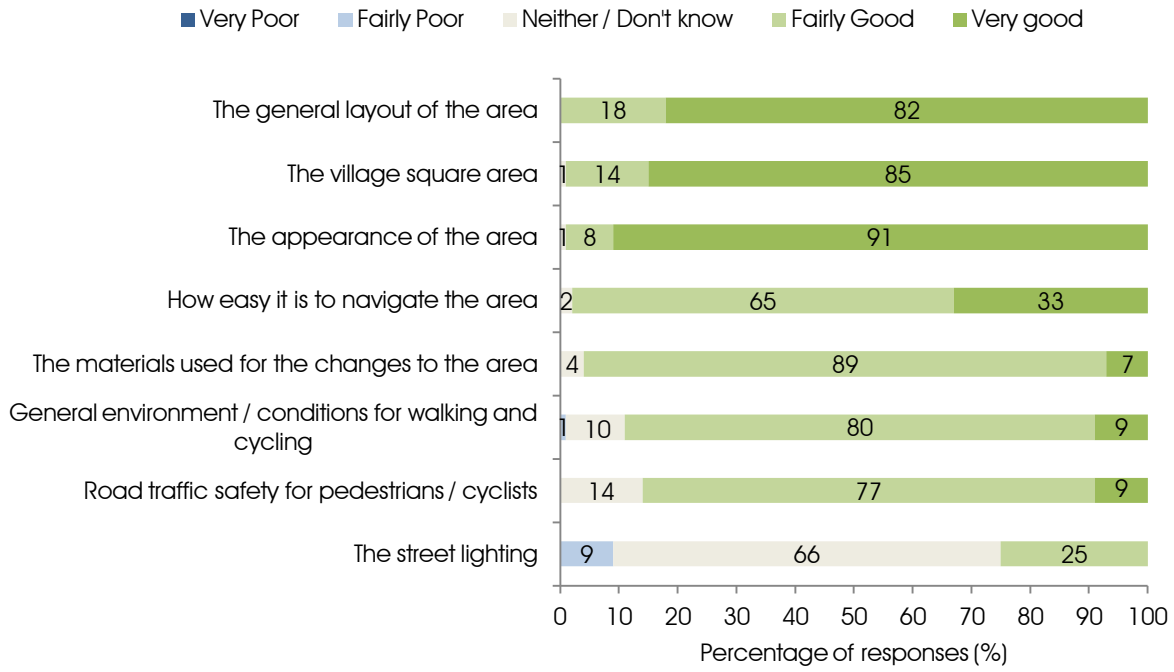


Figure 33: Change in visitor trip frequency

3.3.4 Impressions of the scheme

Visitors were positive about all parts of the scheme. The general layout, the Village Square and the appearance of the area were mostly rated very good (Figure 34). Visitors also stated it was easy to navigate the area and that the environment was good for walking and cycling with good road safety.



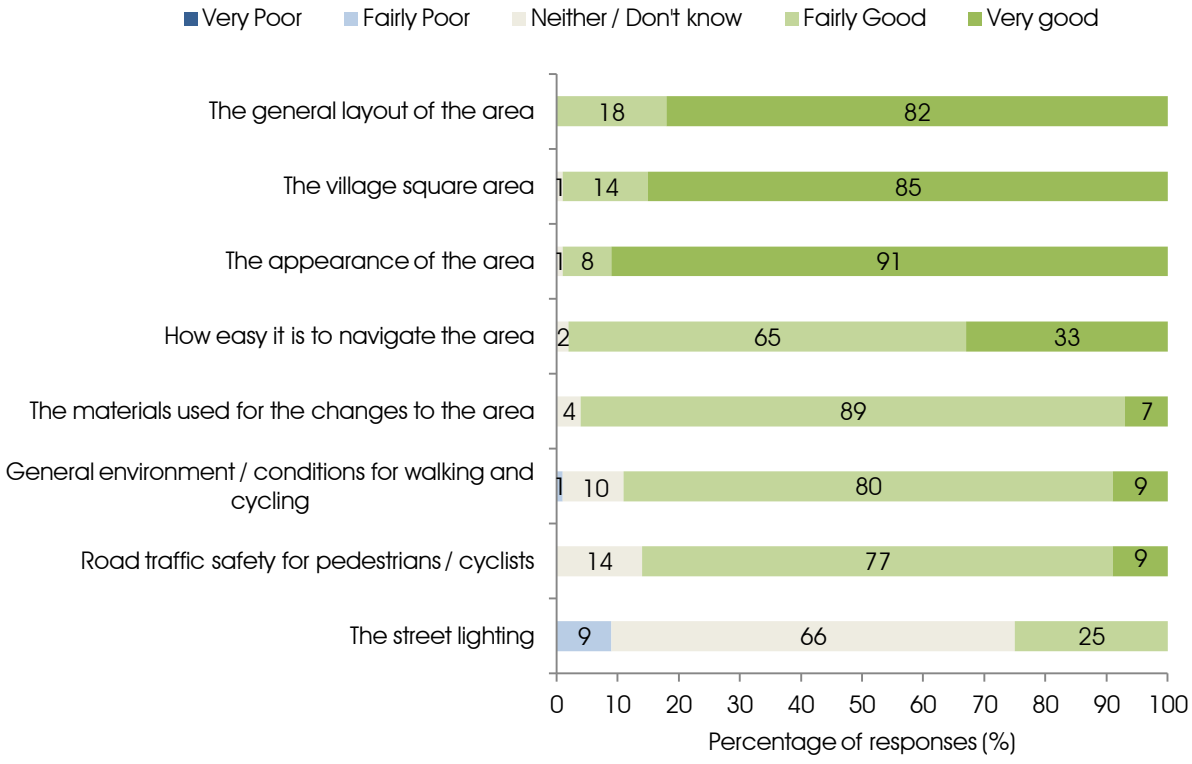


Figure 34: Visitor impressions of the area

Visitors were asked if each feature had become better, worse or stayed the same as a result of the scheme (Figure 34). The majority of visitors were very positive about improvements to the Village Square, the appearance of the area and the general layout. Seventy-five per cent suggested that navigating the area had become better indicating a wayfinding not to be an issue.

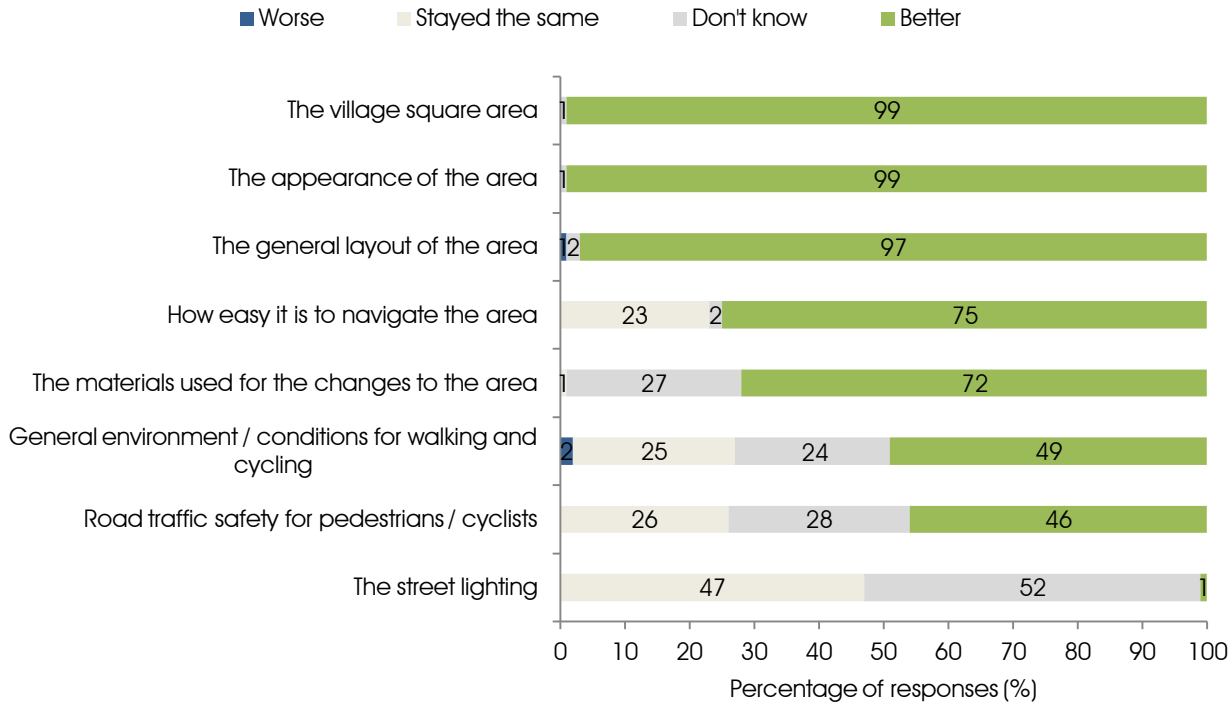


Figure 35: Change in visitor impressions as a result of the scheme

3.3.5 Overall opinion

Visitors were asked if they would recommend visiting the area, and if they would make any changes to the area now that the scheme had been introduced. Figure 35 shows 100% of visitors had a positive opinion of the overall scheme with 84% stating it was very good.

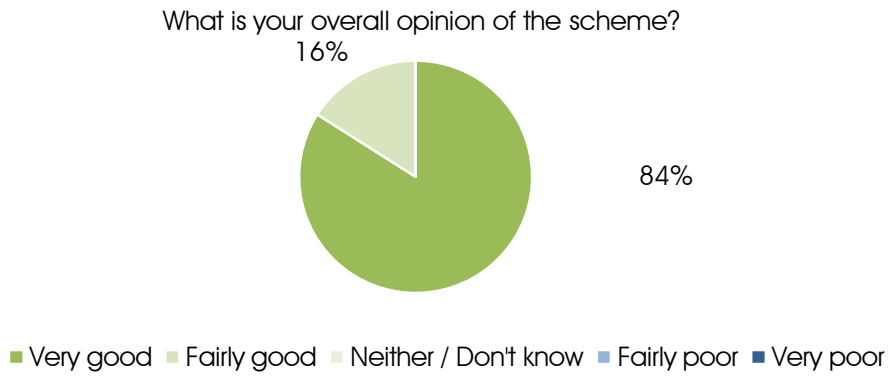


Figure 36: Visitors' overall opinion of the scheme

All of the visitors said they were likely to recommend visiting the area to someone else. The majority (94%) stated they are likely to recommend visiting the area as a result of the changes.

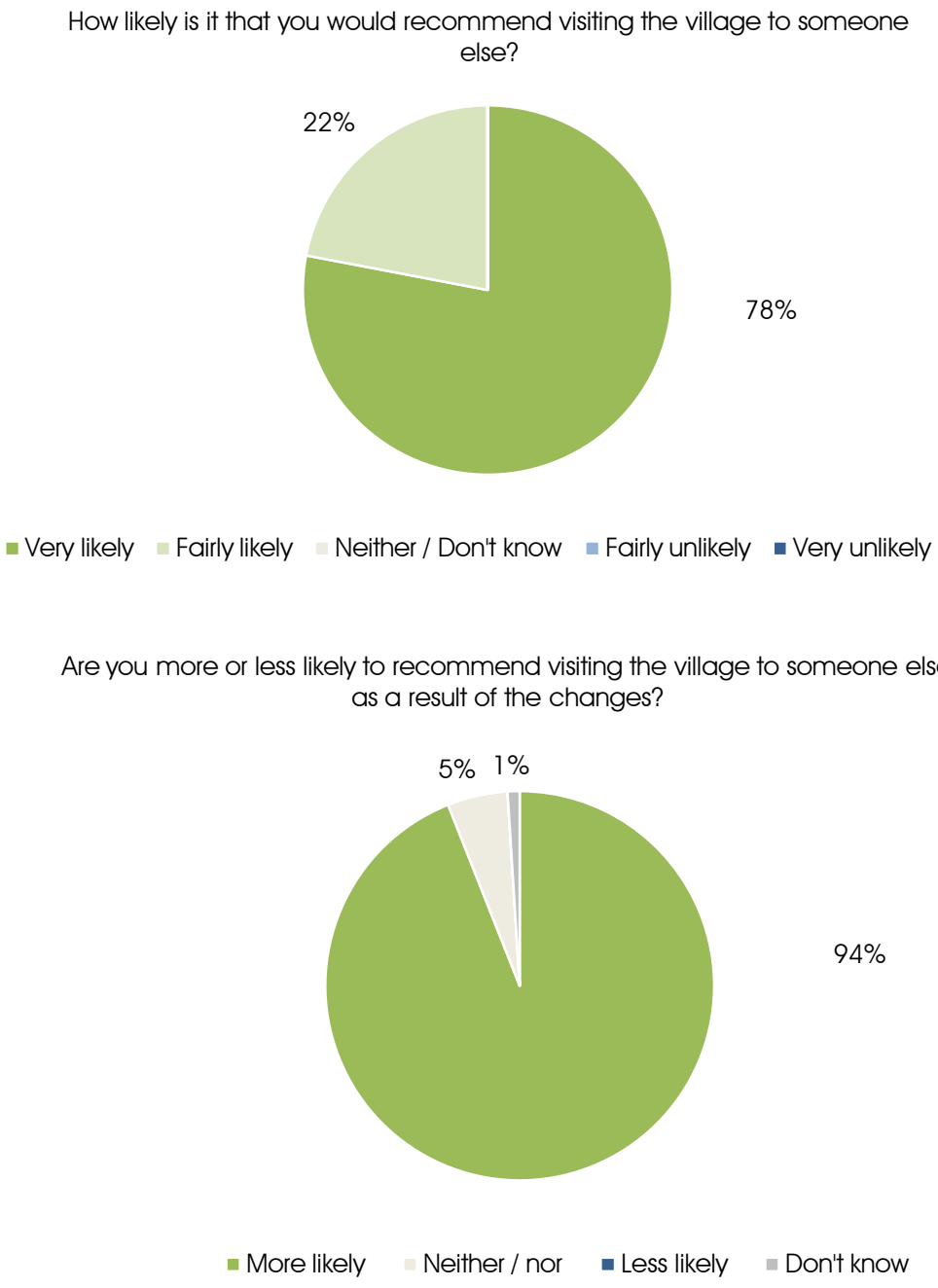


Figure 37: Would visitors recommend visiting the area to someone else?

None of the visitors felt that further adjustments to the scheme were needed.

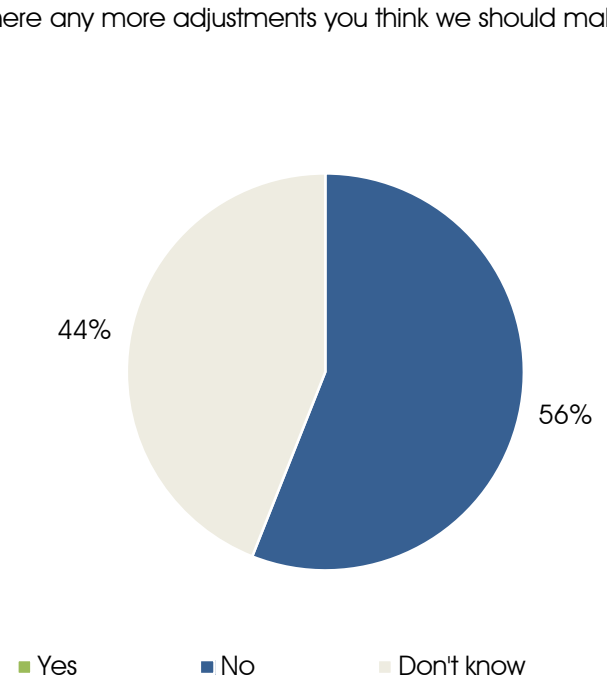


Figure 38: Are there any further adjustments you think we should make?

3.3.6 Summary

- The overall opinion from visitors towards the scheme was extremely positive, with 84% saying it was very good, and 16% good. The majority of visitors (94%) said they were more likely to recommend the area to someone else as a result of the changes.
- Most on-street visitors (92%) said they had arrived at Walthamstow Village by bus, car or tube. A small number travelled by bicycle or walked, suggesting that at present these methods of transport are not as popular for non-local trips.
- The majority (82%) said that the changes brought about by the scheme had not led them to change their mode of transport to reach the area.
- Of the people interviewed, the frequency of their trips to the area was high. Restaurants and pubs were popular destinations as well as other retail premises. None of the on-street visitors said their number of trips to the area had decreased because of the scheme.

- The visitors were highly positive about the appearance of the area, the general layout, and the Village Square area. Nearly all (between 97% - 99%) agreed that these areas had improved because of the scheme. Visitors felt that the environment had improved for walking and cycling, that the materials had improved, and that there was improved road and traffic safety. Not many people commented on the changes to the street lighting.
- Seventy-five per cent of visitors said navigating the area had become better. This could suggest a successful way-finding strategy.
- None of the respondents suggested the scheme needed to change.

3.4 Key stakeholder meetings

As part of the review, and to gain further insight into the scheme, we held a series of meetings with key stakeholders including the Emergency services, places of worship, resident groups and local campaign groups. This section gives an overview of the discussions held and the positive and negative comments that were shared.

3.4.1 Emergency services

The emergency services were considered, informed and consulted at every stage in the development of the Walthamstow Village scheme. We discussed the feasibility of the scheme with them in traffic liaison meetings and individual scheme meetings in 2014 and in June, July and August of 2015 we met with the emergency services to discuss the concept design and statutory notifications of the scheme.

As part of this review we have met with the three emergency services to gather their specific feedback on the scheme, and any impact on local operations.

All three emergency services have requested that we continue to update them with revised layout plans as early as possible so they can pass this onto their crews. Several have also asked us to consider putting up additional signs showing how they can access properties, which we are currently working on.

More generally, we have received a letter from each of the borough managers at the Police, Fire and Ambulance Service setting out their support of the objectives of the Mini-Holland programme, and ongoing commitment to work with us to deliver it

The following is a summary of key points discussed at recent review meetings.

3.4.2 London Ambulance Service - 12/10/2016

- The London Ambulance Service requires road layout updates to be passed on sooner rather than later so they can update their navigation systems. Detailed information showing the final traffic management layout in the area has been provided on a number of occasions in response to LAS feedback.
- They have considered trialling bicycle and motorcycle services in the area, but the density of callouts in the area is, at present, not considered high enough to justify the cost.
- They acknowledge that their mobile response strategy means that crews attending an emergency are not necessarily local to the area and therefore may not know details about the road layout.

3.4.3 Metropolitan Police - 12/10/2016

- The most important factors for the Metropolitan Police were response times in the area, and response times on the main roads on the periphery of the scheme area.

- They will continue to monitor the situation as normal. If any internal response time or journey time data changes they will contact the Council to discuss any concerns.

3.4.4 London Fire Brigade – 04/11/2016

> *"LFB [London Fire Brigade] position remains the same as in the past in that the LFB are happy to work in conjunction with LBWF [London Borough of Waltham Forest] to ensure all parties approve of and are satisfied with the Mini-Holland scheme."* ***Nic McCallum – Walthamstow Fire Station***

- The London Fire Brigade will agree a business plan for the next five years. One of the key outcomes will be to reassure Waltham Forest residents that all properties can be reached within six minutes by the first appliance inline with current targets.
- The London Fire Brigade support measures which will result in reductions in traffic or traffic collisions allowing quicker response times to emergency calls.
- The London Fire Brigade have continued to be part of the scheme development and delivery process, including responding to residents' concerns. For example, a resident of Pretoria Avenue wrote to London Fire Brigade following an incident in the area outlining possible access issues for the emergency services. London Fire Brigade Officers visited the site and later reassured the concerned resident there were no access issues.

In a recent article in the Waltham Forest Guardian (8 March 2017) London Fire Brigade Borough Commander of Waltham Forest said that while delays have gone up in 2016, attendance times are at a six-year high. Jamie Jenkins said; "Our attendance times in the borough are among the best in London with a first fire engine arriving on average in four minutes and 56 seconds and a second in six minutes and 45 seconds. Both are well within our average attendance time targets of six minutes for a first and eight minutes for a second."

Overall, all three organisations stated that they continued to support the objectives of the scheme and understand that routes in the area will have changed as a result. We have asked that they continue to raise any specific issues with us so we can look at these quickly and make adjustments where necessary.

3.4.5 Community group meetings

In September, October and November 2016, we invited residents, community groups, places of worships and schools within the scheme area to meet us to discuss the review and give feedback. We met with:

Residents and resident groups

- Walthamstow Village Residents' Association
- Wingdolph Residents' Association
- Residents of Eden Road
- Residents of East Avenue
- Residents of Church Lane
- Residents of Folkestone Road
- Walthamstow Almshouses

Religious institutions

- Member of the East Avenue Mosque congregation
- Shernhall Methodist Church

Schools

- Holy Family Catholic School

Campaign groups

- E17 Streets 4 all
- Waltham Forest Cycle Campaign

A range of issues and observations were raised by the the various groups and the following section gives an overview of the most frequently raised issues. This list is not exhaustive, but is a reflection of the main issues/themes that affect the community as a whole.

3.4.5.1 Traffic levels within the Village

A number of resident groups said the traffic levels on the roads within the Village had noticeably reduced, and that the percentage of road users walking and cycling had started to increase. This included comments such as:

"More people on the street and out playing. In the summer we can sleep with windows open now. We couldn't before from the noise of the lorries."

"Our friend who used to drive to Henry Maynard School has now bought a bike."

"It is phenomenally different to be able to walk out of my house onto a quiet route."

"It is much nicer to walk around – especially Grove Road."

However, some groups raised concerns over the level of traffic on Church Lane, Vestry Road, East Avenue and Third Avenue. They were concerned that old buildings in the historic centre of the Village were at further risk of damage due to the volume and size of vehicles passing through.

> *"The traffic on Church Lane has increased. This is not a main road but has heavy traffic and lorries traversing down it. Cars charge down there."*
>
> *"It feels like traffic has gone up 100%."*

At a number of meetings we discussed what could be done to improve the situation, and some of the suggestions put forward included:

- Further traffic calming to slow vehicles using the route
- A road closure prior to the one-way section at the junction of Church Lane and Orford Road by the old house
- A bus gate to only allow buses to use the route but restrict vehicle movements
- A vehicle weight limit on this section of road to reduce the number of heavy lorries using the route.
- Extending the times of the right turn ban from shernhall street

The groups acknowledged that further work would be required to understand the impact of any additional changes, and that further engagement with local residents would be required to ensure support if they were to be taken forward. In response to residents' concerns a further traffic survey was undertaken in Church Lane during the review, the results of which can be found within the technical section of this document.

3.4.5.2 Main roads

At the meetings, a number of residents raised concerns about the main roads surrounding the Village area, including Lea Bridge Road and Hoe Street. Comments included suggestions that the roads were now busier and that it took longer to get to where they wanted to go. Others had easier experiences depending on the time of day.

"Hoe Street and Lea Bridge Road seems much worse and is bearing the brunt of the improvements."

"We think you have to allow an extra 20 minutes per car journey."

"On Hoe Street cars are bumper to bumper, on Lea Bridge Road and around Whipps Cross it is not worse."

Chapter 4 of this document contains an analysis of technical data collected since the introduction of the scheme and as part of this we have reviewed traffic and bus performance data on the main roads to see the impact of the scheme on these roads and whether residents' concerns are supported.

3.4.5.3 Bus routes

As well as more general concerns about the impact on the main road network, specific concerns were raised about bus times and how this will affect the people who rely on them.

"The routes are congested. Buses are always late or don't show up which makes it difficult to get across the borough."

"At 8am Shernhall Street is very busy and journey times on the bus feel longer."

To understand how buses have been affected, and again whether residents' concerns are supported, we gathered Information on the bus route journey times from TfL. An analysis of the data can be found in chapter 4.

3.4.5.4 Orford Road

The road closure introduced on Orford Road, including the materials and design, was well received by most groups. Some commented on the possibility of extending the operating times beyond 10am to 10pm.

Some groups raised concerns about the number of vehicles still using the road during the restricted times and the speed of vehicles.

Comments included:

"If we can't close the road 24 hrs a day can we have a 5mph speed limit?"

"Orford Road is so much better we just go there for fun now. It is full of life and very safe. Closure time could be adjusted to be safer."

During the development of the scheme we put in a request to the Department of Transport to set a 5mph limit, and it was declined.

The Department of Transport sets the prescribed signs that can be legally used for the restriction on Orford Road, which are also part of the Highway Code. Signage has been made as clear as possible to try to reduce drivers from accidently driving through the restricted zone while adhering to what is permitted by law

3.4.5.5 Blended 'Copenhagen' crossings

In meetings, concerns were raised over blended 'Copenhagen' crossings and whether they were safe for all road users. The main area of concern was that there are no markings between the pavement and carriageway, leading to issues for vulnerable road users.

We understand the concerns raised regarding the blended 'Copenhagen' crossings and recognise that these are new types of infrastructure that will take people a little while to get used to. These crossings have mostly been introduced at gateway locations to the "village" areas, or to other areas where traffic levels are low.

'Copenhagen' crossings are commonplace in mainland Europe and have been introduced extensively over the last 15-20 years, particularly in cities and countries that are considered the best places for walking and cycling, including Holland, Denmark and Germany. Opportunity to learn from elsewhere in the UK is currently limited and the first 'Copenhagen' crossings were only introduced in Clapham in June 2014. Each location is designed taking into consideration site specific details and before installing the crossings, we carried out a road safety audit to assess any potential safety issues.

As blended 'Copenhagen' crossings have been implemented. information signs have been displayed at each location explaining what they are, how to use them and how they reinforce the highway code. We have been raising awareness of the crossings within the community through consultation materials, letters and local media, and in our road safety work with schools

We will continue to review the crossings as part of our ongoing monitoring, and with TfL as part of their wider infrastructure monitoring programme. However, it is worth noting that the initial Road Safety data (section 4.6) shows a reduced number of collisions at junctions where new blended 'Copenhagen' crossings have been introduced.

3.4.5.6 Shernhall Street – crossing locations

A number of groups raised the issue of the removal of islands on Shernhall Street, as part of a separate corridor improvement scheme, and how this had made it difficult for people to cross the road.

The scheme on Shernhall Street was designed to encourage lower vehicle speeds and improve safety by narrowing the road and introducing traffic calming. We have improved crossing points where possible and maintained all existing informal crossings. The major area of concern was the removal of the island at Vallentin Road junction. While the island did not help to reduce speed and drivers rarely stopped to allow people to cross, we understand the concerns raised regarding the road safety on Shernhall street and to improve the situation a new zebra crossing has been introduced in place of the island in response to local feedback.

3.4.5.7 East Avenue - parking

Community groups said that the extended parking hours and provision of car club/ short stay bays made it difficult for people visiting local destinations to park. As part of the scheme we had to remove some parking bays to implement the modal filters but where possible we have relocated the bays and as can be seen in the previous section this has resulted the number of short stay bays being increased overall, albeit very slightly.

3.4.5.8 Grove Road

Residents felt that traffic had reduced and made it easier for people using the road to get to and from schools, and better for those using the new public space.

> *"Costcutter and pharmacy are much better, anti-social behaviour has reduced in the area."*

3.4.5.9 Emergency services

Emergency service access was discussed during the meetings, however it was acknowledged that we were meeting with the emergency services regularly and consulting them on scheme proposals and changes. Only four respondents (0.3%) to the resident survey said they felt delivery and emergency services couldn't operate properly with the road closures in place (Table 2).

3.4.5.10 Consultation approach

Although it is not part of the review to examine the consultation process, we did discuss it with some residents. They felt that initial communication about the scheme and the trial was not sufficient. Residents wanted more consultation on the bigger changes; this feedback will be used to help develop future schemes in Waltham Forest.

3.4.6 Summary

Following our discussion with each community group/organisation it was felt there were a number of key areas where the community has benefited from the scheme. These include reduced traffic and noise on the residential roads, the development of Orford Road, and improved public spaces.

However, each group also had it concerns with the scheme and these were traffic on Vestry Road - Church Lane – East Avenue – Third Avenue, reliable bus times, main road traffic, and road user safety on blended 'Copenhagen' crossings.

3.5 Summary of community feedback

Methods of transport

- Walking is the biggest single mode of transport for regular journeys; 28% of respondents opted for this.
- Forty-three per cent of respondents who live in the Village area said they do not own a car. This is substantially lower than the 54% figure for the Hoe Street ward in the 2011 Census Data.
- Cycling is currently a low choice of transport for regular journeys, even though there is high ownership among respondents. Although the figures may be low, the data shows that bicycle journeys have actually seen the largest percentage increase (28%).
- Sixty-four per cent of residents said the quality of their journey has either improved or not been affected by the scheme. Nearly 40% said the quality of their journey has decreased, but we do not have detailed information specifically as to why, although it is likely that perceptions over traffic volume, local access and journey times are a factor

Traffic changes

- Respondents felt traffic speed and noise had reduced.
- However, 31.9% said they had not seen a change in the number of vehicles, whilst 34.5% had seen a decrease and 33.6% an increase.
- Forty-five per cent of residents' overall perception of their street has stayed the same. Of the remaining 55%, there was a 50/50 spilt in respondents suggesting the perception of their street had increased, and those saying it had decreased.
- It would appear that the level of traffic on a resident's street is the main influencing factor in determining their overall perception. In Chapter 4, we look at the technical data measuring traffic volume and noise.

Orford Road area

- Overall there has been a positive response from residents to the changes in the Orford Road area.
- Many residents suggested they visit the area frequently. The primary method of travel was walking with 91% having walked there for their most recent journey.
- One hundred and seventy five households said they had increased their trips to Orford Road since the introduction of the scheme. The reasons indicated were that the scheme has created a nicer environment for pedestrians, the area is more

pleasant, there is more space to walk, better shops and restaurants, and has a more social area with a better atmosphere.

- The number of residents who said they visited the Orford Road area less frequently was low. Views that were expressed related to using motor vehicles for the trip, for example, road closures and parking restrictions.

Street lighting

- The majority of residents did not notice the change from orange lights to white lights. However, many suggested that the streets felt safer at night and that visibility had improved. This could suggest that the bright white street lighting has been successful. A small minority of residents feel that the lighting is too bright.

Residents' overall perception of the scheme

- The majority of residents feel the appearance of the local area has improved, which was one of the main aims of the project.
- The changes to the Orford Road area, introduction of traffic calming, tree planting, public spaces and parks are seen as the main benefits.
- Despite 49% of residents suggesting that road closures were the change with the lowest benefit to the area, only 17.6% expressed a desire to adjust these now that they had been implemented.
- Fifty-five per cent of residents said they would not change anything and only 1.7% said they would scrap the scheme and go back to how it was before.
- Only four (0.3%) residents mentioned emergency service access as a problem, suggesting that some of the previous concerns raised around this have been addressed, otherwise we would have expected the number to be higher.

Business survey

- Business owners were positive about the appearance of the scheme, the materials used, the Village public realm area, the street lighting, cycle parking and maintenance.
- They felt more negative towards parts of the scheme relating to directional signs, parking and loading bays.
- Over 75% of businesses gave negative feedback on the 10am to 10pm restriction.
- There were mixed responses on how businesses have been affected by the scheme, with just over half saying the number of customers had either improved or stayed the same.

- Forty-one per cent of businesses said that turnover had decreased, 23 % said they did not know if there had been a difference in turnover, compared to 36% who said it had stayed the same or increased.
- Fifty-four per cent of business owners' overall perception of the scheme was either positive or neutral. The rest (46%) were negative, suggesting that the 10am to 10pm restriction, loading and parking facilities were the main areas of concern.

On-street visitor survey

- The overall opinion from visitors towards the scheme was extremely positive, with 84% saying it was very good, and 16% good. Most respondents (94%) said they were more likely to recommend the area to someone else as a result of the changes.
- The majority of on-street visitors said they had arrived at Walthamstow Village by bus, car or tube. Low numbers said they had travelled by bicycle or walked, suggesting that at present these methods of transport are not as popular for non-local trips.
- The majority said that the changes brought about by the scheme had not led them to change their mode of transport to reach the area.
- Of the visitors interviewed, the frequency of their trips to the area was high, suggesting a large number of regular visitors. Restaurants and pubs were popular destinations as well as other retail premises. None of the on-street visitors said their number of trips to the area had decreased because of the scheme.
- The visitors interviewed were very positive about the appearance of the area, the general layout and the Village Square area. Respondents said the general environment had improved for walking and cycling, materials had improved and there was better road and traffic safety. Not many people commented on the changes to the street lighting.
- Navigating the area had become better as a result of the scheme according to 75% of visitors. This could suggest a successful way-finding strategy.
- None of the visitors suggested alterations were required.

Key stakeholders (emergency services/ schools/ interested parties)

- The emergency services support our objectives and have been involved throughout the design, development and implementation of the scheme. We will continue to work with them on all schemes.
- Residents and local community groups have noticed that traffic volume and noise have reduced on many residential roads within the Village.

- Key benefits are the re-development of Orford Road and the improved public spaces.
- The percentage of road users walking and cycling has started to increase.
- There are concerns with traffic on Vestry Road and Church Lane and reliable bus times.
- Concerns were also raised about blended 'Copenhagen' crossings, which we will continue to monitor.
- Community feedback has been incorporated into the design, for example residents were concerned when an island was removed on Shernall Street. Following the feedback a new zebra crossing was introduced.

4. TECHNICAL DATA COLLECTION

4.1 Introduction

As part of the review we carried out a series of technical data studies to quantify the impact of the scheme on the local area. The four main areas of interest are:

- Traffic data – We counted the number of vehicles and measured vehicle speeds before and after the introduction of the scheme, to understand how people drive in the area. By comparing the before and after data for each road, we can determine the areas that have been affected by a change in traffic, and to what extent.

  Please note that for East Avenue and West Avenue we used video cameras to measure traffic volume, these cameras cannot measure speed. Therefore we do not have mean speed data for East Avenue and West Avenue.

- Bus journey time data, provided by TfL, has been analysed to understand if the scheme has had an effect on the running times of local bus routes. Bus data will also help to show the impact on main roads in the area, for example, if journeys have been taking longer.

  We have also looked at other bus performance measures, such as Passenger Waiting Times and Bus Mileage, which are some of the key criteria used by TfL to monitor performance of the bus network.

- Walking and cycling – We have carried out cycle counts and junction safety assessments to see if the scheme has created high quality cycle and walking networks and if it is now easier for people to travel by bike and foot.

- Road safety – A full road safety audit has been undertaken by an independent specialist audit team, provide by Royal HaskoningDHV, this reviewed all works that formed part of the scheme. This section also includes a comparison of all recorded collision data before and after the introduction of the scheme.

Like the community feedback section (Chapter 3), the data in this chapter has been used to assess the success of meeting all fours aims:

Aim 1: Reduce rat-running traffic, noise and pollution outside people's homes within the Walthamstow Village area

Aim 2: Improve road safety on the roads within the area

Aim 3: Make it easier for people to walk and cycle around Walthamstow Village

Aim 4: Make the Village area more attractive for residents and visitors

4.2 Traffic within the Village

This section provides a comparison of two traffic count studies, undertaken with automatic traffic counts (ATC). ATCs are two rubber tubes laid across the road linked to a recorder box. These tubes measure both speed and number of vehicles. ATCs were carried out before and after the introduction of the scheme, in 2014 and 2016. The data helps to assess Aim 1: to reduce rat-running traffic and noise outside people's homes within the Walthamstow Village area. The two study periods were:

- Study one was held in September 2014
- Study two was held in June / July 2016

The two studies collected data at each of the 17 locations indicated in Figure 38. This includes 14 residential roads within the Village area and three of the surrounding roads forming the wider road network. The data collection exercise in 2016 actually included 33 locations but only 17 relate to locations where similar information was collected prior to the scheme.

The data collected includes:

- Average daily vehicle counts in both directions
- Average daily bicycle counts in both directions
- Mean vehicle speeds
- 85%ile vehicle speeds (calculated as the speed at which 85% of the counted vehicles are travelling below). The 85%ile speed is generally considered to be a more representative measure of speed as it reflects the speed at which the majority of vehicles were travelling below, rather than the average speed which can be influenced by a range of factors.

This data allows a comparison of vehicle flows on a road-by-road basis, providing an insight into how traffic volumes and behaviour have changed as a result of the scheme.

Figure 39: Map of ATC locations

4.2.1 Daily vehicle count results

Table 4 compares daily vehicle counts recorded during the 2014 and 2016 studies for each road tested within the Village area.

2014-2016 Change in daily vehicle counts within the Village area				
Road Name	2014 Daily vehicle count	2016 Daily vehicle count	Change Daily vehicle count	% Change in daily vehicle count
Addison Road	2894	2261	-633	-21.9
Beulah Road	363	459	96	26.4
Church Lane*	2166	2576	410	18.9
Copeland Road	2625	69	-2556	-97.4
Eden Road	648	52	-596	-92.0
Grove Road	3118	729	-2389	-76.6
Shernhall Street (West of Barclay Road)	4444	1340	-3104	-69.8
Grosvenor Park Road	1445	952	-493	-34.1
Orford Road	2525	579	-1946	-77.1
Pembroke Road	2618	1444	-1174	-44.8
East Avenue	2079	2912	833	40.1
West Avenue	1951	161	-1790	-91.7
St Mary Road*	617	487	-130	-21.1
Wingfield Road	996	232	-764	-76.7

Table 4: Change in daily vehicle counts within the Village area (2014 - 2016)

**Previously unpublished results*

Figure 40: Daily vehicle counts within the Village (2014)

Figure 41: Daily vehicle counts within the Village (2016)

Pre-scheme (2014) - Daily vehicle counts

Figure 40 shows an area wide distribution of daily vehicle counts before the implementation of the scheme in 2014. Grove Road is the most used east-west route, while Copeland Road - Pembroke Road - West Avenue is the busiest north-south route. Orford Road and Church Lane also form a connecting route between the boundary roads based on the high levels of observed traffic numbers.

Post scheme (2016) - Daily vehicle counts

One of the main intentions of the scheme was to reduce the number of non-local vehicles, which were using these residential routes to bypass the main roads and traffic signals.

The 2016 vehicle count data, presented in Figure 41, shows a clear reduction of motorised traffic within the Village area. The two main east-west and north-south through routes have seen significant reductions in the number of daily counted vehicles. Other roads have also reduced by high percentages, but several roads have seen an increase.

Change in daily vehicle counts

Figure 42 shows the percentage change in vehicle counts (daily average in both directions) from the 2014 study to the 2016 study.

Figure 42: Mapped percentage change in daily vehicle counts (2014 - 2016)

Eleven out of the 14 roads tested have seen significant decreases in the average number of daily vehicles. Based on the data, on average, a road within the Village saw a 44.1% reduction in traffic.

Grove Road, Pembroke Road, Copeland Road and West Avenue were previously highlighted as main through routes in the area. These roads saw significant reductions in traffic volume since introducing the scheme. This includes a 97% reduction in Copeland Road, 70% in Grove Road and 45% in Pembroke Road.

In contrast, Church Lane, Beulah Road and East Avenue saw some increases in vehicle counts. This suggests that some traffic has shifted to these roads since introducing the scheme.

4.2.2 Church Lane and East Avenue vehicle counts

Following the introduction of the scheme, Church Lane and Vestry Road via the southern section of East Avenue and Third Avenue is the only remaining route that enables vehicles to travel from east to west across the Village. This is likely to explain why these roads have attracted some additional traffic. In Church Lane the post scheme vehicle counts rose by 18.9% (equivalent to 410 additional vehicles per day).

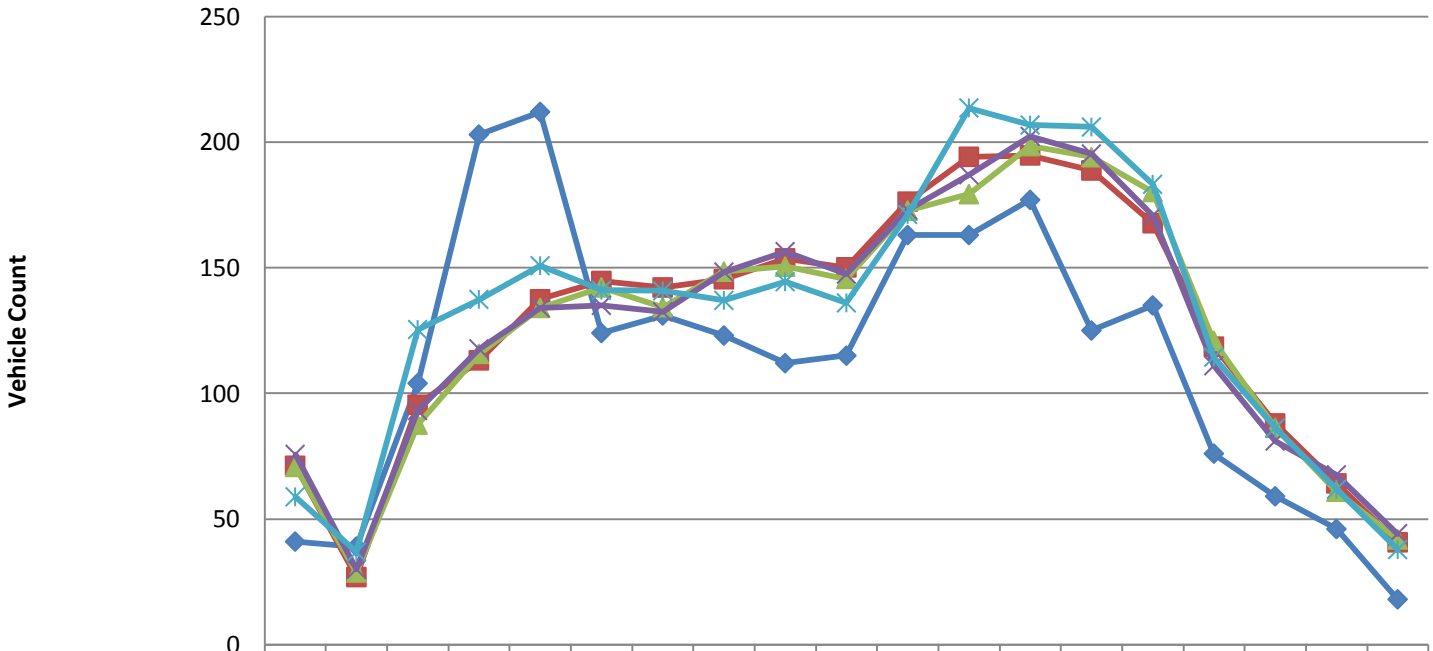
In East Avenue, between its junctions with Church Lane and Orford Road, there has been an increase in traffic of 40.1% (equivalent to 833 additional vehicles per day. As this forms part of the remaining route that enables vehicles to travel east to west across the Village we expect to see similar changes to Church Lane. However, there are additional vehicle movements using East Avenue which we believe are using this road to access the short stay parking bays to visit the shops, East Avenue Mosque or as a turnaround point to avoid the Orford Road restrictions.

In response to local concerns, and in order to reduce peak morning traffic on this route, we introduced a right turn restriction at the junction of Shernhall Street and Church Lane after the main scheme works were complete. This prevents vehicles travelling southbound on Shernhall Street from making a right turn into Church Lane during the hours of 8am to 9.30am, Monday to Saturday.

Error! Reference source not found. shows a comparison of the hourly traffic counts on hurch Lane before and after introducing the scheme and the right turn ban.

Despite an overall increase in traffic volume (Table 4), the additional traffic spreads throughout the day, with fewer observed peaks in volume. There is a clear reduction in traffic volume during the morning peak hours of 7am to 10am. In the pre-scheme survey during this three-hour period the count was 519 vehicles, compared to 388 post scheme. This is equivalent to a 25.2% reduction in traffic volume during the morning peak.

Due to the continued concerns raised by residents in the area, additional traffic surveys have been undertaken along Church Lane for a four-week period between 22nd February and 21st March 2017. The graph below shows a weekly average of each of the four weeks in comparison to traffic levels prior to the scheme.



	12am-6am	6am-7am	7am-8am	8am-9am	9am-10am	10am-11am	11am-12pm	12pm-1pm	1pm-2pm	2pm-3pm	3pm-4pm	4pm-5pm	5pm-6pm	6pm-7pm	7pm-8pm	8pm-9pm	9pm-10pm	10pm-11pm	11pm-12am
Before	41	39	104	203	212	124	131	123	112	115	163	163	177	125	135	76	59	46	18
W/C 22nd Feb	71	27	95	113	137	145	142	145	154	150	176	194	195	189	168	119	88	64	41
W/C 1st March	71	29	88	116	134	142	134	148	150	146	173	179	198	194	180	121	86	61	42
W/C 8th March	76	30	93	118	134	135	132	148	156	147	173	187	202	195	171	111	81	68	44
W/C 15th March	59	37	125	137	151	141	141	137	144	136	171	214	207	206	183	114	86	62	38

Figure 43: Comparison of hourly vehicle counts on Church Lane pre-scheme and for a four-week period starting on 22nd February 2017

The four-week break down shows a similar pattern to the post scheme traffic counts completed in June and July 2016 with the additional traffic distributed throughout the day and fewer observed peaks in traffic volume. There is a clear reduction in the amount of

traffic during the AM peak hours of 7am to 10am. In the pre-scheme survey the count was 519 vehicles compared to 360 average during this four week period post scheme. This is equivalent to a 44.1% reduction in traffic volume during the morning peak.

Although the right turn ban has accomplished a reduction in vehicle movements, concerns were raised during a number of the community meetings about vehicles on Shernhall Street undertaking a U-turn south of the Church Lane junction to avoid the right turn ban and this will need to be looked at further as part of a separate review of the Shernhall Street corridor scheme.

Despite the apparent reduction in morning peak traffic it is acknowledged that outside of the morning peak and over the course of the day there continues to be a higher level of traffic using Church Lane than pre-scheme. In the pre-scheme survey the average total vehicle movement was 2,166, and in the post scheme surveys the average was 2,445. This is an increase of 279 vehicle movements per day.

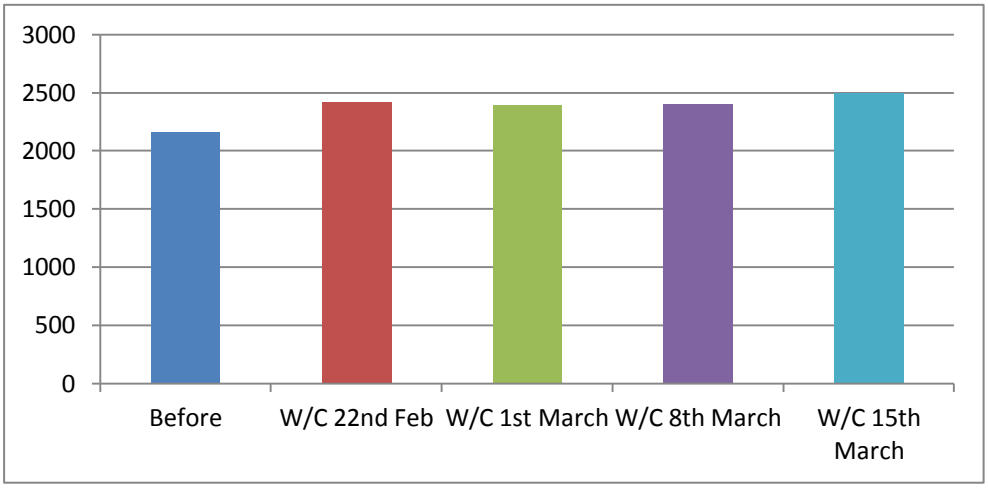


Figure 44: Comparison of total vehicle counts on Church Lane pre-scheme and for a four-week period starting on 22nd February 2017

4.2.3 Beulah Road

The daily vehicle counts on Beulah Road have increased from 363 to 459, which is an additional 96 vehicles per day, or six vehicles per hour based on a 18 hour operational day. The new road layout, in particular the directional change of the one-way in Beulah Road, does not make it a beneficial cut through for those travelling on the main roads or looking to bypass any congestion at junctions. This is why Beulah Road continues to be one of the quietest roads for traffic volume within the Village. It is therefore unlikely the Beulah Road is being used by through traffic and so it is assumed the additional vehicle movements have come from residents accessing local amenities including the school, medical centre and short stay bays for visiting Orford Road shops. As such any further works to restrict vehicle movements on this road would not be me meeting any of the four aims of the project but only disadvantage local movement.

4.2.4 Mean vehicle speed results

Table 5 provides a comparison of mean vehicle speeds within the Village from the 2014 and 2016 studies. This section looks to identify if the scheme has addressed Aim 2: improving road safety on the roads within the area. Twelve of the 14 roads have been included in the results. Mean vehicle speed data was not available for East Avenue and West Avenue as we used video cameras to measure the volume of traffic as well as to accurately record pedestrian and cycle volumes in this area, and video cameras cannot measure speed.

Table 5 shows the distribution of mean vehicle speeds within the Village area during the 2014 and 2016 studies. These speeds are daily averages in both directions of travel (where applicable).

2014 – 2016 Change in mean vehicle speeds within the Village area				
Road Name	2014 Mean speed	2016 Mean speed	Change Mean speed	% Change Mean Speed
Addison Road	15.9	16.9	1	6.3
Beulah Road	12.9	14.5	1.6	12.4
Church Lane	14.9	14.5	-0.4	-2.7
Copeland Road	14.7	12.9	-1.8	-12.2
Eden Road	16.9	13.7	-3.2	-18.9
Grove Road	22.1	16.3	-5.8	-26.2
Shernhall Street (West of Barclay Road)	17.8	17.3	-0.5	-2.8
Grovsenor Park Road	19.8	16.7	-3.1	-15.7
Orford Road	18.7	13.95	-4.75	-25.4
Pembroke Road	18.6	16.9	-1.7	-9.1
St Mary Road	13.8	12.6	-1.2	-8.7
Wingfield Road	18.5	14	-4.5	-24.3
Average*	17.7	15.8	-1.9	-10.5%

Table 5: 2014 - 2016 Change in mean vehicle speeds within the Village area

**Average has been weighted based on number of vehicle counts recorded on each road*

Figure 45: Vehicle Mean speeds (daily average) within the Village (2014)

Figure 46: Vehicle Mean speeds (daily average) within the Village (2016)

Pre-scheme (2014) - Mean vehicle speeds

The range of 2014 mean speeds in Figure 45 is widely spread, ranging between 12.9mph and 22.1mph. The majority of roads are operating with an average speed below their 20mph speed limit, but the west side of Grove Road is above the limit at 22.1mph. It is generally undesirable for mean speeds to be so close to the speed limit as this implies that a high percentage of vehicles are travelling above the 20mph limit.

Post scheme (2016) - Mean vehicle speeds

In Figure 46, the 2016 study, the majority of roads have seen a reduction in vehicle speed, and none of the tested roads registered mean speeds above the 20mph limit.

The distribution of speed is more consistent, with all roads now having a mean speed between 12.6mph and 17.3 mph.

Figure 437: Percentage change of mean speed within the Village (2014-2016)

4.2.5 85th Percentile Speeds

The 85th percentile speed is the speed at which 85% of the counted vehicles are travelling below. This can give a more accurate representation of whether motorists are obeying the 20mph speed limit in the Village area.

If the recorded 85th percentile speed is 20mph for a certain road, this means that 85% of the recorded vehicles were travelling at a speed less than or equal to 20mph, and 15% were travelling at a speed above.

Table 6 shows the distribution of the 85th percentile vehicle speeds within the Village area during the 2014 and 2016 studies. These speeds are daily averages in both directions of travel (where applicable).

2014 – 2016 Change in 85%ile vehicle speeds within the Village area				
Road Name	2014 85%ile speed	2016 85%ile speed	Change 85%ile speed	% Change 85%ile speed
Addison Road	18.7	21.3	2.6	13.9
Beulah Road	15.5	18.0	2.6	16.5
Church Lane	17.5	17.9	0.4	2.6
Copeland Road	19.0	16.1	-2.9	-15.3
Eden Road	21.3	16.9	-4.4	-20.7
Grove Road	26.8	20.0	-6.8	-25.2
Shernhall Street (West of Barclay Road)	22.0	20.9	-1.1	-4.8
Grovsenor Park Road	24.7	20.1	-4.6	-18.6
Orford Road	21.9	17.8	-4.1	-18.7
Pembroke Road	23.4	20.6	-2.8	-12.0
St Mary Road	16.6	15.3	-1.3	-7.6
Wingfield Road	23.2	17.1	-6.1	-26.1
Average*	21.6	19.5	-2.1	-9.7%

Table 6: 2014 – 2016 Change in 85th percentile vehicle speeds within the Village area

**Average has been weighted based on number of vehicle counts recorded on each road*

Figure 448: 85%ile speeds (daily average) within the Village area, 2014 study

Figure 459: 85th percentile speeds (daily average) within the Village area, 2016 study

4.2.6 Pre-scheme (2014) - 85th Percentile Speeds

As shown in Figure 48, the measured 85th percentile speed for each road from the 2014 study shows that many roads were operating with 85th percentile speeds above the 20mph limit. This suggests that more than 15% of vehicles were breaking the 20mph limit on a daily basis during the 2014 study period.

The 85th percentile speeds were particularly high in the area surrounding Grove Road and Grosvenor Park Road. Beulah Road was operating quite slowly, with 85% of recorded vehicles travelling at a speed below 11mph, suggesting it was primarily used by residents and/or people looking for parking spaces.

4.2.7 Post scheme (2016) - 85th Percentile Speeds

The 85th percentile speeds in 2016 (Figure 49) are less spread out, with the majority of roads below, or very close to the 20mph limit. The roads where the previously recorded speeds were higher (e.g. those surrounding Grove Road and Grosvenor Park Road) have all seen a reduction in the 85th percentile speed. This brings them closer to the 20mph limit. This means that on average, the number of vehicles travelling above the 20mph limit has reduced.

Figure 50: Percentage change in 85th percentile speeds within the Village, 2014 - 2016

4.2.8 Change in 85th Percentile Speeds

Figure 50 shows the average 85th percentile speed across the 12 tested roads (weighted for traffic volume) fell from 21.6mph to 19.5mph between the two studies.

Grove Road and Wingfield Road saw the largest decreases, with previously high 85th percentile speeds reducing to a level within the 20mph speed limit.

Addison Road and Beulah Road saw slight increases in the 85th percentile speed, with Addison Road recording an 85th percentile speed just above the 20mph limit in 2016. However, the increase in Beulah Road's 85th percentile speed is still below the 20mph speed limit at 18mph, up from 11mph.

The overall reduction in 85th percentile speed suggests an increase in road safety, particularly on the previously identified through routes.

4.2.9 Summary of vehicle flow within the Village

The key findings of the traffic surveys show that:

- The number of vehicle movements has significantly decreased on the majority of roads. This includes over 90% reductions in Copeland Road, Eden Road and West Avenue.
- The average road within the Village saw a 44.1% reduction in vehicle numbers.
- Vehicle movements have increased within Church Lane and East Avenue as vehicles travel east-west through the Village area. However, since the introduction of the scheme and the right hand turn ban vehicle numbers have reduced by approximately 25% during the morning peak between 7am to 10am.
- Due to local resident concerns, a further four-week survey was undertaken in February and March 2017 in Church Lane. The results were similar to the first set of data collected with an overall increase in vehicles during the day, but with lower vehicles numbers during the morning peak.
- Average vehicle speeds have decreased throughout the area, both in the mean speeds and 85th percentile speed. The average 85th percentile speed reduced from 21.6mph to 19.5mph.

4.3 Traffic outside the Village

One of the concerns expressed by some residents was that there would be heavy displacement of traffic onto the main arterial routes within the area.

The three roads surrounding the Village scheme are:

- Hoe Street
- Lea Bridge Road
- Shernhall Street.

Of the three roads, Hoe Street and Lea Bridge Road form part of the borough's, and London's, "A" road network. One of the primary functions of the main arterial routes within Waltham Forest, like all boroughs, towns and cities, is to carry through traffic and act as distributors for longer journeys, as well as serving local residential areas and neighbourhoods. These roads are typically designated as part of the UK's "A" road network and are key routes for Heavy Goods Vehicles and Public Transport Services.

Characteristically these roads tend to be wider than most residential streets, with properties further set back away from the carriageway, and while these roads do often contain some residential properties land use is generally mixed with higher proportions of retail, commercial and industrial use. Overall the design, layout and land use of the arterial road network means that vehicle capacity is higher and these roads are generally more suited to the movement of high vehicle numbers.

The next section examines the impact on the three roads surrounding the Village to see how the road network is performing following the introduction of the scheme. In order to make this assessment we have looked at three key indicators:

- Volume of traffic
- Speed of traffic
- Bus performance in the area.

4.3.1 Change in daily traffic counts

As part of the two studies undertaken in September 2014 and June/July 2016, ATCs were taken on each of the boundary roads, the locations of which can be seen in Figure 38.

When comparing the traffic count data from the two studies there was an observed increase in traffic volume on the three surrounding roads (Table 7).

2014 - 2016 Boundary Roads – Average daily vehicle counts				
Road Name	Pre-scheme (2014) Daily vehicle count	Post scheme (2016) Daily vehicle count	Change daily vehicle count	% Change daily vehicle count
Hoe Street	15624	16025	401	2.6
Lea Bridge Road	15007	16674	1667	11.1
Shernhall Street	7231	9276	2045	28.3

Table 7: Average daily vehicle count comparison - Boundary roads - 2014 to 2016

Figure 51: Percentage change in daily vehicle counts - Boundary roads - 2014 to 2016

As shown in Table 7 and figure 51, Hoe Street and Lea Bridge Road saw percentage changes of +2.6% and +11.1% respectively. Shernhall Street saw a greater percentage increase of 28.3% (Table 7).

A key long-term aim of the Enjoy Waltham Forest programme is to reduce vehicle movement on residential roads and encourage residents to make shorter journeys by walking or cycling where possible. Before the introduction of the scheme vehicle movements in the Village were made up of a combination of journeys including those making short trips to local amenities, travel to nearby schools, local residents travelling to work, and those undertaking longer trips which were travelling through the residential streets rather than using the main road network.

The scheme has been designed to make it safer and easier to undertake journeys by sustainable means and we are encouraging shorter trips to be taken in this way. However, we accept that longer journeys that involve travelling through the borough will continue to be completed by motor vehicles and will now use the A roads like Lea Bridge Road and Hoe Street. Therefore while we have seen some increase in walking and cycling for shorter journeys in the area there has been an increase in those using the main roads as seen in the traffic figures.

In the longer term as we develop up improved sustainable travel options across the borough within the Enjoy Waltham Forest programme we aim to change travel patterns on a larger scale enabling a high modal shift towards sustainable travel choices. This in turn will hopefully reduce traffic volumes on all of our roads, but behaviour change of this scale is a long-term goal and unfortunately will not happen overnight.

We do however understand the importance of the main road network and the need for it to run effectively in the short and long term. Therefore, in order to assess the impact of these changes on periods of peak traffic, and further understand how this traffic has changed throughout the day, a more detailed analysis of hourly traffic counts has been undertaken.

4.3.2 Lea Bridge Road - Hourly traffic data

Figure 52 shows the hourly traffic counts on Lea Bridge Road observed during the pre-scheme and post scheme study periods. The post scheme study shows a more even distribution of traffic with fewer fluctuations in traffic volume throughout the day. During the majority of the morning and afternoon peak periods there were fewer recorded vehicle counts in the 2016 study compared to 2014. The highest observed hourly peak was 940 vehicles between 1pm to 2pm in the post scheme study. Prior to the scheme (2014), the hourly peak was between 5pm to 6pm with 1,036 vehicles. In general, the maximum hourly traffic volume has reduced since the introduction of the scheme, but traffic appears more spread out across the day and into the evening.

The automatic traffic counters are an industry standard for recording vehicle movements on any particular point of the road network. Although every effort is made to ensure the counts reflect the volume of traffic, sometimes there are anomalies in the data. There is one anomaly observed between 11am and 12pm in the 2014 data. This does not match

the trends observed on Hoe Street or Shernhall Street, and could suggest an issue with the counter, for example if a vehicle is parked on the equipment this could skew the data.

Rather than assuming the 11am – 12pm count is incorrect we have reported the data as received. If the 11am – 12pm count is incorrect then the total number of vehicles in 2014 is actually higher than shown in Figure 52, which means that the percentage increase in daily count (Table 7) would actually be smaller.

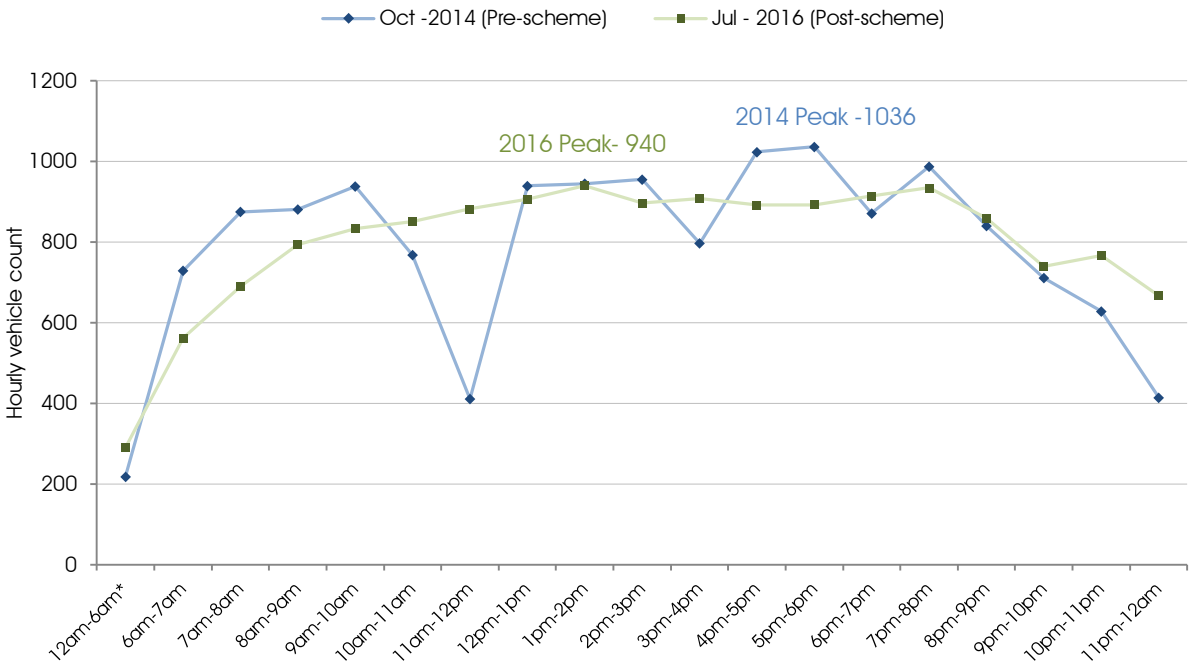


Figure 52: Lea Bridge Road - Hourly vehicle counts (2014 – 2016)

4.3.3 Hoe Street – Hourly traffic data

Figure 53 shows the hourly traffic counts on Hoe Street, observed during the pre-scheme and post scheme study periods. The post scheme vehicle counts follow a similar pattern to those observed pre-scheme. However, hourly vehicle counts on Hoe Street were lower during the 2016 study for the majority of the day from 6am to 7pm, but increased slightly during the evening. The maximum number of hourly vehicles was 924 in 2016 at 7pm to 8pm compared to a pre-scheme peak of 940 in 2014 at 9am to 10am.

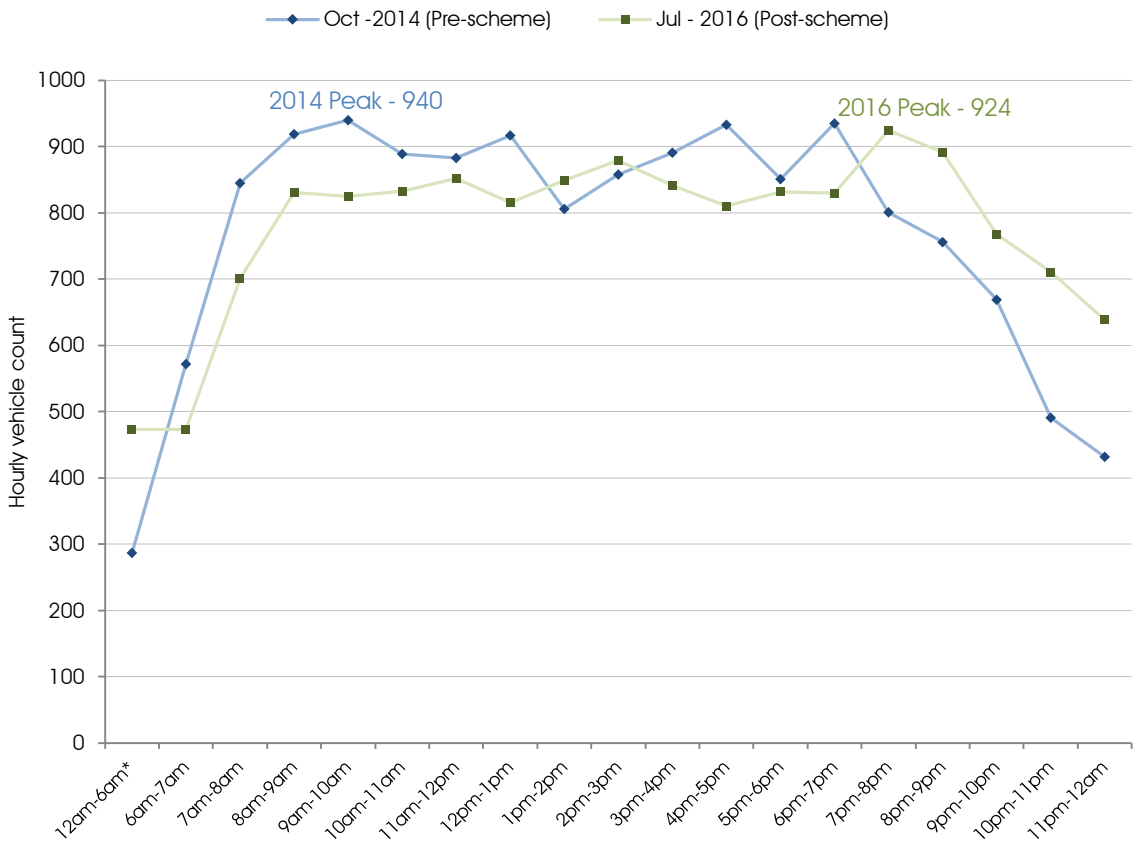


Figure 53: Hoe Street - Hourly vehicle counts (2014 - 2016)

4.3.4 Shernhall Street – Hourly Traffic data

Figure 54 shows the hourly traffic counts on Shernhall Street, observed during the pre-scheme and post scheme study periods. The post scheme vehicle counts appear to follow a more distributed pattern with fewer extreme peaks in traffic.

There has been an overall increase in the number of vehicles using Shernhall Street, however the additional vehicles are distributed more broadly across the day and throughout the evening. This could be due to a change in travel behaviour, for example people taking different routes or travelling at different times, as well as more local residents needing to use Shernhall Street to access their properties. While overall traffic levels have increased in Shernall Street there appears to have been a decrease in the number of vehicles observed between 8am to 9am and 3pm to 4pm, which coincides with the main school start and finish times.

The 2014 peak observed 902 vehicles per hour between 8am to 9am, whereas the highest number of vehicles in one hour in the post scheme study was 663 between 4pm and 5pm.

This shows the majority of the 28% increase in the number of vehicles has occurred during the evening period, while daytime traffic levels stayed consistent, possibly indicating that these journeys are made by local residents who now have to access the Walthamstow Village area differently to before.

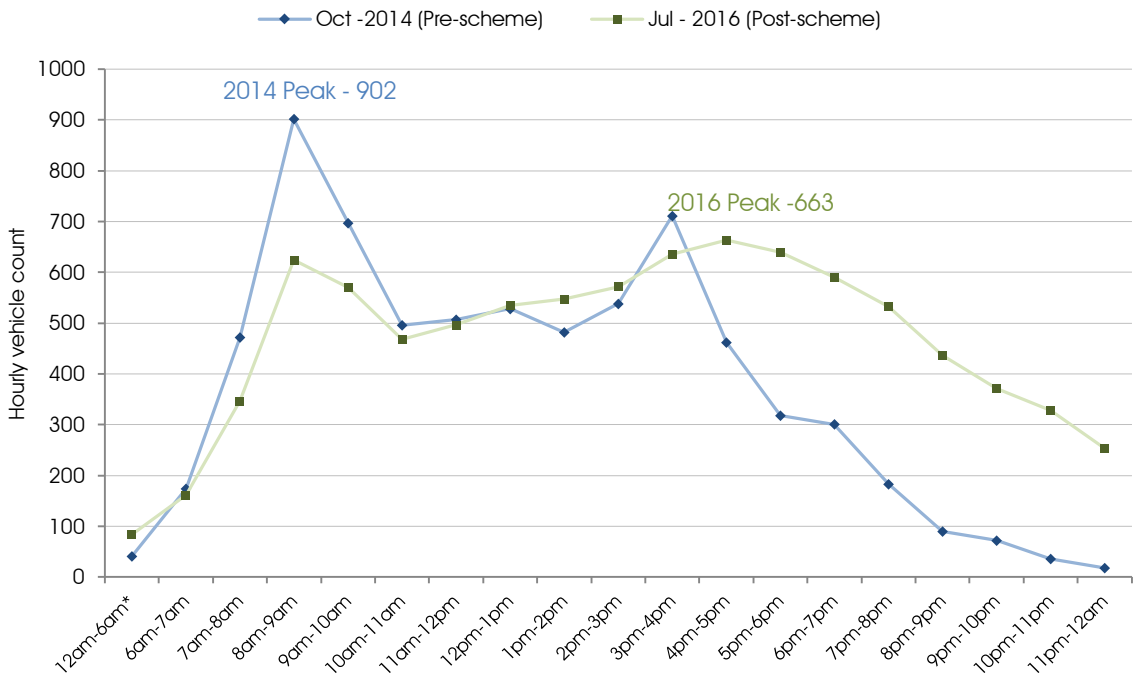


Figure 546: Shernhall Street - Hourly vehicle counts (2014 - 2016)

4.3.5 85th percentile speeds on surrounding roads

Table 8 and Figure 55 shows the 85th percentile speeds of the three boundary roads, before and after the implementation of the scheme.

2014 - 2016 Boundary Roads – 85%ile speeds				
Road Name	Pre-scheme (2014) 85%ile speed (mph)	Post scheme (2016) 85%ile speed (mph)	Change 85%ile speed (mph)	% Change 85%ile speed (mph)
Hoe Street (30mph zone)	21.6	21.6	0	0.0
Lea Bridge Road (30mph zone)	27.7	24.3	-3.4	-12.3
Shernhall Street (20mph zone)	25.5	23.9	-1.6	-6.3

Table 8: Comparison of 85%ile speeds - Boundary roads - 2014 – 2016

The locations of the vehicle counters on Lea Bridge Road and Hoe Street were within 30mph zones (at the time of the study), while the location on Shernhall Street was within a 20mph zone.

The pre-scheme (2014) 85th percentile speeds on Hoe Street and Lea Bridge Road were both lower than the 30mph speed limits. However, Shernhall Street's 85th percentile speed was above its 20mph limit at 25.5mph.

After the introduction of the scheme, speeds reduced on Lea Bridge Road and Shernhall Street. Although Shernhall Street has seen an improvement in terms of lower vehicle speeds, it still recorded an 85th percentile speed of 3.9mph above its 20mph speed limit, and ideally a further reduction in speed would be desirable. The 85th percentile speed on Hoe Street remained the same between the two studies, showing no adverse effects since the scheme came in.

It is worth noting that since these traffic surveys were undertaken before further changes were implemented on Shernhall Street to reduce vehicle speed. These have included widening pavements - which has reduced the road width, new pedestrian crossings and public space enhancements. The Shernhall Street improvements were delivered as part of the Hoe Street and Wood Street area scheme and further, separate monitoring of this project is currently in progress.

Figure 55: Comparison of 85th percentile speeds for boundary roads - 2014 to 2016

4.3.6 Mean speeds on surrounding roads

Table 9 and Figure 56 shows the mean speeds of the three boundary roads (Hoe Street, Lea Bridge Road and Shernhall Street), before and after the implementation of the scheme.

2014 - 2016 Boundary Roads – Mean speeds				
Road Name	Pre-scheme (2014) Mean speed (mph)	Post scheme (2016) Mean speed (mph)	Change Mean speed (mph)	% Change Mean speed
Hoe Street (30mph zone)	16.4	16.5	0.1	0.6
Lea Bridge Road (30mph zone)	22.4	18.3	-4.1	-18.3
Shernhall Street (20mph zone)	20.8	20.1	-0.7	-3.4

Table 9: Comparison of mean speeds - Boundary roads - 2014 – 2016

The mean vehicle speeds recorded on Lea Bridge Road and Shernhall Street have reduced. There has been a slight increase on Hoe Street but this remains well under the 30mph speed limit. Although Shernall Street has seen a reduction in speed, it remains slightly above the 20mph speed limit. It is hoped that further monitoring of the Shernhall street improvements now they are complete will show a further reduction in vehicle speeds.

Traffic speeds are important as speed has been identified as a key contributing factor in road traffic injuries, influencing both the risk of a road collision as well as the severity of the injury that results from that collision. Small differences in speed can make big difference to chances of an injury occurring and the injuries causing a fatality. The World Health Organisation states, "an increase in average speed of 1km/h typically results in a 3% higher risk of a collision involving injury, with a 4-5% increase for collisions that results in fatalities".

Figure 56: Comparison of mean speeds for boundary roads - 2014 to 2016

4.3.7 Summary of traffic data on surrounding roads

- The surrounding roads of Hoe Street, Lea Bridge Road and Shernhall Street have seen a rise in traffic levels between 2014 and 2016. Hoe Street saw an increase of 401 vehicles but the biggest increase was 2,045 vehicles a day in Shernhall Street.
- On Shernhall Street, despite the overall increase in vehicle numbers, an hourly breakdown of the data shows the two large peaks in traffic movements observed pre-scheme have reduced from 902 vehicles per hour, to 663 vehicle per hour. The overall increase in vehicle numbers has come from motorists using Shernhall Street more in the evening.
- Similar patterns of reduced peak hourly traffic were recorded on both Hoe Street and Lea Bridge Road.
- Both 85th percentile and mean vehicle speeds on the surrounding roads have generally reduced.
- In order to understand the impact of changing traffic volumes on journey times and the impact on those using the roads, we have reviewed the performance of the bus network on these roads. The results of which can be seen in the next section.

4.4 Bus performance

In order to try to assess the impact the Walthamstow Village changes have had on the wider road network and how this has affected those travelling on these roads, we have looked at the performance of the bus network. There are ten bus routes and two night bus routes on the road surrounding the village, while the W12 operates through the Walthamstow Village area. One of the key factors that influence bus performance is congestion and an increase in vehicle numbers on the route. Due to the number of bus routes running on the surrounding roads any changes in bus performance before and after the implementation of the scheme will give us an indication of the overall performance of the wider road network.

TfL has a number of key bus journey performance indicators, which are:

- **Journey times:** this is the average time taken to complete the route or travel between two points.
- **Excess waiting times**: this is the average time passengers wait over and above what would have been expected if the service was running exactly as scheduled. This excess waiting time is a key indicator of good performance and one of TfL's primary bus performance measures.
- **Percentage of completed mileage** : This is the measurement of how many kilometres a bus on a route has actually completed over a given period of time. This is then compared to the distance they should have completed if all schedule buses ran their full routes during the same period. The scheduled Kilometres may not be met because services are curtailed early, cancelled or suspended due to:
    - Traffic congestion
    - Staff availability
    - Engineering problems or mechanical breakdown

The data used to assess the performance indicators has come from the quarterly reports published by TfL. However, in addition to this we requested further data in two different forms:

- Before and after journey time data over large sections of certain routes that passed through or near to the area
- Before and after journey time data in short sections near the scheme area for certain routes.

Figure 57 shows a map of the main bus routes in the area that have been analysed as part of this review.

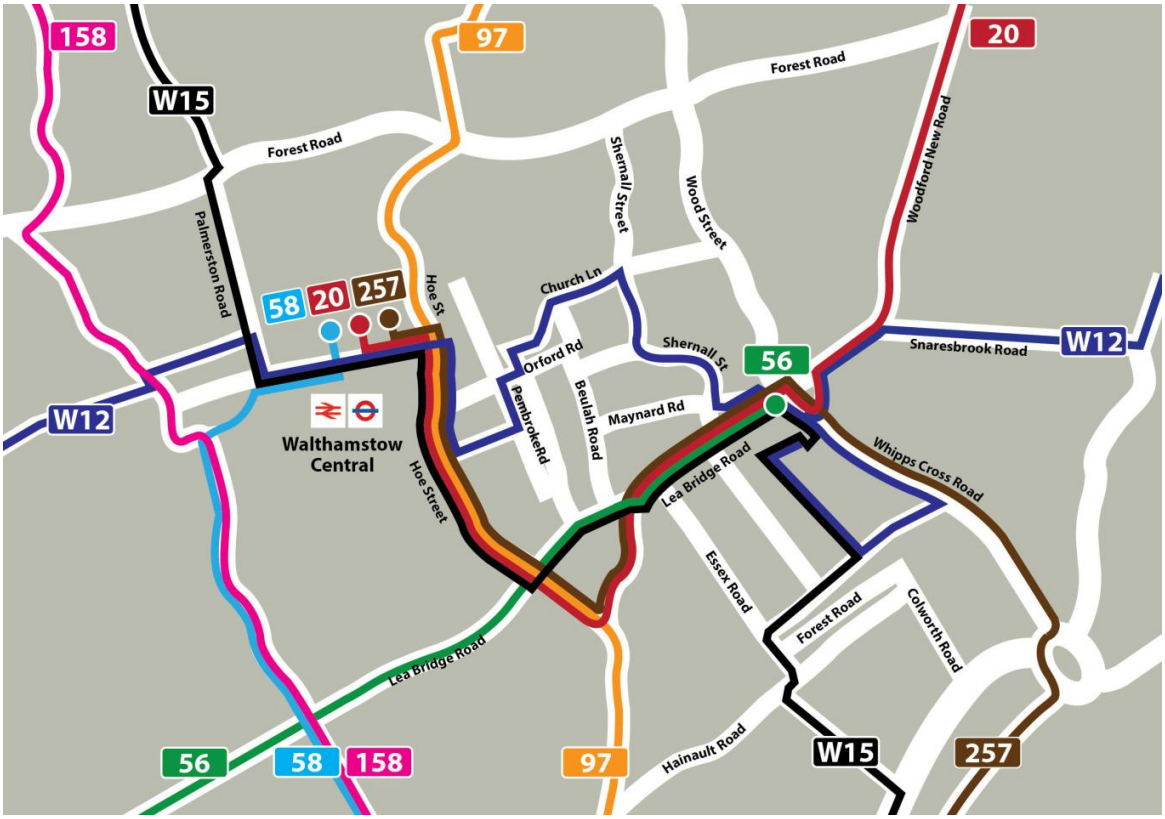


Figure 57: Map of TfL bus routes surrounding the Walthamstow Village area

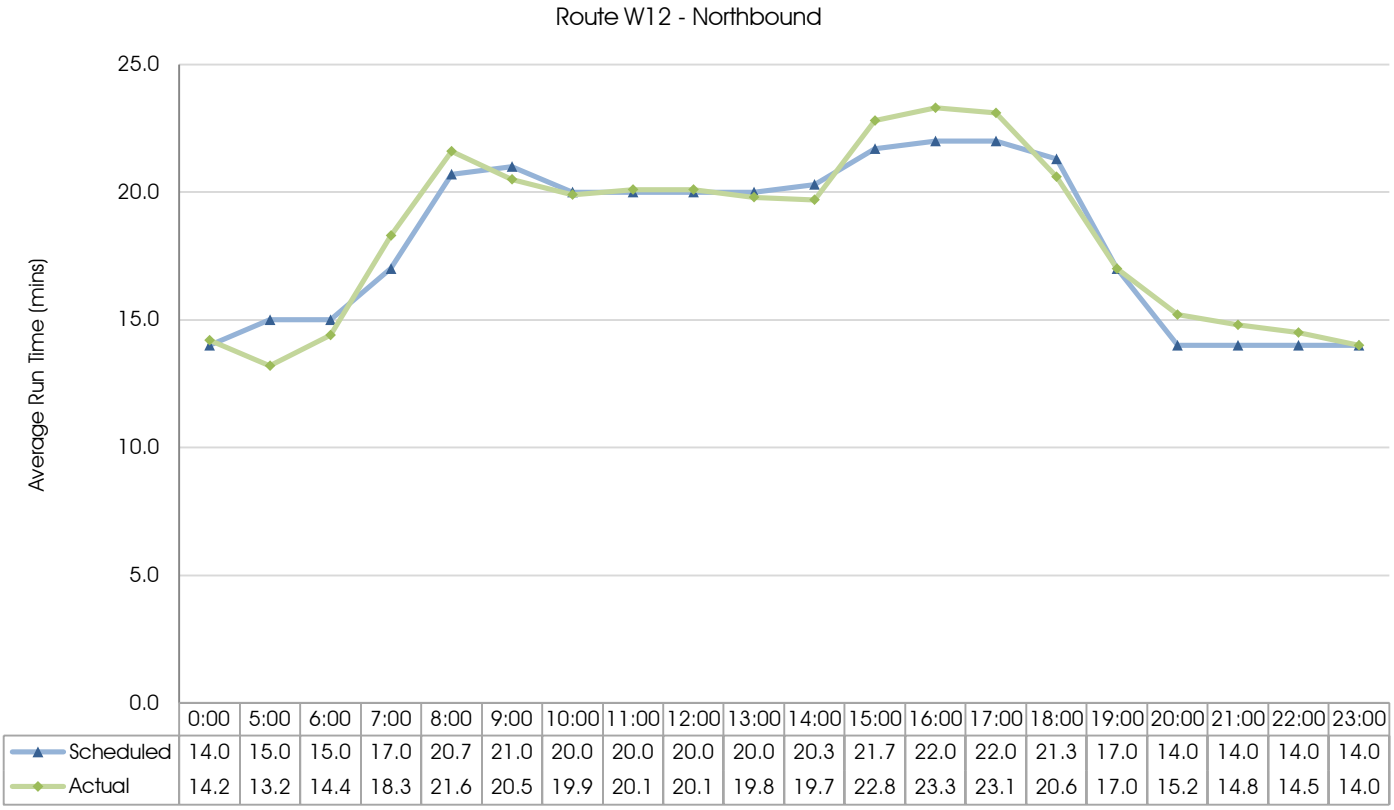
4.4.1 Within the Village - W12 bus route

Prior to looking at the wider network, one bus route, the W12, runs through the middle of the scheme as well as on the surrounding road of Shernhall Street. Therefore, we have collected data on the route for each of the TfL key performance indicators (journey times, excess waiting times and percentage of mileage completed).

4.4.2 W12 journey times

Firstly, to look at the performance of the W12, TfL have provided us with data on the actual journey times and the scheduled journey times between 18 October 2015 and 17 October 2016. This gives us the average time it has taken buses between Rensburg Road (Coppermill Lane area) and Whipps Cross Hospital in both directions. Figure 58 compares the scheduled bus journey times against the actual journey times based on each hour of the day.

The journey times for the W12 were very close to the scheduled values with a high percentage of buses on the northbound route running within a minute of their scheduled operation time. The southbound route has a slight increase during the PM peak of around three minutes across the full route, otherwise it remains close to the scheduled times.



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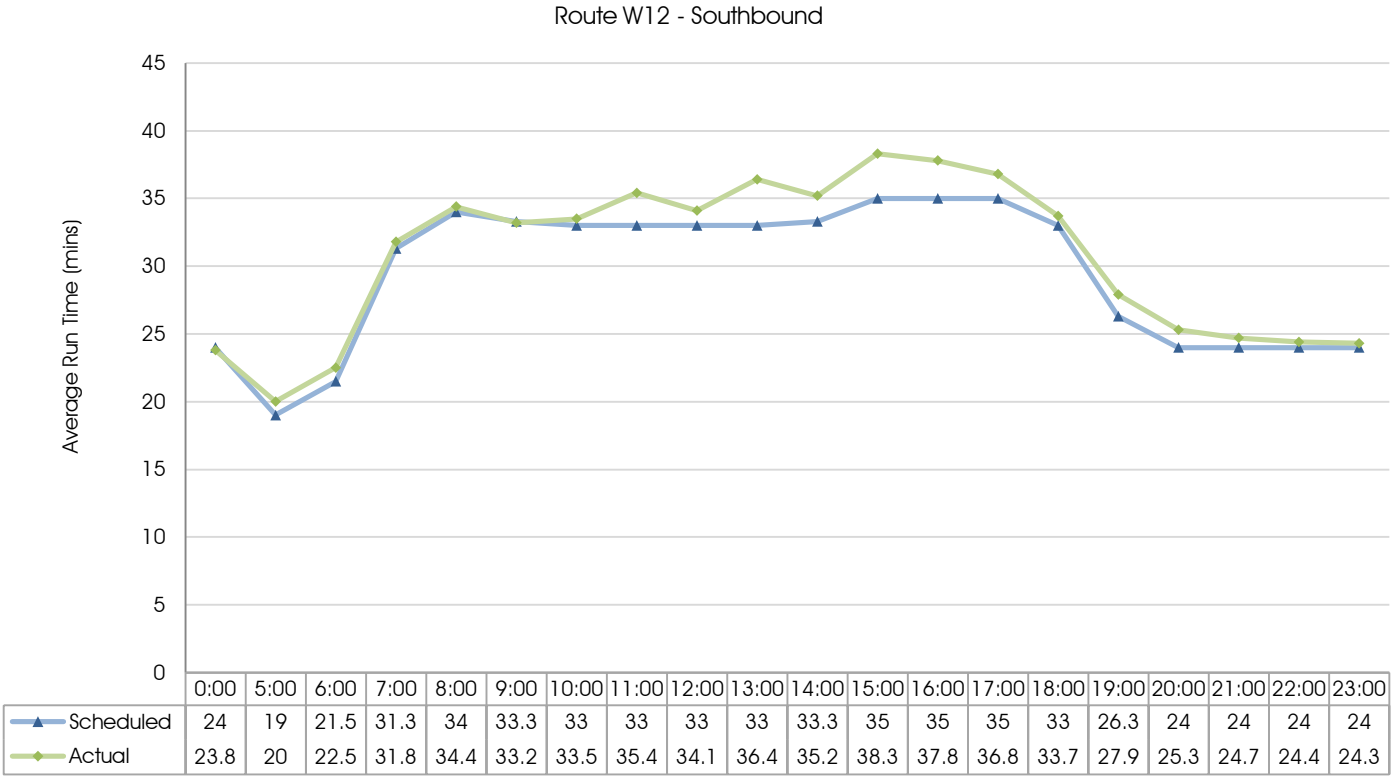
Scheduled	14.0	15.0	15.0	17.0	20.7	21.0	20.0	20.0	20.0	20.0	20.3	21.7	22.0	22.0	21.3	17.0	14.0	14.0	14.0	14.0
Actual	14.2	13.2	14.4	18.3	21.6	20.5	19.9	20.1	20.1	19.8	19.7	22.8	23.3	23.1	20.6	17.0	15.2	14.8	14.5	14.0



	0:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Scheduled	24	19	21.5	31.3	34	33.3	33	33	33	33	33.3	35	35	35	33	26.3	24	24	24	24
Actual	23.8	20	22.5	31.8	34.4	33.2	33.5	35.4	34.1	36.4	35.2	38.3	37.8	36.8	33.7	27.9	25.3	24.7	24.4	24.3

Figure 58: Comparison of actual and scheduled bus run times - Route W12 (Post scheme)

4.4.3 Excess waiting time

On low frequency routes, such as the W12, TfL use the percentage of buses departing on time rather than excess time a passengers waits for a bus as an indicator. This is because a low frequency bus route generally runs four or fewer buses an hour and passengers using this service is more likely to use a timetable. This means it is more important that services run on schedule, hence the use of this for a key performance indicator.

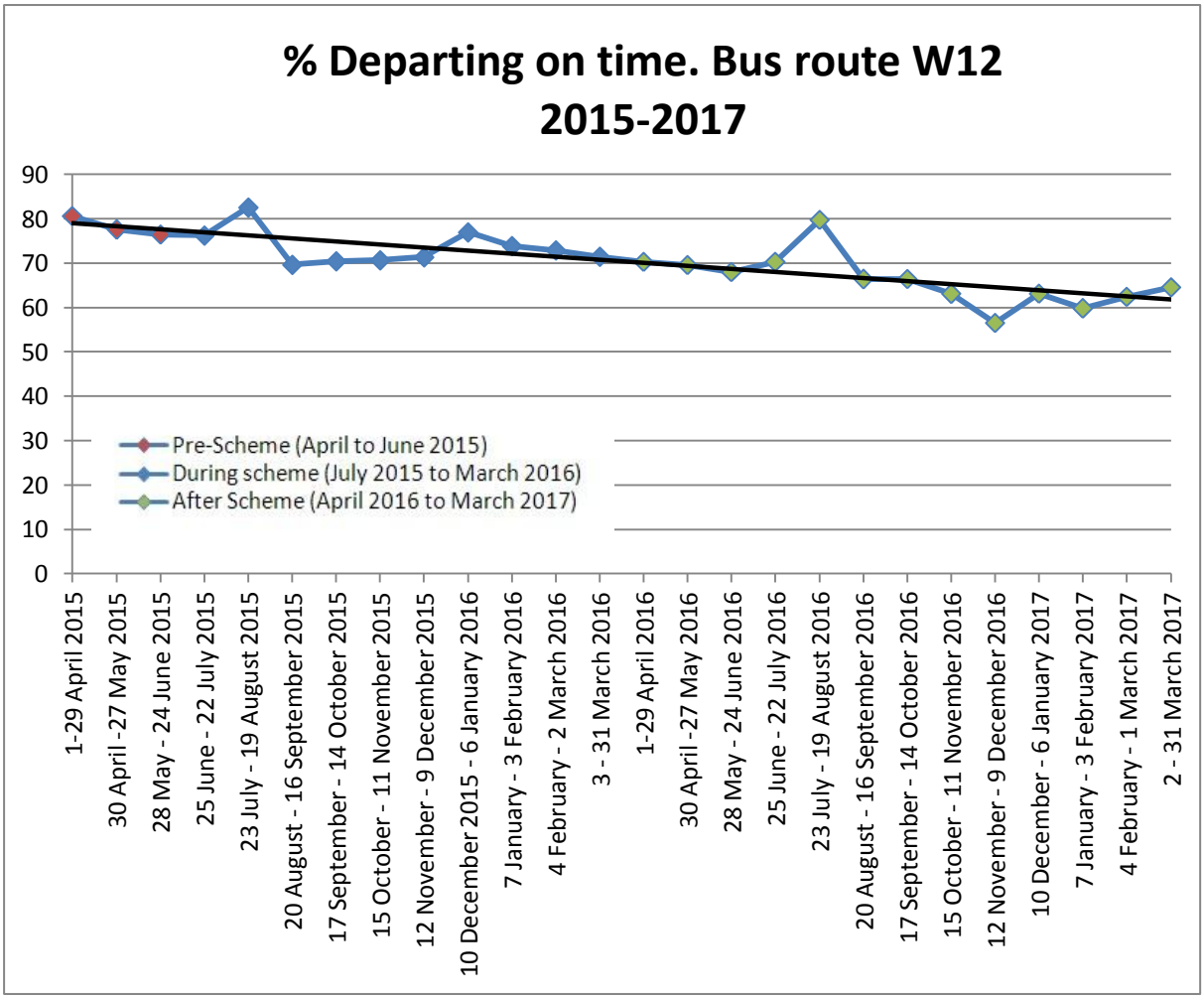


Figure 59: Percentage of W12 bus departing on time from April 2015 to April 2017

Figure 59 shows the percentage of W12s departing on time has dipped slightly since the introduction of the Walthamstow Village. This would suggest that there has been a change along the route which is affecting the route performance. This may or may not be within the Village as these figures represent the whole route but is a useful indicator to suggest that we need to work with TfL closely to understand what issues are affecting performance on the W12 and how these can be resolved.

4.4.4 Percentage of mileage completed

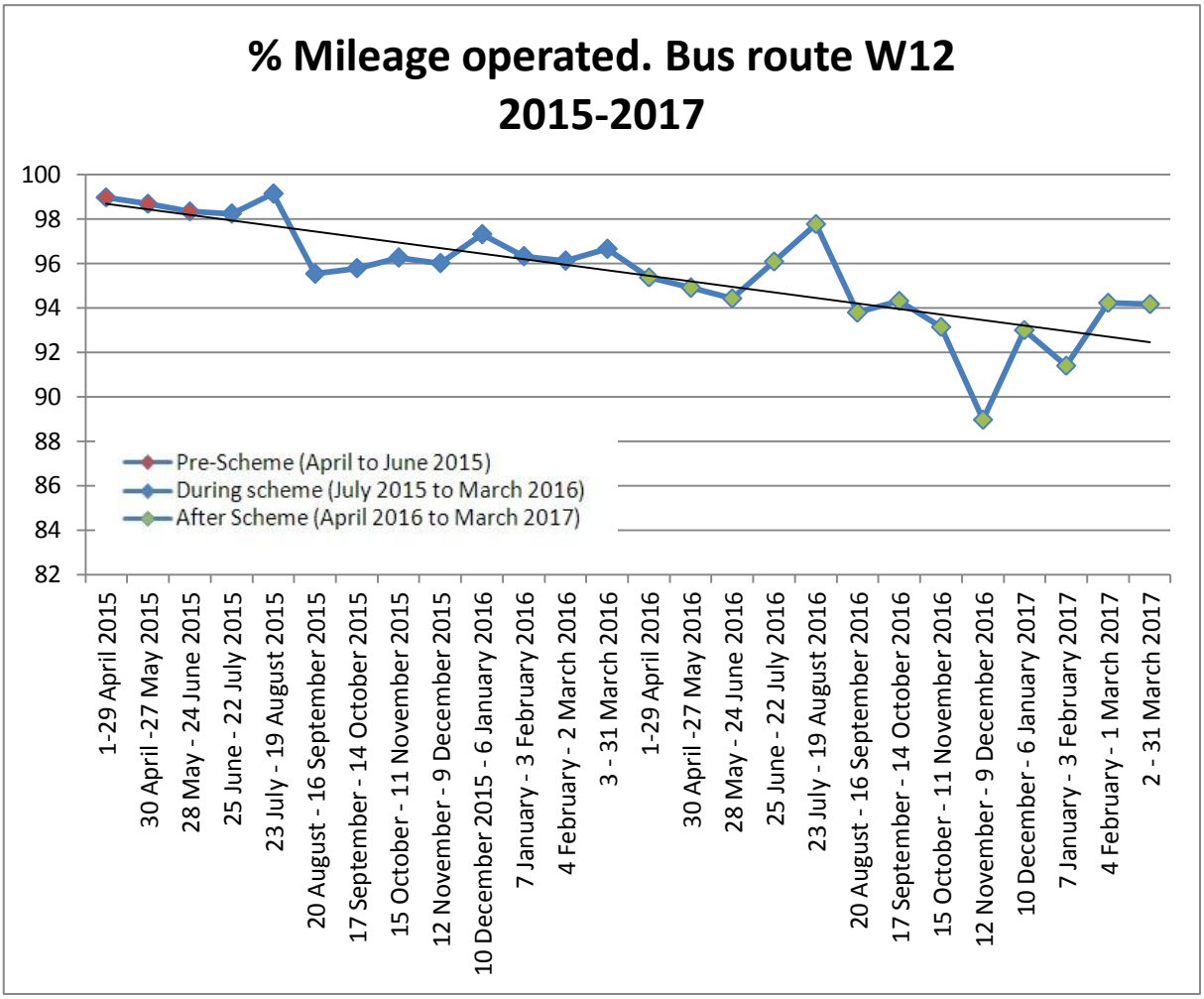


Figure 60: Percentage of mileage operated in comparison to the schedule

Figure 60 shows the percentage of mileage operated against the schedule. The W12 has seen a reduction in the percentage of mileage completed. The mileage-operated figure gives us an indication if the route is not completing its full route as scheduled some of the time. This could be for a number of reasons including traffic congestion, staff availability or vehicle breakdown. As can be seen during the period analysed, the percentage of the scheduled route being completed has reduced slightly from 99% to approximately 94%, but is still operating the full route a large proportion of the time

4.4.5 W12 overall performance

The performance of the W12 during the two year period considered has been mixed, depending on which performance measure is used. The scheduled and actual run times are generally well matched, with little change except in the afternoon peak period. This relatively small variation could be due to the Village seeing reduced vehicle speeds, especially along the bus route in Orford Road, but we expect other factors also have an influence including traffic volumes on the route. Overall however, the route is generally within one minute of scheduled journey time for most of the day The percentage of buses departing on time has consistently reduced during the two year period and we need to work with TfL to understand the reasons for this. Percentage of mileage completed has also reduced, but generally remains high at around 94%.

The next section looks closer at the bus performance outside the village area on the wider network.

4.4.6 Outside the Village - Surrounding bus routes

Within this section, we investigate each of the bus performance indicators on the wider network and on the main roads close to the Village.

4.4.7 Outside the Village - Journey time

The first set of bus journey time data that has been reviewed involves entire bus routes, or large sections of them, to provide a more general overview of journey times across the wider road network and how these may have changed between the study periods.

Five separate bus routes have been analysed (Table 10). These are of varying distances and include large sections of routes involving numerous roads, main junctions and signalised junctions across the borough. Three of these run along Lea Bridge Road, Hoe Street or both, being the two main surrounding roads to the village. However, the 58 and 158 have been chosen as popular routes away from the surrounding roads to act as a control and give an indication as to whether there are other general trends taking place and that may have an influence on the performance of the network.

2015 - 2016 Tested bus route information		
Route	Towards	Distance (Km)
20	Debden, Burton Road	4.41
20	Walthamstow Bus Stn	4.73
56	Whipps Cross Roundabout	3.96
56	St Bartholomew's Hospital (Barbican)	3.82
58	Walthamstow Bus Stn	7.14
58	East Ham (White Horse)	7.17
158	Chingford Mount	10.02
158	Stratford Bus Stn	10.31
W15	Higham Hill / Cogan Avenue (Walthamstow)	11.08
W15	Hackney Town Hall	11.28

Table 10: 2015-16 tested bus route information

To assess these routes TfL has provided journey time data for two periods:

- Before the scheme (before the closures) – 01/04/2015 to 26/06/2015
- After the scheme – 20/04/2016 to 22/07/2016

Journey time data for the five separate bus routes have been analysed, and an average of the actual run times are in Figure 61.

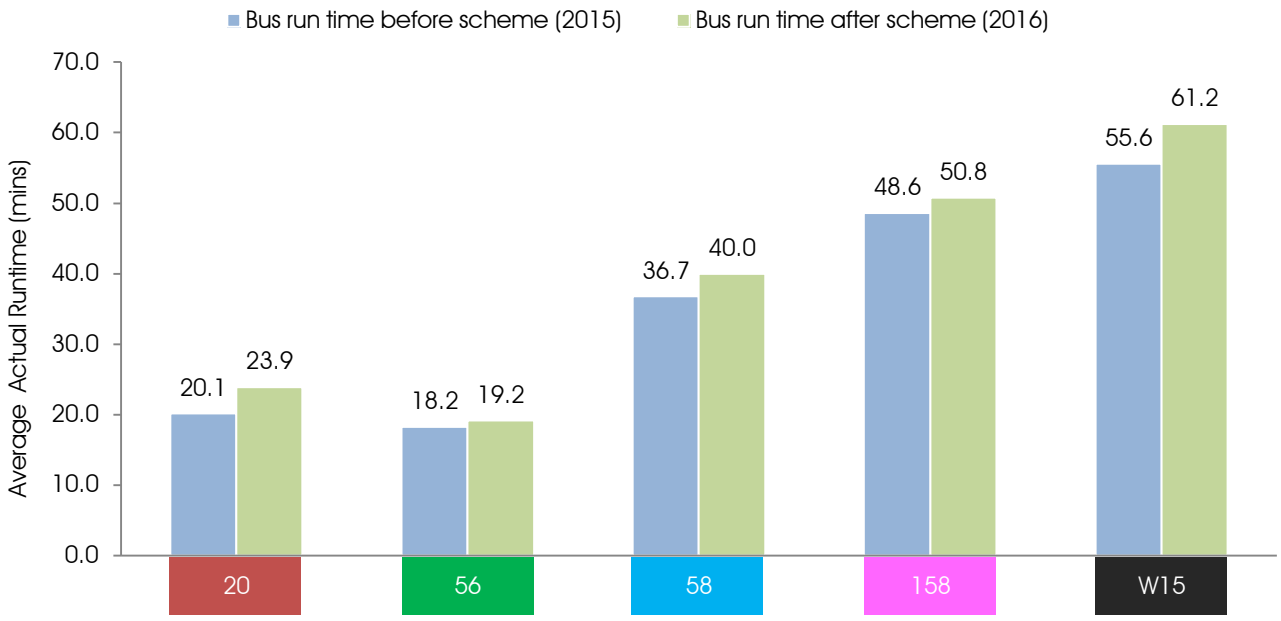


Figure 61: Comparison of average bus run times before and after scheme

The W15 has seen the biggest increase in average journey times, although consideration should be given to the length of the tested route (11km) that this data is based on. The other two routes that run on Hoe Street and Lea Bridge Road (20 and 56) have increased by short times of 2.8 minutes and one minute respectively. Both the 58 and 158 that do not use the surrounding roads also saw a slight increase in average journey times.

On average bus journey times (based on those examined) have increased slightly since 2015, with routes experiencing an average increase of 8.6% in both directions of travel. Using the above data the 56 and 158 journey times have increased by approximately 5%, the 58, 9% and the W15, 10% compared to the 20 which has increased by 19%.

This could be because of an increase in traffic on the main boundary roads around the Village, however, due to the length of the routes examined there are likely to be other factors that have influenced journey times on the bus network and it is difficult to attribute the observed changes directly, and solely, to the Walthamstow Village Scheme. For example, the 158 and 58 do not use the road surrounding the village but these have also seen an increase suggesting that wider traffic pattern changes may be taking place on the borough road network. To try to examine what impact there has been on journey times local to the Walthamstow Village area we have investigated several of the key routes around the Village further.

4.4.8 Bus routes at peak periods

We requested an additional set of bus journey data from TfL to understand more about the impact the Village scheme is having on the surroundings roads and bus network.

We identified two local bus routes, the 56 that runs on Lea Bridge Road and the 97 that runs on Lea Bridge Road.

4.4.9 Route 56 and 97 – Bus Journey times

TfL provided us with morning and evening rush hour peak data for two periods in both 2015 and 2016. This data focused on parts of the routes on the roads immediately surrounding the Village area look at the effect of the scheme more closely.

Period 1 – February to March 2015 and February to March 2016

Period 1 compared journey times between February and March 2015 (pre-scheme), and between February and March 2016 (post scheme).

- The 56 bus route was surveyed for 2.6 miles on Lea Bridge Road between Whipps Cross/Wood Street and Wattisfield Road.
- The 97 bus route was surveyed for 1.8 miles on Hoe Street between Forest Road and Bakers Arms junction.

Period 2 – April to June 2015 and April to June 2016

Period 2 compared journey times between April and June 2015 (pre-scheme), and between April and June 2016 (post scheme).

The routes provided by TfL were slightly different compared with Study 1:

- The 56 bus route was surveyed for 2.8 miles on Lea Bridge Road between Whipps Cross/Wood Street and Upper Clapton Road.
- The 97 bus route was surveyed for 1.6 miles on Hoe Street between Forest Road and Bakers Avenue.

In order to account for the variation in distance between the two studies, the observed journey times in Period 2 have been multiplied by a weighting factor to allow for a consistent comparison.

Period 1: Feb-March				Period 1 Pre-scheme	Period 1 Post scheme	Period 1 Difference
				06 Feb - 13 Mar 2015	06 Feb - 19 Mar 2016	Feb-March
Route	Direction	Tested corridor	Time Period	JT (mins)	JT (mins)	JT Difference (mins)
56	Whipps X Wattisfield Rd-Whipps X/Wood St	Lea Bridge Road (2.6 miles)	AM Peak	15.10	15.95	0.9 (54 secs)
			PM Peak	20.45	21.80	1.4 (84 secs)
	St Bartholomews Whipps X/Wood St-Wattisfield Rd		AM Peak	20.95	21.25	0.3
			PM Peak	19.05	20.00	0.9
97	Stratford Forest Rd/Bell Corner- Hoe St/Bakers Arms	Hoe Street (1.8 miles)	AM Peak	17.35	17.35	0.0
			PM Peak	19.15	19.80	0.7
	Chingford Hoe St/Bakers Arms-Forest Rd/Bell Corner		AM Peak	12.95	13.95	1.0
			PM Peak	15.15	19.00	3.9
Period 2: Apr-Jun				Period 2 Pre-scheme	Period 2 Post scheme	Period 2 Difference
				27 Apr - 14 Jun 2015	25 Apr - 12 Jun 2016	Apr-Jun
Route	Direction	Tested corridor	Time Period	Weighted* JT (mins)	Weighted* JT (mins)	JT Difference (mins)
56	Whipps X Upper Clapton Rd-Whipps X/Wood St	Lea Bridge Road (2.8 miles)	AM Peak	15.32	15.23	-0.1
			PM Peak	19.69	20.80	1.1
	St Bartholomews Whipps X/Wood St-Upper Clapton Rd		AM Peak	20.34	21.17	0.8
			PM Peak	20.34	19.78	-0.6
97	Stratford Forest Rd/Bell Corner-Bakers Avenue	Hoe Street (1.6 miles)	AM Peak	17.66	17.33	-0.3
			PM Peak	18.68	20.59	1.9
	Chingford Bakers Avenue-Forest Rd/Bell Corner		AM Peak	15.41	15.64	0.2
			PM Peak	18.11	25.09	7.0

Table 11: Comparison of bus journey times (JT) in peak traffic corridors 2015 – 2016

** Period 2 journey times have been weighted based on comparative length of tested corridors*

In period 1 (comparison between February/March 2015 and February/March 2016) there has been a slight change in journey times with the majority under a one minute increase. However, the 97 in a northerly direction has seen the most significant increase at just under four minutes in the PM peak.

In period 2 (comparison between April -June 2015 and April - June 2016) there was again slight variations in the journey time but with some journey times actually being quicker in 2016 compared to same period of 2015. However, the most notable change was a seven minute increase in the PM peak for the 97 bus route.

The afternoon peak for route 97, in the northbound direction to Chingford, saw the most significant changes in journey time. The Period 2 comparison showed an increase of seven minutes from 18.1 minutes pre-scheme (April -June 2015) to 25.1 minutes post scheme (April - June 2016). However, in Period 1 (Feb/March), the difference between 2015 and 2016 was a lot less with only a 3.9 minute increase. This suggests that while there does appear to have been some increase there may have been other factors also contributing to the 25.1 minutes post scheme time, which cannot be fully attributed to the changes in the Village.

Furthermore, when comparing the results for periods 1 and 2 from the same year prior to the start of the scheme, i.e. comparing Feb/March 2015 with April/June 2015, there is also an increase in journey times in the PM peak for the route 97 of 3 minutes. As most of the measures (including the majority of road closures) had not been introduced yet it is unlikely this increase in journey time was due to the introduction of the Village scheme. Therefore, some of the increases in journey times that appear to have taken place on the network most be due to seasonal variations and/or other factors and cannot solely contributed by the scheme. Similarly, a comparison of the pre-scheme data from Period 2 (April – June 2015) with the post scheme data from period 1 (Feb/March 2016) only shows a 1 minute difference in journey times for the 97 northbound in the PM peak. Highlighting again the impact that seasonal variations, and other factors, can have on the performance and operation of the network.

Overall, it appears that bus journey times have increased slightly, however, most of the fluctuations in journey time were less than one minute. The 56 saw no significant variation in journey time, suggesting that this part of Lea Bridge Road has not been affected. This seems to match the hourly traffic flow data for Lea Bridge Road (section 4.3) that suggests that the volume of traffic has not increased during the peak travel periods and is spread out across the day.

When comparing statistics that can be influenced by so many factors it is difficult to attribute any change in time directly to the scheme, however, by using many different types of indicators patterns can be developed. In the following section, we have

investigated two further key indicators for bus performance – Excess Wait Time and % Mileage operated.

4.4.10 Routes 56 and 97 - Excess waiting times

The second key TFL indicator for bus performance is the excess waiting times. For this, we have compared two years of data starting prior to the scheme in April 2015 to March 2017. This has been collated over four-week periods and provide 13 separate data points in each year.

We have data for route 97 that travels along Hoe Street and route 56 that travels along Lea Bridge Road. It should be noted that the data provided by TfL is for the full route and not just for the part alongside the Village scheme and therefore, as noted previously, other factors can affect the route results.

Figure 62 shows the average time (in minutes) passengers have to wait over and above what would have been expected if route 56 was running exactly as scheduled.

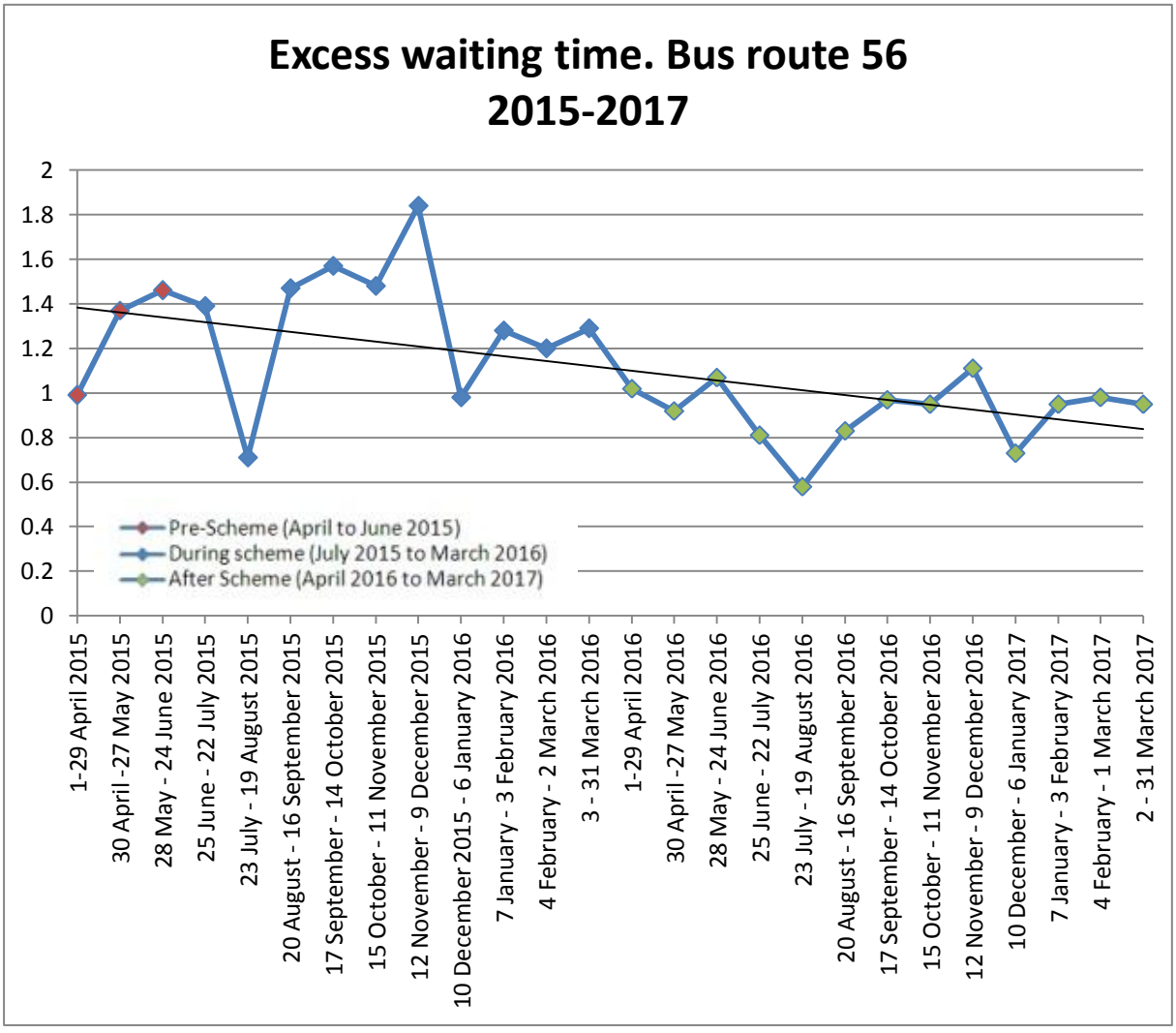


Figure 62: Excess waiting times for route 56

Figure 62 shows that the route 56 excess waiting time has actually reduced since the introduction of the scheme. During construction, there was a slight increase however over the last four periods we have data for this has reduced to below one minute and is consistently lower than the times pre-scheme.

These figures again match the traffic figures and also the bus journey time data during the peak period to show that route 56 performance has not been detrimentally affected

Figure 63 shows the average time, in minutes, passengers have to wait over and above what would have been expected if route 97 was running exactly as scheduled.

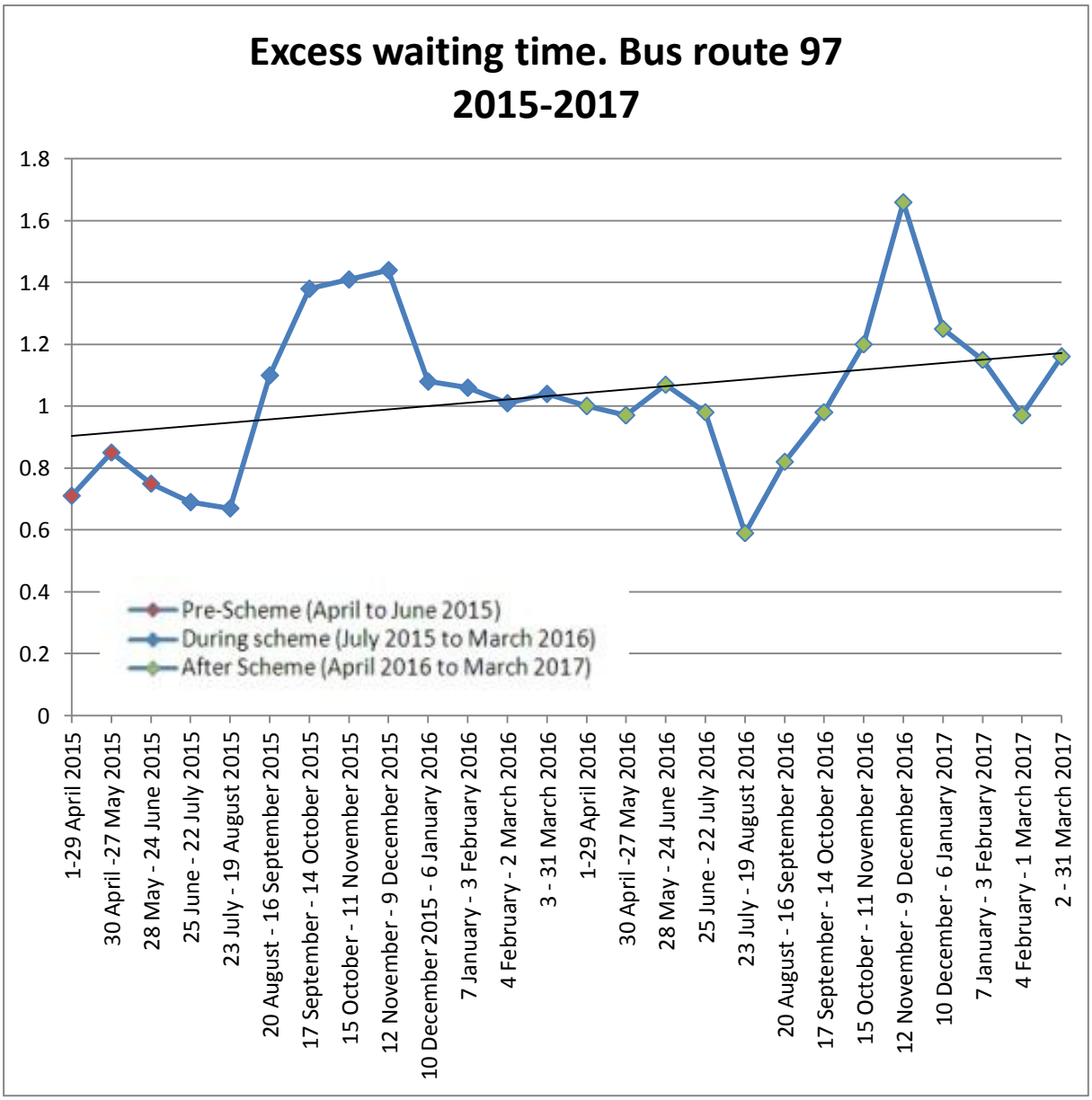


Figure 63: Excess waiting times for route 97

Figure 63 shows that route 97 has seen a slight increase in the excess waiting time post scheme. However, there is one result that is well above the rest suggesting that other factors influence this particular result. During this period (November 2016) works had started on Walthamstow gyratory and this may have caused further delays to the route. Overall, this matches what we have seen on the previous sections, Hoe Street has a slight increase on traffic flow and a small reduction in bus performance with an average 30 second increase in wait time.

4.4.11 Routes 56 and 97 - Percentage of completed miles travelled

The final bus performance indicator is an evaluation of the number of completed kilometres the buses have driven compared to the schedule. Scheduled kilometres may not be met because services are curtailed, cancelled or suspended due to traffic congestion, staff availability or engineering problems.

Figure 64 shows the recorded results for percentage of mileage completed over a two-year period starting in April 2015.

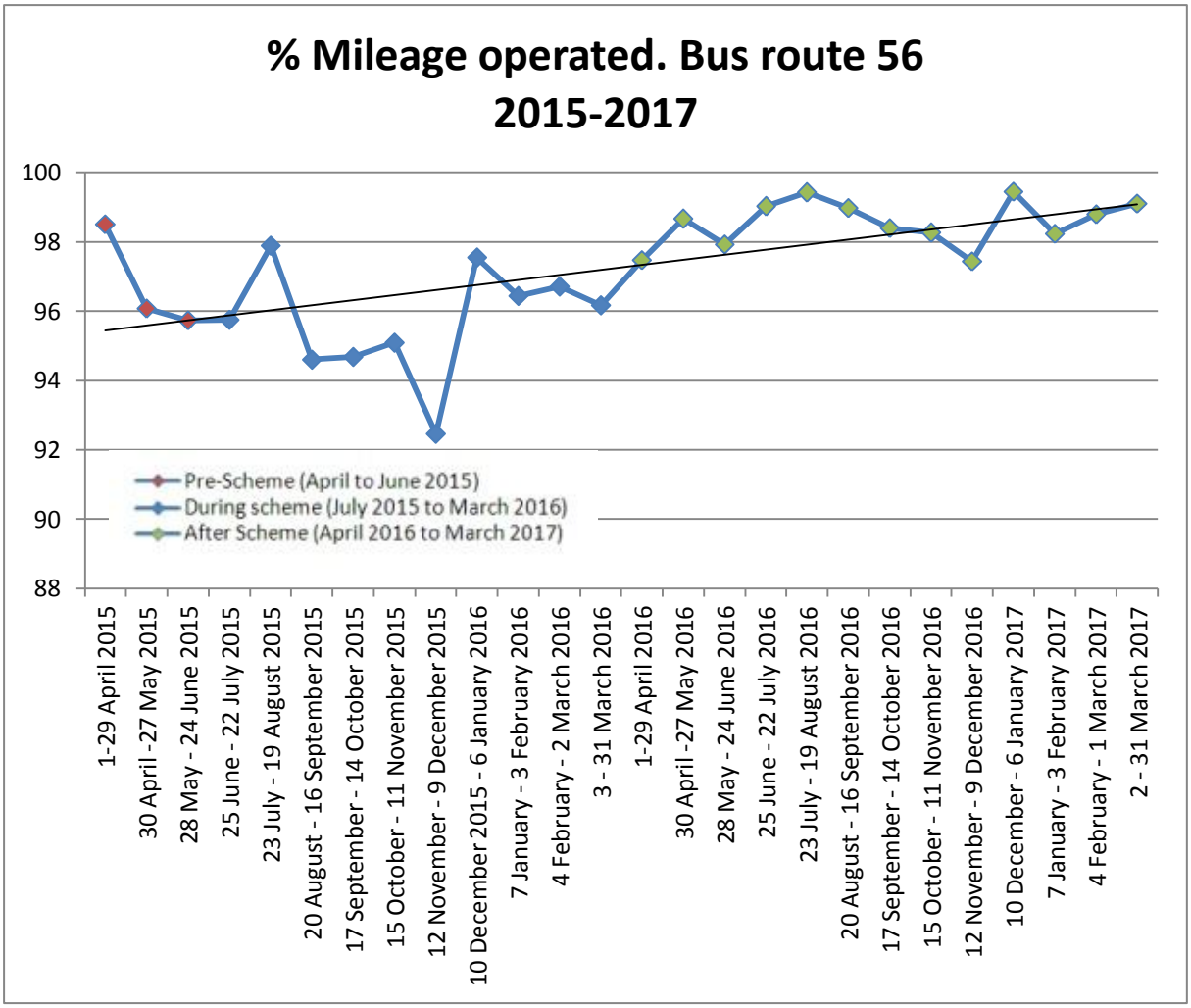


Figure 64: The percentage of mileage operated against scheduled mileage for route 56

Figure 64 demonstrates that since the introduction of the Walthamstow Village scheme the bus route 56 has become more reliable with a high percentage of mileage complete compared to the schedule.

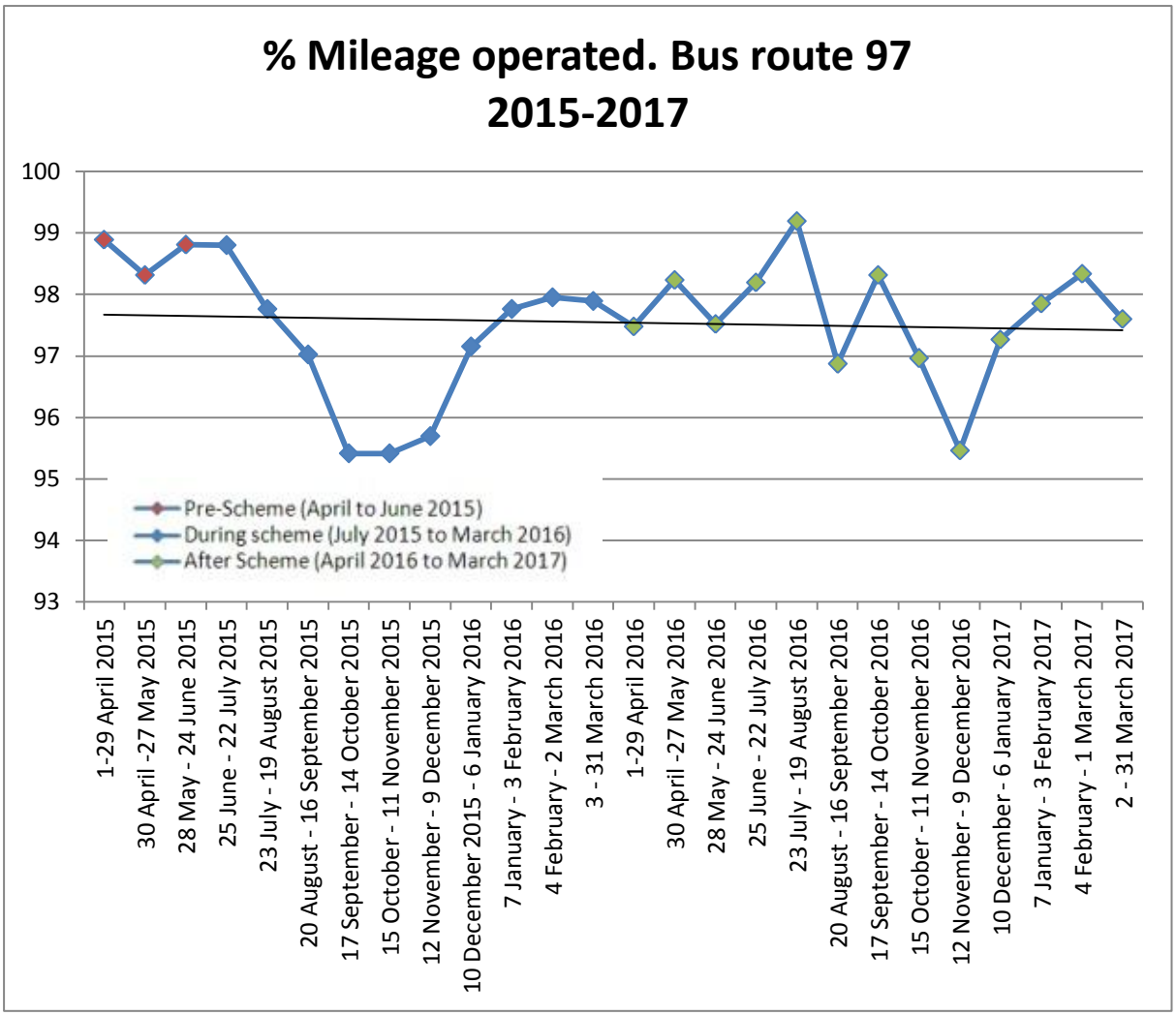


Figure 65: The percentage of mileage operated against scheduled mileage for route 97

Figure 65 shows that prior to scheme implementation the mileage completed was very close to the percentage scheduled. This has seen a dip during the construction phase and although it has improved it is slightly below its original performance pre-scheme. The lowest point in the last two years is in November 2016, which is again likely to be due to the start of the Walthamstow Gyratory works. Overall, while the percentage of mileage operated has dropped slightly following the implementation of the Village scheme the change has been relatively minor and is currently operating at around 98%, compared to 99% before.

4.4.12 Summary of bus performance

- The run time of the W12 bus route through the Village area has changed but for the majority of the day buses running very close to their scheduled times. There were some variations between scheduled and actual run times during the afternoon period of 3pm to 5pm, however the biggest average variation was three minutes behind schedule for the W12 eastbound between 3pm-4pm. Bus mileage completed remains high but the percentage of buses departing on time has consistently reduced and further work is required with TfL to review this.
- The wider TfL bus network has been analysed to enable us to understand the impact of the scheme on the main roads. Unfortunately this is not a perfect set of data as other factors can influence the results. However, it has shown that all three indicators show a slight decrease in performance on Hoe Street. This includes an additional 30 seconds waiting time delay, a 1% drop in mileage completed and an average journey time increase based on an assessment of bus route 97. On the other hand, the results of the analysis show that route 56 on Lea Bridge Road has improved in many areas, with journey times on average the same with some gaining time and other losing time, a 2% higher percentage of mileage complete and 30 second reduction in excess waiting time.
- We continue to work with TfL to monitor performance and at present most indicators are within TfL's acceptable thresholds, so it would appear that there has not been as significant change to bus operations as initially thought.

4.5 Walking and cycling

Aim 3 of the scheme focuses on making it easier for people to walk and cycle around Walthamstow Village. This forms part of the wider objective of the Enjoy Waltham Forest programme to encourage residents and visitors to the borough to choose more sustainable and active modes of transport.

Providing an environment that is safer, more accessible and more attractive for walking and cycling plays a key part in encouraging this change.

Two technical walking and cycling studies were completed as part of this review:

- A junction safety assessment based on the guidance set out in TfL's 'London Cycling Design Standards', measuring the level and likelihood of conflict, specifically for cyclists, at some of the key junctions in the area.
- The ATC studies discussed in Section 4.2 also collected data on the number of cyclists within the Village area and surrounding roads, which is analysed and discussed in this chapter.

4.5.1 Junction assessments

Methodology

The most common types of cycle collisions occur at junctions. So in order to determine the success of the scheme at improving the safety of the residential roads for cyclists, we carried out a series of assessments at some of the key junctions in the Village area. The safety assessments were carried out using junction assessment criteria outlined in the 'London Cycling Design Standards' (TfL 2016).

The criteria is based on the safety of the junction for pedal cyclists and include, but is not limited to:

- The ease of turning for cycles
- The number of traffic lanes
- The available cycle lane facilities
- The use of traffic and dedicated cycle signals
- The presence of traffic calming features
- The volume and speed of vehicle traffic
- Other protections provided by the physical layout of the junction.

A series of 11 junctions were assessed and assigned scores based on their ease of use before and after the introduction of the scheme. Each turning movement was assigned to one of three categories, based on how well the above criteria were satisfied:

- Red (scores 0 points) – where conditions exist that are most likely to give rise to the most common collision types
- Amber (scores 1 point) – where the risk of those collisions has been reduced by design layout or traffic management interventions
- Green (scores 2 points) – where the potential for collisions has been removed entirely.

Table 12 below demonstrates the elements of the criteria that is used when making the assessment on each of the movements taken by cyclists.

Red	Amber	Green
0/2 Points	1/2 Points	2/2 Points
Heavy left turn movement with high HGV mix	Entry treatment at side road junction	Left turn ban for general traffic
Opposed right turns with general traffic accelerating quickly into opportunistic gaps	Continuation of lane across junction	Opposing right turn banned for general traffic
Left slip lane	Right-turn protected island	Physically protected turn
Guard-railing	Tight corner radii; pinch points removed (avoiding nearside lane of 3.2-4.0m)	Left bypass of signals
Large junction radii	Bus lane of 3.0-3.2m or of 4.5m or more	Segregation of cycle movements using dedicated cycle signals
High speed motor traffic through junction	2m wide central feeder lane	Raised tables
Uphill gradients	ASLs (preferably 5m+ deep)	Area-wide speed limit/ reduction
Wide junction crossings	Signal adjustments to cycle movements	
No clear nearside access Multiple lanes		

Table 12: Example Criteria for junction assessments adapted from: Figure 2.4 Indicative criteria for scoring junction assessments (London Cycle Design Standards), TfL (2016)

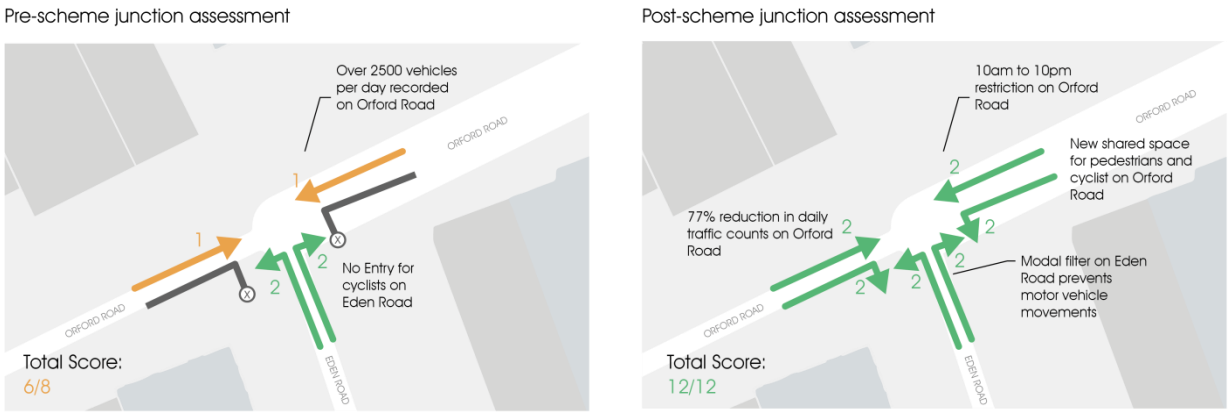


Figure 66: Example junction assessment

Figure 66 shows an example junction assessment for Orford Road and Eden Road. Prior to the introduction of the scheme, there were four available movements for cyclists, allowing a maximum score of eight points. The two-ahead movements on Orford Road scored one out of two points each (amber) as there was a large number of daily vehicles with no additional provisions for cyclists at the junction. This gave the junction a total score of six out of eight.

Following the introduction of the scheme, the no-entry restriction on Eden Road was removed for cyclists creating two additional possible movements at the junction. This allowed for a total score out of twelve, as there were now six available movements.

The large reduction in vehicle traffic, the introduction of the 10am to 10pm vehicle restriction on Orford Road, and the new raised area and improved layout for pedestrians and cyclists meant that this junction scored a maximum score of twelve after the introduction of the scheme.

Pre-scheme scores

Figure 67 shows a map of the 11 tested junctions and their assessed scores before the scheme was introduced. The junctions are rated against a maximum score (i.e. achieved if all available turning movements were deemed to be in the green category). It is clear that the junctions adjoining the main roads of Lea Bridge Road and Hoe Street are the least safe for cyclists, with junctions B, C, D and J scoring four out of an available 12 points. The junctions within the Village scored better, but both A and I on Grove Road only scored around half the available points, this was mostly due to the high volumes of vehicle traffic travelling east-west on this route.

Junction		Score
A	Shernhall Street / Grove Road	10/24
B	Hoe Street / Second Avenue	4/12
C	Hoe Street / Granville Road	4/12
D	Hoe Street / Clarendon Road	4/12
E	Eden Road / Grosvenor Rise East	8/10
F	Orford Road / Eden Road	6/8
G	Orford Road / East Avenue	16/24
H	East Avenue / St Mary Road	6/12
I	Grove Road / Eden Road	9/18
J	Fraser Road / Lea Bridge Road	4/12
K	Beulah Road / Addison Road	2/4

Figure 67: Map of Pre-scheme junction assessment scores

Post scheme scores

Figure 68 shows a map of the 11 tested junctions and their assessed scores following the introduction of the scheme. The improvements to the junctions, as well as significant decreases in traffic volume and 85th percentile speeds, have led to increased cycle safety, with all tested junctions scoring better than before.

The junctions with Hoe Street (B, C and D) saw improvements in safety, due to the introduction of additional features such as blended 'Copenhagen' crossings, slowing vehicles at the junction and reducing their priority, and reducing turning movements by making Second Avenue into exit only.

The introduction of modal filters within the Village has made the junctions at locations such as E, F, G and I much safer. They have created safer spaces for cyclists and pedestrians, by reducing overall volume of traffic and conflicting turning movements. This coupled with safer road layouts, reduced vehicle speeds and very significant reductions in traffic volume, has resulted in very high junction safety assessment scores within the Village area.

	Junction	Score
A	Shernhall Street / Grove Road	17/24
B	Hoe Street / Second Avenue	7/12
C	Hoe Street / Granville Road	6/12
D	Hoe Street / Clarendon Road	6/12
E	Eden Road / Grosvenor Rise East	24/24
F	Orford Road / Eden Road	12/12
G	Orford Road / East Avenue	24/24
H	East Avenue / St Mary Road	12/12
I	Grove Road / Eden Road	22/24
J	Fraser Road / Lea Bridge Road	7/12
K	Beulah Road / Addison Road	8/12

Figure 68: Map of Post scheme junction assessment scores

4.5.2 ATC bicycle count data

The ATC studies discussed in Section 4.2 also collected data on the number of cyclists within the Village area. This has been used to determine the number of cyclists using the road network and whether certain routes have seen an increase in usage following the improvements.

A summary of the counts recorded on each road is in Table 13.

2014-2016 Daily bicycle counts				
Road Name	2014 Daily bicycle count	2016 Daily bicycle count	Change Daily bicycle count	% Change daily bicycle count
Addison Road	72	95	23	31.9
Beulah Road	70	52	-18	-25.7
Church Lane	31	116	85	274.2
Copeland Road	50	60	10	20
Eden Road	32	43	11	34.4
Shernhall Street (West of Barclay Road)	143	89	-54	-37.8
Grovsenor Park Road	51	42	-9	-17.6
Orford Road	114	255*	141	123.7
Pembroke Road	79	94	15	19
St Mary Road	195	159	-36	-18.5

Table 13: 2014 - 2016 Daily bicycle counts

**Orford Road data collected from permanent counter*

As shown by the data in Table 13, and reflected in Figures 69 and 70, there was a net increase in the total number of cyclists recorded between the 2014 and 2016 studies.

Figure 69: Daily cycle counts (2014 Study)

Figure 70: Daily cycle counts (2016 study)

Figure 71: Percentage change in daily bicycle counts (2014 to 2016)

4.5.3 Change in cycle counts

Figure 71 shows the percentage change in cycle counts observed on each of the tested roads. It is clear that some roads have seen reductions while others have seen increases. Orford Road, Church Lane and the north-south route on Copeland Road and Pembroke Road saw some of the most significant increases. This suggests that the modal filters (road closures) preventing the north-south rat-run have made this route more attractive to cyclists and that more now visit the Orford Road area. Beulah Road, St Mary Road and the section of Shernhall Street west of Barclay Road all saw decreases.

The changes observed in the vehicle count study (discussed in section 4.2) seemed to be distributed across the area and it was easier to identify commonly used routes. Whereas the cycle counts were more random in fluctuation, with some roads seeing increases and others seeing decreases. It is also likely that cyclists undertake shorter journeys or leisure trips within the Village, which are likely to be more random in nature, as well as using smaller back street routes.

4.5.4. Summary of walking and cycling

- Junction assessment using LCDS methodology found that all tested junctions in the area scored better than pre-scheme. This was attributed to improvements to cycle safety at junctions, as well as decreases in traffic volume and 85th percentile speeds.
- The introduction of modal filters (road closures) within the Village has created safer spaces for cyclists and pedestrians, as well as reducing conflicting turning movements. This has resulted in very high junction safety assessment scores within the Village area.
- There was a net increase in the total number of cyclists recorded in the Village area between the 2014 and 2016 ATC studies.
- The number of cyclists counted on Orford Road increased by 124% between the two studies, suggesting the central area has become a more attractive place for people to visit by bike.
- The change in cycle counts between the two studies varied. It was harder to identify commonly used routes compared with the vehicle count study. There were increases on some roads and decreases on others. This could be attributed to the more random nature of shorter trips or leisure journeys within the Village.

4.6 Road safety

4.6.1 Collision data

Aim 2 of the scheme is to improve the safety of the residential streets for all road users. A quantifiable measure of improved safety is to compare TfL's collision data from before and after the implementation of the scheme.

TfL logs all personal injury road traffic collisions that occur on the public highway in Greater London, and that are reported to the police.

With a scheme of this scale it is standard practice to compare three years of collision data from before and after the project's completion. This is necessary to assess long-term safety and iron out any short-term fluctuations in data. However, due to the timing of this review, only 11 months of post scheme data is available at the time of writing.

The collision data three years prior to the scheme's implementation was recorded between the dates of: **01/09/2012** to **31/08/2015**

The collision data for 11 months after the scheme's implementation was recorded between the dates of: **01/09/2015** to **21/07/2016**

4.6.2 Collisions within the Village area

Table 14 shows a summary of all recorded collisions within the Village (not including Hoe Street, Lea Bridge Road or Shernhall Street, which are reviewed later in this section) during the three years prior to the scheme's implementation and 11 months after. In total there were 15 slight collisions recorded over the three years with an average of five per annum. There were no collisions recorded within the Village area within 11 months of its implementation.

	Total recorded collisions in the Village 2012-2016						
	Pre-scheme (three-year period)				Pre-scheme totals		Post scheme (11 month period)
SEVERITY	Sept – Dec 2012	2013	2014	Jan - Aug 2015	Total	Average (per annum)	Sept 2015 - July 2016
Fatal	0	0	0	0	0	0	0
Serious	0	0	0	0	0	0	0
Slight	2	5	4	4	15	5	0
Damage	0	0	0	0	0	0	0
TOTAL	2	5	4	4	15	5	0

Table 14: Summary of TfL recorded collision data 2012-2016 by severity

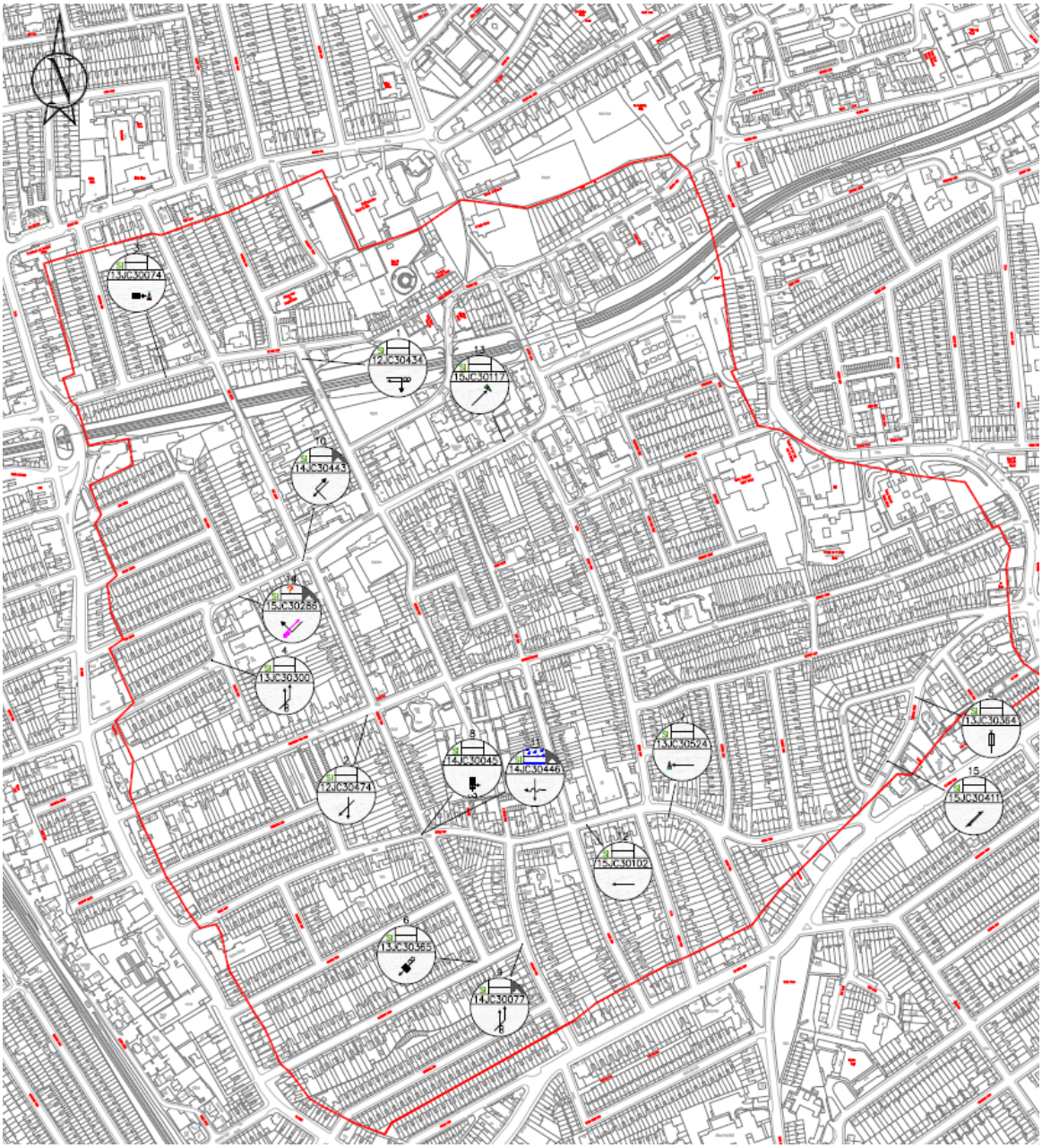


Figure 72: Pre-scheme collision locations (provided by Tfl)

As shown in Figure72, six of the 15 collisions were located on the east-west route along Grove Road. There are also some concentrated around the north-south route of Pembroke Road and Copeland Road. These are two of the key through routes that the scheme focused on changing.

In the 11 month period following the implementation of the scheme there were no recorded collisions within the Village area. This is an encouraging sign and implies that road safety within the Village area has improved because of the changes, although a further assessment with three full years post scheme data will need to be undertaken to categorically conclude that there has been a long-term safety improvement within the area.

4.6.3 Collision data on surrounding roads

Even though there has been an increase in road safety within the Village, it is important to assess how safely the surrounding roads are operating.

As part of this review, we compared data showing the total number of collisions recorded on three of the main surrounding roads in the three years prior to the scheme and 11 months after its implementation.

The pre-scheme collisions were recorded between **01/09/2012** and **31/08/2015.**

The post scheme collisions were recorded between **01/09/2015** and **29/07/2016.**		Total Recorded Boundary Road Collisions 2012-2016					
		Pre-scheme (three-year period)				Post scheme (11 month period)	
Road Name	Severity	Sept - Dec 2012	Jan - Dec 2013	Jan - Dec 2014	Jan - Aug 2015	Sept - Dec 2015	Jan - Jul 2016
Hoe Street	Serious	0	3	1	0	0	1
	Slight	9	15	18	17	4	16
Shernhall Street	Serious	0	0	0	0	0	0
	Slight	0	2	5	2	4	1
Lea Bridge Road	Serious	0	1	2	0	0	0
	Slight	8	13	23	19	3	17

Table 15: Total recorded collisions on boundary roads 2012 – 2016

Table 15 shows the total number of recorded collisions on the three boundary roads in the three years before the scheme, as well as the eleven months after. In most cases, the number of slight collisions recorded on each road in 2016 was similar to previous years.

Hoe Street saw 16 slight collisions in 2016 (between January and July) compared to 17 recorded in the similar period of 2015. There were four serious injuries in Hoe Street in the 3 years before the scheme and one recorded since.

Shernhall Street has seen no serious injury collision since 2012, and saw no change in this since the introduction of the scheme. The slight injury collisions have increased when compared to 2013 and 2015 but stay the same as the level of collisions in 2014 With the low number of collision both before and after the scheme we would need to take into a consideration a full three year period before and after to understand any long term trends.

On Lea Bridge Road there has been 17 slight collisions in 2016 compared with 19 recorded in a similar period of 2015.

As expected with this type of data, the numbers vary from year to year, for example there were 13 slight collisions recorded on Lea Bridge Road in 2013 but 23 in 2014. As we only have data for 11 months after the scheme was implemented it is difficult to identify any definitive trends in terms of long-term safety performance, however, the initial data suggests that the annual number of collisions has roughly stayed the same.

In order to have an understand collisions involving vulnerable users (pedestrians and cycles) in the area we have broken this down to see the number of walking and cycling collision on the boundary roads.

The post scheme collisions were recorded between **01/09/2015** and **29/07/2016.**		Total Recorded Boundary Road Collisions 2012-2016					
		Pre-scheme (three-year period)				Post scheme (11 month period)	
Road Name	Mode	Sept - Dec 2012	Jan - Dec 2013	Jan - Dec 2014	Jan - Aug 2015	Sept - Dec 2015	Jan - Jul 2016
Hoe Street	Pedestrian	2	4	6	2	1	9
	Cyclists	3	4	5	4	0	4
Shernhall Street	Pedestrian	0	1	2	1	1	1
	Cyclists	0	0	1	0	1	0
Lea Bridge Road	Pedestrian	2	4	2	3	1	1
	Cyclists	0	6	8	7	0	7

Table 16: total recorded pedestrian and cyclist collisions on boundary roads 2012-2016

Table 16 shows that pedestrian and cyclist collision levels on the boundary roads have generally remained consistent across all years both before and after the introduction of the scheme, the exception being Hoe Street which appears to have seen an increase in pedestrian collisions in the post-scheme period. To understand these changes further we have mapped the location of each collision as shown in Figure 73.

Figure 73 shows the location of walking and cycling collisions since the introduction of the scheme. There has been a high concentration of accidents involving cyclists on the east side of Lea Bridge Road near the junctions with Eastern Road, West End Avenue and Peterborough Road. These junctions were not improved as part of the scheme, however additional safety measures for cyclists and pedestrians will be included here as part of ongoing improvements to Lea Bridge Road.

On Hoe Street, the post scheme pedestrian collisions are spread along the road with three to the north of any scheme measures and two at the junction of Hoe Street and Lea Bridge Road. Clearly the apparent increase in pedestrian collisions is a concern but as shown by the various collision data above there can be significant year on year fluctuations which is why three year's worth of data is normally considered to account for shorter term annual variations.

Blended 'Copenhagen' crossings have been implemented along both of these roads and the next section specifically looks at their safety performance in more detail.

Figure 73: Cycling and walking collision post scheme

4.6.4 Pedestrian and cycle safety at Copenhagen crossings

To help make walking and cycling in the Village area easy, safe and enjoyable, a new style of blended 'Copenhagen' crossing was introduced at twelve side road junctions across Hoe Street and Lea Bridge Road as can be seen in Figure 73.

Blended 'Copenhagen' crossings are designed to slow down vehicles when entering or exiting side roads and encourage vehicles to give way to pedestrians crossing the road, reinforcing the rules of the Highway Code 170.

Figure 74 also shows the locations of all collisions recorded at the same junctions which involved pedestrians or cyclists, both before and after the blended crossing improvements.

Collisions involving pedestrians are indicated by the blue markers and cyclists by the green markers. The numbered flags represent areas where multiple collisions were recorded at approximately the same location.

In the 11 months after the introduction of the scheme there have been only two recorded slight collisions on the boundary roads involving pedestrians or cyclists at locations where new blended 'Copenhagen' crossings have been introduced, compared to 18 collisions over three years pre-scheme at junctions where 'Copenhagen' crossings have been introduced. Both collisions post-scheme were at the junction of Hoe Street with Grove Road.

The first collision involved a vehicle turning right from Hoe Street into Grove Road and hit a cyclists travelling southbound on Hoe Street. The second involved a pedestrian crossing Hoe Street and a vehicle travelling southbound. The police recorded both collisions as likely causation factors of a failure to look properly. This would suggest that the design element of the junction was not a consideration to the collisions.

From a review of the collision record since their introduction blended crossings appear to perform well from a statistical collision perspective but we do acknowledge the concerns of residents and users as described to us in the key stakeholder meetings detailed in section 3.4

In addition to monitoring actual collisions/safety at our blended crossings we are currently undertaking a separate piece of work with TfL to monitor user behaviour and interaction at several blended crossings in the borough. This has involved taking video surveys before and after the changes to compare user behaviour and the interaction between drivers, pedestrians and cyclists. This work is currently ongoing and so is unfortunately not available for inclusion in this review

Pre-scheme pedestrian and cyclist accidents at 'Copenhagen' junctions

Post-scheme pedestrian and cyclists accidents at 'Copenhagen' junctions

Figure 74: Comparison of pre-scheme and post scheme pedestrian and cyclist accidents at 'Copenhagen' junctions

4.6.5 Road safety audit

Royal HaskoningDHV carried out an independent stage 3 road safety audit in November 2016. Their report includes observations on how the scheme is performing. It also includes recommendations on how to correct minor safety issues that may not have been in previous stages of the design, or have only become apparent through the practical implementation of the scheme.

A summary of the issues raised in the road safety audit at one or more locations within the area of works is shown in Table 17. The locations of these issues have been mapped in Figure 75.

Description of safety issue	Recommendation
Drainage	
Ponding of surface water could lead to the potential for vehicle / cycle loss of control or collisions as a result of a slip or skid, particularly during periods where the road surface is wet / icy.	Re-grade channel to ensure surface water can reach existing gullies or provide additional drainage measures at the crossing, ensuring the design is suitable to ensure cycle wheels do not become trapped within the slats.
Public Utilities / Service Apparatus	
Uneven manhole cover may cause cyclists to lose control, resulting in collision or personalinjury as a result of a fall.	Repair / replace the manhole cover, meeting the required properties of BS EN 124-1: 20151, and repair carriageway surface, reducing potential for loss of control.
Landscaping	
Uneven surfacing could lead to pedestrian trips / falls, resulting in conflict with other users or personal injury as a result of a fall.	Provide covering such as permeable resin or tree pit grill ensuring that a flush footway surface is maintained.
Reflective Features	
Insufficient driver awareness of bollards could lead to sudden braking, rear end shunts or collision with street furniture.	Provide adequate reflective panels / strips on all removable bollards to improve conspicuity.
Insufficient driver awareness of planters could lead to sudden braking, rear end shunts or collision with street furniture.	Provide adequate reflective panels / strips on all planters forming part of the modal filters to improve conspicuity.

Non-Motorised User (NMU) Provision	
Tactile paving guides visually impaired pedestrians into street furniture with the potential for personal injury.	Relocate street furniture to prevent obstruction to pedestrians or, if this is not possible, relocate pedestrian crossing.
Cycle Safety	
Cycle parking within the carriageway or at the extents of car parking bays, is exposed to vehicle movements which may cause damage to vehicles / cycles or surfacing, resulting in personal injury arising from pedestrian trips / falls.	Relocate cycle parking on Clarendon Road and Grove Road ensuring that sufficient clearance is provided to bicycles occupying the stands, preventing vehicle strikes. Measures to protect cycle parking where located at the extents of parking bays, such as on Grove Road / Pembroke Road, should be provided. These measures could include a bollard or planter.
Failure to provide safe transition between off-carriageway cycle path and Hoe Street could result in conflict between cyclists and vehicular traffic, resulting in collision or personal injury.	Review the current arrangement and assess the potential to widen Hoe Street, providing sufficient width to accommodate two-way traffic movement without encroachment into the area of transition.
Road Signs	
Drivers may fail to observe speed restrictions due to the alignment and location of existing signage, which could result in speeding and risk of higher severity of injury should a collision occur.	Rotate and relocate all signage so that it is correctly aligned, ensuring that signage is visible to road users
Lighting	
Insufficient warning of 'No Entry' into side roads. This could result in sudden braking, inappropriate turning manoeuvres, or drivers reversing onto main roads in conflict with other road users, including cyclists.	Ensure all 'No Entry' road signs are suitably illuminated in line with Traffic Signs Regulations and General Directions, 2016.
Failure to provide sufficient levels of illumination could lead to conflict with road users, resulting in collision.	Ensure all street lighting in the schemes is functional and provides sufficient illumination of carriageway and footway areas.

Table 17: Summary of road safety audit and recommendations

Figure 75: Map of Road Safety Audit issues by category

The safety audit suggests some minor changes to consider in order to improve the final scheme design. This includes addressing:

- minor drainage issues
- aligning a non-flush utility cover
- adding reflective material to bollards and planters at modal filters (road closures)

- improving some crossings with appropriate tactile paving
- re-locating cycle parking at a safer distance from vehicle spaces
- relocating some road signs to improve visibility and fixing broken lighting.

4.7 Summary of road safety

Collision data within the Village:

- Within the Village there were 15 slight collisions recorded over the three years leading up to the scheme with an average of five per annum. There were no collisions recorded within the Village area in the 11 months following its implementation.
- Prior to the scheme, the majority of collisions recorded within the Village were focused around two of the main east-west and north-south rat-running routes, which have since seen no collisions since the scheme was introduced.

Collision data on surrounding roads:

- The overall number of collisions on the boundary roads has stayed consistent pre and post scheme
- The yearly average of serious collisions was lower after the introduction of the scheme.
- Pedestrian and cyclist collision levels on the boundary roads have remained consistent across all years both before and after the introduction of the scheme, with the exception fo Hoe Street which has seen an apparent increase, although this is only based on 11 months data.
- There have been only two recorded slight accidents on the boundary roads involving pedestrians or cyclists at locations where new blended 'Copenhagen' crossings have been introduced, compared to 18 pre-scheme over three years at junctions where 'Copenhagen' crossings have been introduced. Both collisions post-scheme were at the junction of Hoe Street with Grove Road.

Road safety audit:

- The safety audit made recommendations for addressing some minor safety issues including:
    - fixing some minor drainage issues
    - aligning a non-flush utility cover

- adding reflective material to bollards and planters at modal filters (road closures)
- improving some crossings with appropriate tactile paving
- relocating cycle parking at a safer distance from vehicle spaces
- relocating some road signs to improve visibility
- fixing broken lighting.

5. SUMMARY OF TECHNICAL DATA RESULTS

As part of the technical data analysis, we look at four key elements, traffic flows, bus performance, walking and cycling improvements and road safety. The following provides a summary of each element.

5.1.1 Summary of vehicle flow within the Village

- Fourteen residential roads within the village were monitored before and after the introduction of the scheme. The key findings of the traffic surveys show that the number of vehicle movements has significantly decreased on the majority of roads. This includes over 90% reductions in Copeland Road, Eden Road and West Avenue.
- The average road within the Village saw a 44.1% reduction in daily traffic counts.
- Three of the 14 residential roads saw an increase including Church Lane and East Avenue. In Church Lane the post scheme vehicle counts rose by 18.9% (equivalent to 410 additional vehicles per day). In East Avenue, between its junctions with Church Lane and Orford Road, there has been an increase in traffic of 40.1% (equivalent to 833 additional vehicles per day.
- Church Lane and Vestry Road via the southern section of East Avenue and Third Avenue is the only remaining route that enables vehicles to travel from east to west across the Village. This is likely to explain why these roads have attracted some additional vehicle movements. East Avenue has seen the largest increase which we believe is due to the above as well as additional traffic accessing the short stay parking bays to visit the shops, East Avenue Mosque or as a turnaround point to avoid the Orford Road restrictions.
- However since the introduction of the scheme and right turn ban from Shernhall Street into Church Lane vehicle numbers have reduced by approximately 25% during the AM peak between 7am and 10am.
- Average vehicle speeds have decreased throughout the area, both in the mean speeds and 85%ile speed. The average 85%ile speed reduced from 21.6mph to 19.5mph.

5.1.2 Summary of traffic data on surrounding roads

- The surrounding roads of Hoe Street, Lea Bridge Road and Shernhall Street have seen a rise in traffic levels between 2014 to 2016. Hoe Street saw an increase of 401 vehicles, and the biggest increase was in Shernhall Street of 2,045 vehicles a day.

- On Shernhall Street, despite the overall increase in vehicle numbers an hourly breakdown of the data shows the two large peaks in traffic movements observed pre- scheme have reduced from 902 vehicles per hour to 663 vehicle per hour. The overall increase in vehicle numbers has come from those using Shernhall Street in the evening.
- On Lea Bridge Road, the post scheme study shows a more even distribution of traffic with fewer fluctuations in traffic volume throughout the day. The highest observed hourly peak was 940 vehicles between 1pm to 2pm in the post scheme study. Prior to the scheme (2014), the hourly peak was between 5pm to 6pm with 1,036 vehicles. In general, the maximum hourly traffic volume has reduced since the introduction of the scheme, but traffic appears more spread out across the day and into the evening.
- On Hoe Street, the post scheme vehicle counts follow a similar pattern to those observed pre-scheme. However, hourly vehicle counts on Hoe Street were lower during the 2016 study for the majority of the day from 6am to 7pm, but increased slightly during the evening. The maximum number of hourly vehicles was 924 in 2016 at 7pm to 8pm compared to a pre-scheme peak of 940 in 2014 at 9am to 10am.
- Both 85th percentile and mean vehicle speeds on the surrounding roads have reduced.
- Prior to the scheme, Shernhall Street was operating with an 85th percentile speed above its 20mph speed limit at 25.5mph, this has now reduced to 23.9mph.

Summary of bus performance

- Due to the number of bus routes running on the surrounding roads any changes in bus performance before and after the implementation of the scheme will give us an indication of the overall performance of the wider road network. TfL has a number of key bus journey performance indicators, which are: Journey times, Excess waiting times and mileage completed.
- The run time of the W12 bus route through the Village has changed slightly but with the majority of buses running very close to their scheduled times. There were some variations between scheduled and actual run times during the afternoon period of 3pm to 5pm, but the biggest average variation was three minutes behind schedule.
- On low frequency routes, such as the W12, TfL uses the percentage of buses departing on time rather than excess time a passenger waits for a bus as a key indicator. The percentage of W12's departing on time has dipped slightly since

the introduction of the scheme. In addition the mileage completed has reduced from 99% to 94%. Further work is required with TfL to review this route.

- On the wider network, average bus journey times (based on those examined) have increased slightly since 2015, with routes experiencing an average increase of 8.6% in both directions of travel. This could be because of an increase in traffic on the main boundary roads around the Village. However, due to the length of the routes examined there are likely to be other factors that have influenced journey times on the bus network and it is difficult to attribute the observed changes directly, and solely, to the Walthamstow Village Scheme. Several routes that do not use the village boundary roads were examined for control purposes (158 and 58) and these saw similar increased between the study periods indicating wider trends across the borough taking place as well.
- In order to reduce the impact of factors external to the immediate Walthamstow Village area, shorter sections of certain routes were analysed during peak times against the three key performance indicators. The two routes analysed were the 56 and 97.
- It appears that bus journey times on the 56 and 97 have increased slightly in certain directions during the morning and afternoon peak periods, however, most of the fluctuations in journey time were less than one minute. The 56 saw no significant variation in journey time, suggesting that this part of Lea Bridge Road has not been affected.
- The afternoon peak for route 97, in the northbound direction to Chingford, was observed to have the most significant increase in journey time. One period of comparison showed an increase of seven minutes from 18.1 minutes pre-scheme (April - June 2015) to 25.1 minutes post scheme (April – June 2016). However, another period (Feb/March 2015 compared to February/march 2016) showed smaller increases of 3.9 minutes. This suggests some additional congestion during the peak period on Hoe Street, however, when comparing different journey time data sets from 2015 (before the start of the scheme) there was a already a 3 minute increase between Feb/march and May/June, suggesting some level of seasonal variation, and/or other factors affecting the network, and therefore bus journey time changes cannot be solely contributed to the impacts of the scheme.
- Excess waiting time on route 56 has actually reduced since the introduction of the scheme. During construction, there was a slight increase however over the last four periods we have data for this has reduced to below one minute, and is consistently lower than the times pre-scheme.

- Route 97 has seen a slight increase in the excess waiting time post scheme. However, there is one result that is well above the rest suggesting that other factors have influenced the results. During this period (November 2016) works had started on Walthamstow gyratory and therefore this may have caused further delays to the route.
- Bus route 56 has become more reliable with a high percentage of mileage complete compared to the schedule. Bus Route 97 very close to the percentage scheduled, the change has been relatively minor and is currently operating at around 98%, compared to 99% before.

Summary of walking and cycling

- Junction assessment using LCDS methodology found that all tested junctions in the area scored better than before the scheme. This was attributed to improvements to cycle safety at junctions, as well as significant decreases in traffic volume and 85th percentile speeds.
- The introduction of modal filters (road closures) within the Village has created safer space for cyclists and pedestrians, as well as reducing conflicting turning movements. This has resulted in very high junction safety assessment scores within the Village area.
- The introduction of modal filters (road closures) on the north-south rat-run route appear to have increased the attractiveness of Copeland Road and Pembroke Road for cyclists, with both roads seeing increases in counts in the region of 20%.
- The number of cyclists counted on Orford Road increased by 124% between the two studies, suggesting the central area has become a more attractive place for cycling.
- The change in cycle counts between the two studies varied. It was harder to identify commonly used routes compared with the vehicle count study. There were increases on some roads and decreases on others. This could be attributed to the more random nature of shorter trips or leisure journeys within the Village.

5.1.3 Summary of road safety

Collision data within the Village:

- Within the Village there were 15 slight collisions recorded over the three years pre-scheme with an average of five per annum. There were no collisions recorded within the Village area in the 11 months following its implementation.

- Before the scheme, the majority of collisions recorded within the Village were focused around two of the main east-west and north-south rat-run routes, which have since seen no collisions.

Collision data on surrounding roads:

- The overall number of collisions on the boundary roads has stayed consistent pre and post scheme
- The yearly average of serious collisions was lower after the introduction of the scheme.
- Pedestrian and cyclist collision levels on the boundary roads have remained consistent across all years both before and after the introduction of the scheme, with the exception fo Hoe Street which has seen an apparent increase, although this is only based on 11 months data.
- There have been only two recorded slight collisions on the boundary roads involving pedestrians or cyclists at locations where new blended 'Copenhagen' crossings have been introduced, compared to 18 pre-scheme over three years at junctions where 'Copenhagen' crossings have been introduced. Both collisions post-scheme were at the junction of Hoe Street with Grove Road.

Road Safety Audit:

- The safety audit made recommendations for addressing some minor safety issues including:
    - fixing some minor drainage issues
    - aligning a non-flush utility cover
    - adding reflective material to bollards and planters at modal filters
    - improving some crossings with appropriate tactile paving
    - relocating cycle parking at a safer distance from vehicle spaces
    - relocating some road signs to improve visibility
    - fixing broken lighting.

6. CONCLUSION

6.1 Evaluation of key trends

As set out in the introduction, this review is to examine and assess the scheme against its original aims by gathering information from the community, including residents, visitors, businesses and key stakeholders, plus quantitative data from surveys and technical assessments.

The Walthamstow Village scheme has four specific aims, which all contribute to the wider objectives of the project outlined in the first chapter of this report. These are:

- Aim 1 – Reduce rat-running traffic, noise and pollution outside people's homes within the Walthamstow Village area
- Aim 2 – Improve road safety on the roads within the Village area
- Aim 3 – Make it easier for people to walk and cycle around Walthamstow Village
- Aim 4 – Make the Village area more attractive for residents and visitors

The process of the review was to gather robust information from a variety of sources to make an informed assessment of the scheme. The extensive process is explained in section 2.3, along with any limitations of the data in 2.4. We are satisfied that the methodology taken, including the use of an independent external marketing company to collect the community feedback, and the level of response can be taken as a fair representation of the impact of the scheme.

This chapter will assess the relative success of the changes to the area in meeting the aims.

6.1.1 Aim1 - Reduce rat-running traffic, noise and pollution outside people's homes

One of the primary intentions of the scheme was to reduce the number of non-residential vehicles using the Village area to cut between the surrounding main roads. By reducing the number of motor vehicles on residential streets there will be a reduction in noise and pollution outside people's homes.

Summary of impact:

- On average, residents felt that the volume of traffic on their street had roughly remained the same with 33.6% of those asked saying vehicle numbers had increased and 34.5% saying vehicle numbers had decreased in their road since the introduction of the scheme.
- However, residents perceived that traffic speed and noise had decreased, with 75% saying the traffic speeds had stayed the same or decreased in the street and 74% said noise levels had decreased or stayed the same on their street.

- 45% of residents' overall perception of their street has stayed the same. Of the remaining 55% there was a 50/50 spilt in respondents suggesting the perception of their street had increased, and those saying it had decreased. From all of the reasons that influenced residents perception of their street, 66% related to traffic and parking. It would therefore appear that the level of traffic on a resident's street is the main influencing factor in determining their overall perception of their street.
- Eleven out of the 14 roads within the Village area saw significant reductions in the number of recorded vehicles before and after the introduction of the scheme. This includes roads that were known to be rat-run links.
- Church Lane experienced increases in daily traffic volume overall, but further analysis showed a significant reduction in morning peak traffic and a more even distribution of traffic levels throughout the day.
- The traffic distribution in 2016 appears to show that there is still an east-west route via Church Lane, Vestry Road, East Avenue and Third Avenue, which vehicles are using to travel between Shernhall Street and Hoe Street.
- There was an increase in traffic volume on the surrounding boundary roads. This was 4% on Hoe Street, 11% on Lea Bridge Road and a bigger increase of 28% on Shernhall Street.
- On Shernhall Street, despite the overall increase in vehicle numbers an hourly breakdown of the data shows the two large peaks in traffic movements observed pre- scheme have reduced from 902 vehicles per hour to 663 vehicle per hour.
- The run time of the W12 bus route through the Village area has changed slightly but the majority of buses are running very close to their scheduled times.
- It appears that bus journey times have increased slightly on the routes analysed. However, most of the fluctuations in journey time were less than one minute. The 56 saw no significant variation in journey time, suggesting that this part of Lea Bridge Road has not been affected. The afternoon peak for route 97, in the northbound direction to Chingford was the only route which observed a significant increase in journey time.

Conclusion

Feedback from local residents has been that speed and noise have reduced in their roads, although there was a split on whether vehicle numbers had gone up or down in their road. The technical data shows that the number of vehicles significantly reduced within the Village area, with some roads having seen a 90% reduction in volume.

As stated in the community engagement section there are areas that residents feel require improvement, including Church Lane, Vestry Road, East Avenue and Third Avenue. It should

be noted that improvements to the scheme (more traffic calming and the right turn ban in the morning) had happened prior to this review. The result of this has been a reduction in vehicle numbers in the morning peak.

When considering Aim 1, it is clear from both the community feedback and the technical data that the roads within the Village have seen a benefit, from the implementation of the scheme.

One key concern noted within this report was that vehicles avoiding the Village would be displaced onto the surrounding main roads. Whilst there is no desire to increase the level of traffic on the main roads, those that undertake longer journeys who were travelling through the Village are now likely to be using these main roads. Although the A roads (Lea Bridge Road and Hoe Street) have seen slight increases the most important element is the highway performance.

The extensive bus network analysis, although not perfect, does give us a good indication of the surrounding network performance. The detailed key performance indicator analysis shows there has been little change in performance on Lea Bridge Road, however there has been a slight reduction on Hoe Street. This includes increases in bus journey times, a slight change in passenger wait times and a reduction from 99% to 98% of its scheduled mileage.

Overall, the changes have made big improvements to the levels of traffic within the Village and residential areas, which in turn will make a big difference to those living in the area. The data suggests there has been a slight knock-on effect to the main roads, but this is not at a level which would diminish the positive effects on the residential area. Therefore, Aim 1 has partially been achieved with improvements to be made.

6.1.2 Aim 2 – Improve road safety on the roads within the area

Road safety should be a priority when considering any form of traffic management or changes to the road layout. It is therefore vital to assess the impact of the scheme to make sure safety for all road users has not been adversely affected as a result of the changes.

There are a wide range of factors that affect road safety and the severity of collisions but vehicle speeds are often a key factor in influencing both the risk of a collision and its severity.

Summary of impact:

- The mean speed recorded on the 12 roads tested within the Village area had reduced from an average of 17.1mph to 15mph after the implementation of the scheme.

- The 85th percentile speeds within the Village were previously averaging just above the speed limit at 20.9mph; this has reduced to a safer average of 18.5mph following the introduction of the scheme.
- All of the roads that were previously operating with an 85th percentile speed greater than the speed limit saw positive reductions, suggesting increased road safety within the Village area.
- Despite seeing increases in traffic volume, the three surrounding boundary roads saw reductions in average mean speed and 85th percentile speed as a result of the scheme.
- Collision data from TfL revealed there were 15 recorded collisions within the Village area in the three years before the changes, no collisions were recorded in the 11 months afterwards.
- The number of collisions recorded on the three boundary roads in the 11 months after the scheme were shown to be approximately the same as the three year average recorded before the scheme. However, the number of serious collisions has reduced. Pedestrian collisions on Hoe Street appear to have increased in the short term and this requires further monitoring, but collisions at junctions where blended crossings have been installed have decreased significantly. This suggests that the additional traffic that moved on to these boundary roads has not been detrimental to road safety.
- Visitors in the area suggested that road traffic safety in the area was good with 86% of responses falling in to the very good or fairly good categories.
- 46% of visitors said that road safety in the area has improved as a direct result of the scheme, with no one suggesting it was worse. The remaining responses were neutral.
- 45% of residents agreed that their streets felt safer at night, with 10% disagreeing and the remaining responses were neutral.
- 41% of residents said they could see where they were going at night better than before, with 9% disagreeing and the rest neutral.
- Junction assessment using LCDS methodology found that all tested junctions in the area scored better than before the scheme. This was attributed to improvements to cycle safety at junctions, as well as significant decreases in traffic volume and 85th percentile speeds.

Conclusion

Aim 2 is very important in every scheme and is taken extremely seriously in the design of the road layout. The collision reductions to zero in the first 11 months compared to 15 in the previous three years within the village can be seen as a first step towards successfully achieving this aim. It is hoped this trend continues going forward.

Residents and visitors felt that vehicle speeds had reduced and the roads were safer with 46% of visitors saying that road safety in the area has improved as a direct result of the scheme, with no one suggesting it was worse.

A technical review has also shown that the design provides safer journeys with an improved cycling level of service. This along with a Road Safety Audit, which only picked up minor alterations, showed a good understanding and quality of design.

One key concern has been the introduction of new infrastructure especially blended 'Copenhagen' crossings. We acknowledge and appreciate residents' concerns over their use and driver behaviour, however from a statistical collision perspective they have performed well since their introduction.

The review has demonstrated that the scheme has improved road safety and there is no technical evidence to suggest that this will not continue to be the case. Therefore, to date, Aim 2 has been successfully achieved, although we do caveat this with the fact that we have only been able to analyse collision data from 11 months after the scheme was introduced.

6.1.3 Aim 3 – Make it easier for people to walk and cycle around the Village area

One of the aims of the scheme was to encourage more walking and cycling within the area by improving the ease with which pedestrians and cyclists could travel around the Village.

Summary of impact:

- Walking is the biggest single mode of transport for regular journeys with 28% of residents stating this was their primary mode of regular transport. Forty three percent (43%) of respondents who live in the Village area said they do not own a car and instead rely on other modes of transport to travel.
- Residents were asked whether the number of cars, bicycles or walking trips had changed as a result of the scheme, 28% had increased their cycling trips and 18.6% were walking more since the introduction of the scheme.
- Twenty-nine per cent of households in the area own at least one bicycle. Of those, usage was high, with 75% suggesting they use a bicycle at least once per week.

- Visitors were asked what they thought of the general environment for walking and cycling. Eighty-nine per cent responded positively, with 49% saying it had improved as a direct result of the scheme and just 2% saying it was worse.
- Visitors responded very positively to the question about the general layout of the area with a 100% positive response and 97% saying it had improved as a direct result of the scheme.
- Cycle counts have shown that some roads have seen reductions while others have seen increases. Orford Road, Church Lane and the north-south route on Copeland Road and Pembroke Road saw some of the most significant increases. This suggests that the modal filters (road closures) preventing the north-south rat-run have made this route more attractive to cyclists and more are now visiting the Orford Road area.
- Junction assessment using LCDS methodology found that all tested junctions in the area scored better than before the scheme. This was attributed to improvements to cycle safety at junctions, as well as significant decreases in traffic volume and 85th percentile speeds

Conclusion

One of the core aims of the scheme was to promote and make it easier for people to walk and cycle. Walking is the most used primary mode of transport in the area, and as borough-wide car ownership levels are reducing, this makes the aim even more important.

With Aim 1 and Aim 2 being met this makes a big contribution towards achieving Aim 3. Although building a safer, less vehicle dominated area does not automatically increase walking and cycle levels. As part of the process we have actively promoted and encouraged walking and cycling in the Village and across the borough, including cycle training with schools, residents and visitors. This combined effort seems to be working with 18.8% of residents saying their average walking trips had increased since the introduction of the scheme, and 28% increasing their cycle trips.

The cycle counts in the Village have shown an increase in the number of cyclists and as surrounding roads are improved it is expected this will continue to increase.

The feedback received shows improvements in the number of people walking and cycling and that resident and visitor perceptions of the facilities have also improved.

Therefore, Aim 3 has been successfully achieved.

6.1.4 Aim 4 - Make the Village area more attractive for residents and visitors

An important aspect of improving the environment for local residents and encouraging people to visit the area is to ensure that the Village is perceived as an attractive and desirable location.

Summary of impact:

- Since the introduction of the scheme, more businesses reported a decrease in the number of visitors and customers, compared to those that reported an increase.
- Seventy-nine per cent of business owners expressed concern at the amount of short stay parking and 77% of business owners surveyed on Orford Road responded negatively to the 10am to 10pm restriction.
- Businesses had a mixed response to the general layout of the area with 46% negative responses and 39% positive.
- Visitors to Orford Road, on the other hand, were very positive in their perception of both the general appearance of the area and the Village Square area. Almost all (99%) said the appearance had improved since the introduction of the scheme.
- All (100%) of visitors said they were likely to recommend visiting the area to someone else, with 94% saying they were more likely to make a recommendation as a result of the scheme.
- Residents were positive about the changes to public spaces in the area with 53% giving a positive response compared to 15% negative.
- Residents suggested that the main reasons why their number of trips to Orford Road had increased was because the area was more pleasant/ nicer, there were better shops and restaurants, more space to walk, a more social atmosphere and it feels safer for children.
- Overall 55% of residents' felt positive about the scheme compared to 23% who felt negatively.
- In response to how easy visitors found navigating the area, 98% were positive with 75% claiming that this had improved as a result of the scheme.
- Businesses said that navigational signs in the area were poor with 64% negative responses and 20% positive.
- Both residents and visitors said their number of trips to the Orford Road area had increased since the scheme was introduced.

Conclusion

This aim is about ensuring that the residential area is an enjoyable environment to live, relax and travel in. The works to ensure this happen included large-scale projects like the transformation of Orford Road to medium scale projects like the trees and planting on the modal filters to the small pieces of art work on rail bridges and the wayfinding on the bollards.

The review identified that businesses were concerned over the removal of through traffic and potentially their customers. The survey with businesses showed that many believe they had reduced customers especially during the weekday since the introduction of the scheme. Although the majority of the businesses did agree that the material used in Orford Road and the look of the scheme was good, concern was still raised on short stay parking and loading.

Visitors appeared to have a vastly different opinion of the scheme with high percentages saying that they like the appearance and that it had improved since the scheme was introduced. This led to 100% of visitors saying they would recommend to a friend and they have increased their trips to the area. Residents have also indicated that their trips to the local shops had increased.

Overall, areas of public realm also saw positive feedback from residents and community groups.

The introduction of the scheme has seen a significant change to the road layout and the travel movements that can be made, and this was likely to require time for residents, visitors and businesses to get used to. The surveys were completed approximately one year after implementation and the positive part of this is that the look and feel of the scheme has impressed all and visitors are keen on the area. They are in favour of recommending to others and increasing their own trips. As this influence spreads and the road layout changes become well known it is likely more and more visitors will come to the area.

The results of the review suggests that this Aim been partially achieved but due to the concerns by businesses and work should be done to help promote local businesses in the area.

7. GOING FORWARD - RECOMMENDATIONS

The review has extensively looked at all elements of the Walthamstow Village scheme and concluded that overall it has generally been successful in achieving the four core aims. Clearly, however, there are areas where changes could improve the scheme further as shown in the community feedback that we have received and the data that has been collected and analysed. We are committed to making further improvements and adjustments where possible to make sure the scheme is as good as it can be. This is however likely to require additional funding, investigation and engagement with local residents. It is therefore likely that some of the recommendations can be delivered in the short term while others may take longer

7.1 Church Lane/East Avenue

Evidence from the technical data and community engagement suggests that Church Lane, Vestry Road, East Avenue and Third Avenue continue to be used by non-local traffic travelling through the Village. Additional measures have been put in place that have improved the situation, especially in the morning peak to the point where vehicle levels are lower than before the scheme. A range of suggestions have been put forward by the local community and further work is now needed to explore possible options for reducing the volume, speed and impact of traffic on these roads.

In addition, the community have told us that the junction of Vestry Road and East Avenue is a key concern to them. The junction is next to a well-used park and on the walking-cycling route from the Town Centre to Orford Road, which has become a more popular route. Although collision records have improved in the area it is recommended that further traffic calming measures or a flat-topped speed hump (speed table) are considered for the junction

Action – we will undertake some initial investigation work this financial year (2017/18) to explore possible options and will look to secure funding next financial year (2018/19) to develop plans in more detail, engage with the local community and deliver any further changes, subject to local support. Subject to available funding we will try and take forward improvements to the Vestry Road/East Avenue junction this financial year as well as any interim measures that can be delivered to reduce the impact of traffic using these roads

7.2 Business improvements

Results from the community surveys show that visitors and residents support the overall improvements to Orford Road. Almost all (99%) of visitors said they like the area and would recommend visiting the area to someone else and 47% said their visits to the area had increased.

Feedback from businesses agreed that the area had improved with positive responses on the appearance of the scheme, the materials used, and the public realm area. Their main concern was parking, loading and servicing. In order to improve this it's recommended that occupancy surveys be undertaken on short stay bays to understand their existing pattern of use, if there is a requirement for more bays, and if existing bays should be repositioned.

In addition, businesses were concerned over the lack of signage and wayfinding. It is recommended additional wayfinding signs are introduced in the Village and we continue to work with businesses to promote the area.

Action – we will undertake parking occupancy surveys in and around the Orford Road assess current provision and look to take forward any proposed parking and loading amendments this financial year. This will also include a review of other parking provision in the Orford Road area including residents bays, car club bays, etc

Action – we are currently working on a comprehensive wayfinding strategy for the borough including on-street signage and a new digital platform. Some of the proposed on-street signage elements have already been trailed in the village. We will continue to develop our overall wayfinding strategy and will implement further improvements in-line with the timescales for the overall strategy

7.3 Road safety audit

The collision record within the Village has improved suggesting that the design has succeeded in making the area safer. The independent safety audit did pick up a number of key points and it is recommended that consideration is given to each, particularly how the design can be improved to further ensure safety in the area for all users.

Action – We will review all recommendations set out in the Safety Audit report and will aim to make the necessary changes this financial year. Where more substantial works are required we will look to secure funding next financial year to take these forward

7.4 Orford Road timing

The 10am to 10pm restriction within Orford Road was discussed at length in each community group meeting and during the business surveys. It appears that residents and visitors favour the restriction and want further restrictions to make the road safer during the morning peak. However, many businesses have the opposite opinion and would like the hours reduced to allow more time for through traffic and extend loading times. When considering the aims of the scheme, a reduction in the time restriction is likely to reduce the benefit and overall success of the changes against the scheme's aims. An increase in time may well further improve the scheme but this could have a negative impact on businesses for loading and running operations. Therefore, it's recommended that the restriction time remains the same at present.

Action – For the time being we intend to keep the Orford Road timed restriction as 10am – 10pm. This does not mean that we will not review this again at some stage in the future.

7.5 Emergency services

The emergency services are a key stakeholder for us and any scheme or changes to the scheme will continue to be presented to them for discussion before implementation.

Action – We recognise that the potential impact of the changes on the Emergency Services is a key concern for parts of the community and will continue to work with them closely. Should the Emergency Services raise any specific issues with us we will aim to resolve these as quickly as possible

7.6 Main roads – Lea Bridge Road

The collision analysis shows there has been an improvement in road safety. However, now that more cyclists are using the residential village roads there has been an increase in collisions at the Lea Bridge Road and College Road junction, particularly for cyclists crossing the road. Further investigation is required to develop and implement a local safety scheme.

Action – The Lea Bridge Road/College Road junction will be upgraded in the next 12 months as part of the Lea Bridge Road improvement scheme. Once the Lea Bridge Road scheme has been introduced we will monitor the junction closely to see whether any further adjustments or changes are required

7.7 Addison Road, Beulah Road and Orford Road

The implemented scheme changed the one-way working of Orford Road to Addison Road via Beulah to two-way. Although this included a few changes to some kerb lines, it was noted that the north section is quite narrow to allow for the southbound bus route and vehicles travelling north bound. It is recommended that this section is expanded to allow vehicles to drive through easier.

Action – We will investigate options for improving the junction this financial year. Subject to available funding we will try and take forward improvements to the junction this financial year but if this is not possible we will look to secure funding next financial year to take forward any identified changes

7.8 Shernhall Street

Vehicle volume has increased on Shernall Street and we implemented an improvement scheme in late 2016 to try and reduce the impact of traffic using the road and improve road safety

Action - We will monitor the scheme as part of a separate study and will look to address any issues.

7.9 Buses

In general, the bus network seems to be working well with the majority of buses running close to their scheduled times, however, there a few variances across the network.

Action – We will continue to work with TfL Buses across the network to monitor performance and improve services.

7.10 Going forward

The Village review has been an extensive process. We have considered the views of visitors, residents and businesses, as well as extensive technical data. The report has highlighted positive changes, as well as concerns, and developed a number of recommendations.

The recommendations will be taken forward following investigation, design and community engagement stages where appropriate.

Further comments or concerns from residents are welcome and will be considered, but beyond those mentioned in the recommendations, any new concerns will need to be assessed against other priorities across the borough.

We want to take this opportunity to thank everyone who has been involved in the review, particularly local residents, groups and businesses, your input has been critical. Together we will continue to make Waltham Forest a better place for everyone.

ENJOY WALTHAM FOREST

APPENDIX 1 MAP OF WALTHAMSTOW VILLAGE IMPROVEMENTS

WALK CYCLE ENJOY | TRANSPORT FOR LONDON | MAYOR OF LONDON | Waltham Forest