

2018

# Road Safety Improvements in Newdigate Village Feasibility Report



2020 Consultancy

Version 1

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## 1.0 Introduction

2020 Consultancy has been commissioned by Newdigate Parish Council to undertake a feasibility study to establish the current issues with road safety and identify the most suitable improvements within the village of Newdigate, Surrey.

The study area is illustrated in figure 1 below and includes:

- Broad Lane
- Henfold Lane
- Kingsland
- Parkgate Road
- Rusper Road
- Village Street

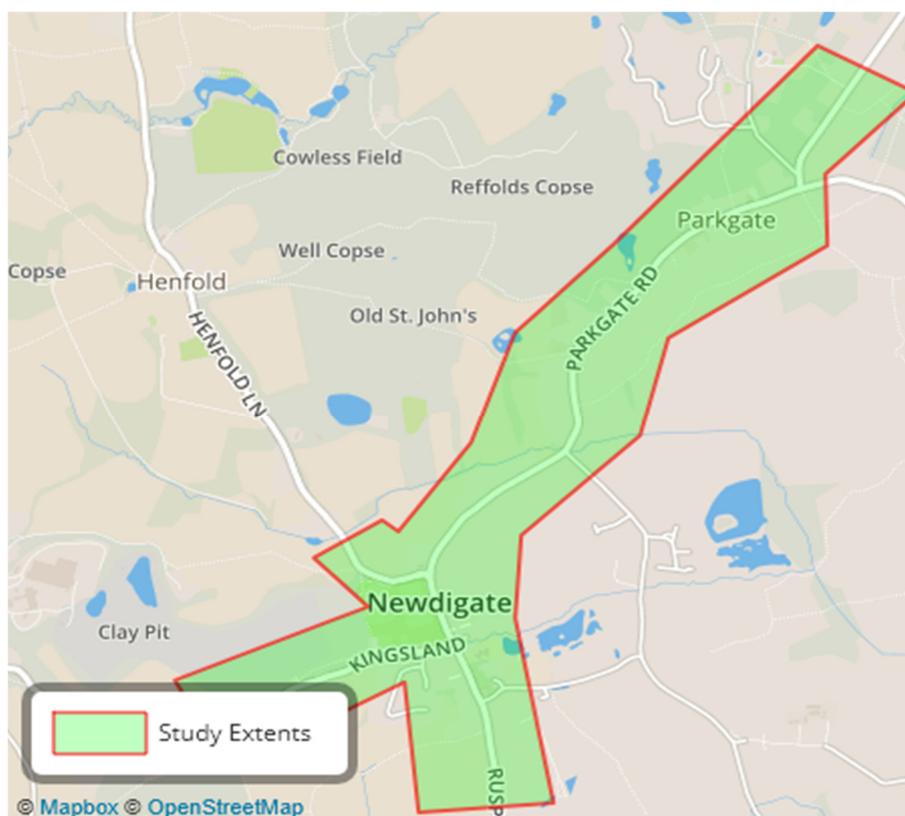


Figure 1 – Boundary of the feasibility study

### 1.1 Background

Newdigate is a village and civil parish in the Mole Valley district of Surrey. It is located to the east of the A24 road between Dorking and Horsham, and is 13 miles from Guildford and 25 miles south of London. Neighbouring parishes are Charlwood, North Holmwood, South Holmwood, Leigh and Capel. Newdigate has a village shop with a post office and two public houses as well as many small businesses. House prices in Newdigate are considerably higher than in nearby North and South Holmwood and the area is part of the London Commuter Belt. The nearest railway station is Holmwood railway station which is 1.7 miles away from the village centre. The 2011 Census recorded a parish population of 1,749 in 724 households.

Newdigate Parish Council is intending to improve road safety within the village by exploring a number of measures to assist in speed reduction and driver behaviour. This in turn will improve road safety, the attractiveness of the village and increase the likelihood of sustainable forms of transport becoming more popular such as cycling and walking.

The feasibility report comprises of the following:

- Extension of the 30mph along Parkgate Road, Henfold Lane, Kingland, and Rusper Road;
- Improvements to the 30mph/40mph speed limit terminal gateways along Parkgate Road, Henfold Lane, Kingland, and Rusper Road;
- Installation of pedestrian crossing
- Installation of formal 20mph zone outside Newdigate Infant School
- Installation of three Vehicle Activated Signs
- Junction improvements at Village Street / Kingsland
- New 30mph repeater signs with increased conspicuously and supporting 30 roundels on the road surface;
- Refresh road markings in the village
- Readjust edge of carriageway line to create narrower running lanes
- Increase junction warning signage on approach to key junctions
- Junction improvements at Village Street / Henfold Lane

This report presents the feasibility study for the viability of the proposals and includes the following elements:

- Assessment of existing situation
- Feasibility design and evaluation
- Recommendations on the next steps to implement the scheme

## 2.0 Existing Situation

### 2.1 Traffic speed into and through Newdigate village

On all approaches into Newdigate village there is an existing 40mph speed limit. The 40mph and 30mph terminals are located close to the village centre, which is likely to result in higher speeds through the village. Whilst the 30mph speed limit should be within a small radius to the village centre to increase compliance of the speed limit, it's felt that the 30mph speed limit should be extended to reduce approach speed. Traffic speed entering the village from all directions appears excessive and above the 30mph speed limit. Automatic Traffic Surveys (ATC) were commissioned to support this theory. The survey locations were chosen to determine traffic speed on the approach to the village centre. Figure 2 shows the locations of the surveys. The surveys were installed on Wednesday 29<sup>th</sup> August 2018 and were in-situ for seven days inclusive.

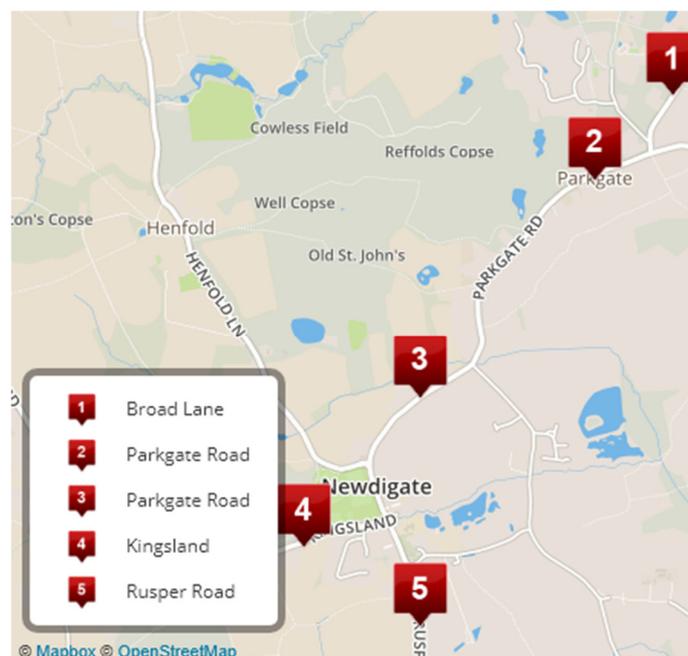


Figure 2 – Locations of ATC Surveys

The results demonstrate that traffic speed is lower the closer to the village centre, which is expected as the location becomes denser and more populated. Traffic speed is greater from the north although this is further away from the village centre. The average speed demonstrates that sites 2,3, and 4 have similar mean traffic speed. Site 2 (Parkgate Road) has an average speed of 35mph travelling northbound and 33.5mph travelling southbound. Site 3 (Parkgate Road) has an average speed of 36.7mph travelling eastbound and 36.2mph travelling westbound. Site 4 (Kingsland) has an average speed of 34.0mph travelling eastbound and 34.8mph travelling westbound. Site 1 (Broad Lane) and site 5 (Rusper Road) have greater difference in traffic speed due to the location. Broad Lane is further away from the village centre and has higher average speed (38.4mph NB & 36.7mph SB) and Rusper Road is closer to the village centre and has lower average speed (31.5mph NB & 31.6mph SB).

The survey sites 3,4, and 5 were located within close proximity to the existing 30mph/40mph speed limit terminals. Extending the 30mph speed limit further away

from the village centre is likely to result in an approximate average speed reduction of 3-4mph. Usual traffic behaviour demonstrates a period of speed reduction from the approach to a slower speed limit through to approximately 100m into a slower speed limit. This is especially the case in rural villages. Therefore, with the existing 30mph terminals traffic is likely to be within the village as their speed reduces to the slowest speed it will reach (unless impacted by other influences such as parked vehicles and stationary traffic at junctions). This gives scope to extending the 30mph limit further away from Newdigate village centre.

2020 Consultancy have viewed the ATC data in detail and considered the likely impact on average speed at the survey locations if the 30mph speed limit has been extended. Site 1 (Broad Lane), and Site 2 (Parkgate Road) are unlikely to see any difference in traffic speed as these sites are considered too far away from the village to be considered. Site 3 (Parkgate Road) is likely to see an average speed reduction of approximately 2-3mph due to the location and environment. Site 4 (Kingsland) is likely to see an average speed reduction of 3-4mph and Site 5 (Rusper Road) is likely to see an average speed reduction of 3-4mph. For consideration of a lower speed limit the average speed needs to be within 10% plus 2mph of the speed limit. Therefore, to extend the 30mph speed limit the average speed should not be greater than 35mph. Parkgate Road has an average speed of 36.45mph in both directions meaning it's slightly over the threshold. However, average speed can be reduced through additional measures such as gateway treatments, adjustments to the road markings, and increased conspicuously of the 30mph repeater signs. These are all discussed in section 4 of this report. Implementing some of these measures will almost certainly result in the required speed limit reduction to extend the 30mph speed limit.

Reviewing the ATC data in greater detail demonstrates that traffic calming is required in Newdigate as well as the 30mph speed limit extension.

91% of traffic travelling east through the ATC Site 3 (Parkgate Road) are driving at or exceeding 30mph. Whilst this percentage is high, traffic is just approaching the 40mph speed limit terminal and will be speeding up accordingly. 87.9% of traffic travelling west (towards the village) are driving at or exceeding the 30mph speed limit. 79.5% of traffic travelling east (towards village) through the ATC Site 4 (Kingsgate) are driving at or exceeding 30mph. 84.0% of traffic travelling west are driving at or exceeding 30mph although traffic is just approaching the 40mph speed limit terminal and will be speeding up accordingly. As expected Site 5 (Rusper Road) has lower amounts of traffic travelling at or exceeding 30mph with 64% in both directions.

The results from the ATC surveys are summarised in tables 1 – 5 below. The full ATC data for all five sites can be viewed in Appendix A of this report.

ATC Location	Traffic volume	Ave Traffic Speed	85 <sup>th</sup> Percentile
Broad Lane (NB)	11374	38.4mph	45.4mph
Broad Lane (SB)	10942	36.7mph	44.8mph

Table 1 – ATC summary data for Broad Lane

ATC Location	Traffic volume	Ave Traffic Speed	85 <sup>th</sup> Percentile
Parkgate (EB)	16775	35.0mph	41.6mph
Parkgate (WB)	16109	33.5mph	39.9mph

Table 2 – ATC summary data for Parkgate Road

ATC Location	Traffic volume	Ave Traffic Speed	85 <sup>th</sup> Percentile
Parkgate (EB)	16116	36.7mph	42.0mph
Parkgate (WB)	15601	36.2mph	41.9mph

Table 3 – ATC summary data for Parkgate Road

ATC Location	Traffic volume	Ave Traffic Speed	85 <sup>th</sup> Percentile
Kingsland (EB)	11082	34.0mph	39.5mph
Kingsland (WB)	10551	34.8mph	40.4mph

Table 4 – ATC summary data for Kingsland

ATC Location	Traffic volume	Ave Traffic Speed	85 <sup>th</sup> Percentile
Rusper Road (NB)	10445	31.5mph	37.9mph
Rusper Road (SB)	9945	31.6mph	37.4mph

Table 5 – ATC summary data for Rusper Road

Apart from the 600mm terminal signs as you enter the 30mph speed limit there is no measures in place to reduce traffic speed into the village. Therefore, it's likely that traffic speed will not reduce to the sufficient level through the village. Walking through the village can feel uncomfortable as a result of excessive speed, especially during peak periods where traffic volume is high. There have been a number of reported collisions on the approaches to the village, including a fatality on Henfold Lane. This suggests that the speed of traffic isn't suitable for the conditions of the route.



Figure 3 – View of Village Street

## 2.2 Traffic volume and junction movements during peak periods

Concerns were raised about traffic volume and turning movements during peak periods i.e. between 7:30am-9am and 4:30pm-6pm. Therefore, our site assessment was extended into the evening peak period to understand traffic behaviour. To gain a more accurate understanding of traffic volume in the vicinity of the village centre we have only reviewed traffic volume data from Sites 3,4 & 5 as Sites 1 and 2 are considered too far away to provide a benefit to the village centre conditions.

Site 3 (Parkgate Road) demonstrated that 41.1% of traffic travelling eastbound between 7am and 7pm occurred during the morning and afternoon peak and 38.2%

of traffic travelling westbound between 7am and 7pm occurred during the morning and afternoon peak. Site 4 (Kingsgate) demonstrated that 38.9% of traffic travelling eastbound between 7am and 7pm occurred during the morning and afternoon peak and 36.3% of traffic travelling westbound between 7am and 7pm occurred during the morning and afternoon peak. Site 5 (Rusper Road) demonstrated that 42.7% of traffic travelling northbound between 7am and 7pm occurred during the morning and afternoon peak and 36.9% of traffic travelling southbound between 7am and 7pm occurred during the morning and afternoon peak.

All sites demonstrated a higher traffic flow in one direction. This is traditionally one direction in the morning and the opposing direction in the afternoon. This is expected due to tidal flow. This suggests that vehicles travelling through Newdigate undertake this journey on a frequent basis. This could be local traffic or commuter traffic.

Through the locations of the ATC surveys it's possible to highlight from what direction traffic is entering Newdigate from. This is an important consideration when prioritising proposals to address road safety. If the majority of traffic is approaching from the same direction, proposals that can be implemented within the area should be prioritised ahead of proposals that cannot be implemented i.e. junction treatments or safety outside of schools. Figure 4 below highlights the traffic volume from the north (Parkgate Road), the west (Kingsland) and the south (Rusper Road). It also provides a percentage breakdown, which demonstrates how it compares to each approach.

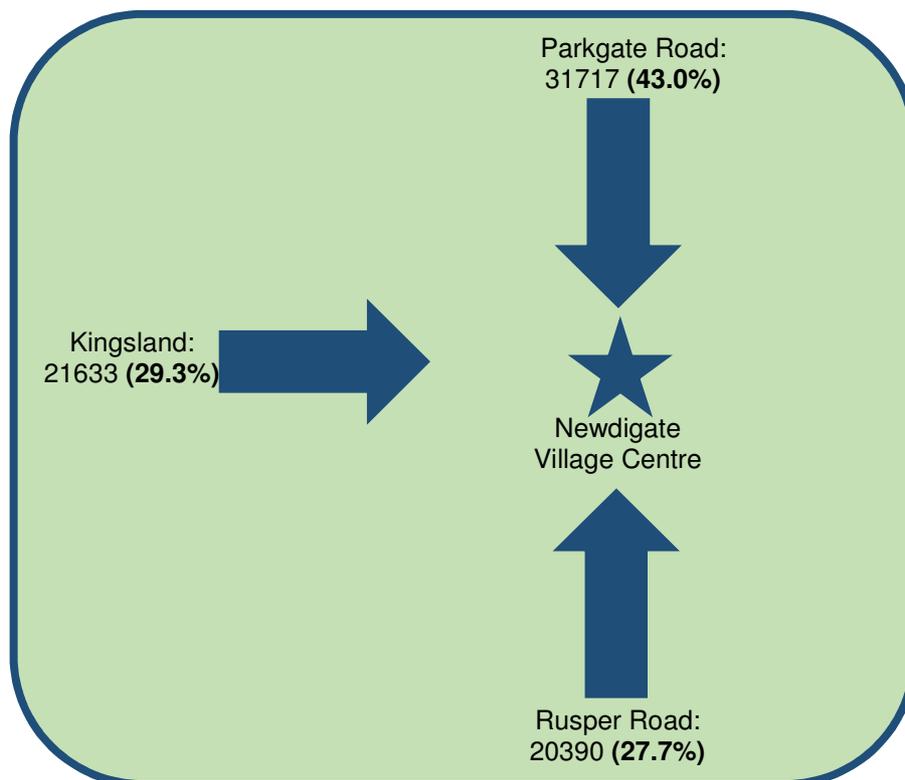


Figure 4 – Traffic volume for village centre ATC sites

The results demonstrate that the majority of traffic entering Newdigate approach from the north with 43% of volume passing through Site 3 (Parkgate Road). This is 13.7% (approximately 10300 vehicles) more than Site 4 (Kingland) and 15.3% (approximately 11000 vehicles) more than Site 5 (Rusper Road). These results confirm that priority

should be given to proposals that will address road safety approaching Newdigate village from Parkgate; followed by Kingsland then Rusper Road. However, Newdigate Infant School is located on Village Street, which leads into Rusper Road. It's felt that priority should be given to measures to safeguard children during school drop-off and pick-up times.



*Figure 5 – View of Village Street / Kingsland junction*

### 2.3 Pedestrian / vehicular safety at Parkgate Road / Henfold Lane junction

The Parkgate Road / Henfold Lane junction is in poor condition and is likely to cause confusion to drivers who are not from the area. The junction has a central island (although this is just overgrown vegetation and a signpost) with an entry and exit lane both north and south of the central island. However, the road markings have completely worn meaning drivers may assume that there is one entry lane and one exit lane. This significantly increases the likelihood of collisions occurring as traffic will naturally position itself at the same points of the junction. Traffic speed appears to be quite high around the junction and traffic approaching Parkgate Road from Henfold Lane approach at speed, breaking sharply if traffic is travelling along Parkgate Road. The situation is exacerbated by a fatal collision that occurred on the approach to the junction in 2013. As a short-term measure, the junction road markings require repainting. This should be done as a matter of urgency. In the longer term, a junction redesign should be considered and is discussed in section 4 of this report.



Figure 6 – View of Parkgate Road / Henfold Lane junction

#### 2.4 Overgrown vegetation along footways through village

There are a number of locations through Newdigate village where overgrown vegetation is encroaching onto the public footways creating narrow footpaths. This causes a safety concern for pedestrians, especially those with pushchairs or mobility scooters. In some locations it's possible that there is insufficient width for pushchairs and mobility scooters to proceed. This would require them to enter the carriageway. As discussed, traffic speed is often exceeding the 30mph speed limit making the pedestrian environment unwelcoming. Pedestrians in the carriageway increases the possibility of collisions occurring, which potentially could be fatal due to traffic speed. The vegetation may be on private land. Every effort should be made to identify the land ownership and arrange for the vegetation to be cut back to ensure footway widths are at the required standards. Its unlikely residents will choose active modes of travel such as walking and cycling with the existing situation.

#### 2.5 Traffic speed approaching junctions / visibility of 30mph repeaters

The signage and road markings through the village is poor in places with damaged signs and faded road markings potentially causing confusion to drivers approaching junctions. Erecting new signs and improving the conspicuously of existing advanced warning signs is likely to result in a reduced likelihood of vehicles overshooting junctions or braking sharply. There are a number of 30mph repeater signs located through the village as there is no street lighting. However, a number of these are not very visible due to the location, condition, and vegetation obstructing the signs. Whilst there are 30mph roundels to accompany the signs that are in better condition, it is felt that improving the conspicuously of these signs will result in better compliance with the 30mph speed limit.



*Figure 7 – View of Henfold Lane approach to Parkgate Road*

## 2.6 Safe crossing facilities for pedestrians

There are currently no safe crossing facilities for pedestrians throughout the village. Whilst there doesn't appear to be much demand for a formal crossing at most locations, there is high crossing movements along Village Street outside Newdigate Infant School, in particular at school drop-off and pick-up times. Due to the traffic volume and speed, particularly at peak periods it is felt that there should be a crossing facility in the vicinity of the school. This could be either an uncontrolled crossing, or formal crossing such as zebra crossing. A formal crossing would provide greater safety to pedestrians and would also act as a method to slow down traffic in the village. A PVM<sup>2</sup> survey should be carried out to support the most effective type of crossing.



*Figure 8 – View of Village Street*

### 2.7 Pedestrian / vehicular safety at Village Street / Kingsland junction

The junction of Village Street and Kingsland is very wide causing an increase in time for pedestrians to pass the junction. It is unknown if there is a specific reason for the junctions width and consultation with Surrey County Council is recommended before any alteration. Visibility for vehicles is also restricted, resulting in a need to creep out into Village Street to ensure it's safe to fully egress from the junction. Safety improvements for both pedestrians and vehicles should be investigated further with a view to narrowing the junction and improving the visibility splay. Traffic speed is excessive on the approach to the junction along Kingsland and there was a number of occasions during the site visit where vehicles had to brake sharply to avoid overshooting the junction. During school drop off and pickup times vehicles would park at the junction causing further visibility difficulties. It may be necessary to consider implementing some waiting restrictions at the junction.



Figure 9 – View of pedestrian crossing point Village Street / Kingsland

### 3.0 Accident Data

Accident data has been investigated as part of this feasibility study. Reviewing the Crashmap website for a period of five years from 2013 to 2017 has demonstrated that there have been seven collisions within the study extents. There has been a further eight outside the study boundary that haven't been included within this review to ensure priority is given to the village and approach to the village. One of the seven collisions was a fatality, which occurred along Henfold Lane on the approach to the Parkgate Road junction. Two of the seven collisions were serious; one occurring along Parkgate Road and the other along Kingsland on the approach to the Village Street junction. The remaining four collisions were classified as slight.

It is recommended that as part of any road safety improvement scheme addressed by Surrey County Council, consideration is given to these sites with a view for a more detailed investigation including analysis of the stats 19 form to identify any likely patterns. This should be prioritised based on the severity of the collision.

Details of the 16 collisions within the five-year period are shown below.

#### **Fatal**

##### **Henfold Lane**

20/04/2013 – Involving 3 vehicles with 2 casualties reported

#### **Serious**

##### **Parkgate Road**

1. 17/07/2016 – Involving 2 vehicles with 3 casualties reported

##### **Kingsland**

1. 14/07/2013 – Involving 1 vehicle with 1 casualty reported

#### **Slight**

##### **Parkgate Road**

1. 19/06/2017 – Involving 2 vehicles with 1 casualty reported
2. 17/10/2016 – Involving 1 vehicle with 1 casualty reported

##### **Kingsland**

1. 14/01/2017 – Involving 2 vehicles with 1 casualty reported

##### **Village Street**

1. 04/08/2013 – Involving 2 vehicles with 1 casualty reported

Two of the seven collisions occurred in the year 2017. This equates to 28.6% of the total number during the five years. Two of the seven collisions occurred in the year 2016. This equates to 28.6% of the total number during the five years. Three of the seven collisions occurred in the year 2013. This equates to 42.9% of the total number during the five years. Surprisingly, there were no collisions in the years 2014 and 2015. It is unknown whether there is a reason for this.

Table 6 below reveals the number of collisions each year over the five-year period.

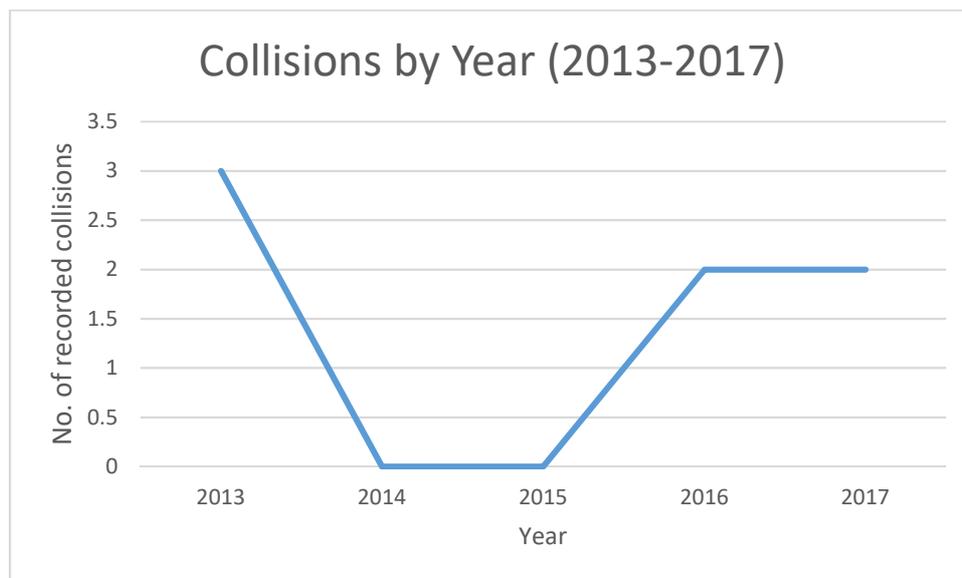


Table 6 – Collisions by year 2013-2017

Reviewing the collisions by time of year suggests there is a greater likelihood of collisions occurring in the summer. Four out of seven recorded collisions occurred during the summer months, which equates to 57% of the total number. There was one recorded collision in each of the other seasons, which equates to 14% of the total number.

Due to the close proximity of Gatwick Airport and additional traffic on the road network, it is a fair assumption that during the summer months there are greater numbers of vehicles travelling through Newdigate, which will increase the likelihood of a collision occurring. This is exacerbated by the probability that the drivers do not have a good understanding of the road network and the possibility that they may be in a hurry. Table 7 provides a breakdown of collisions over the four seasons.

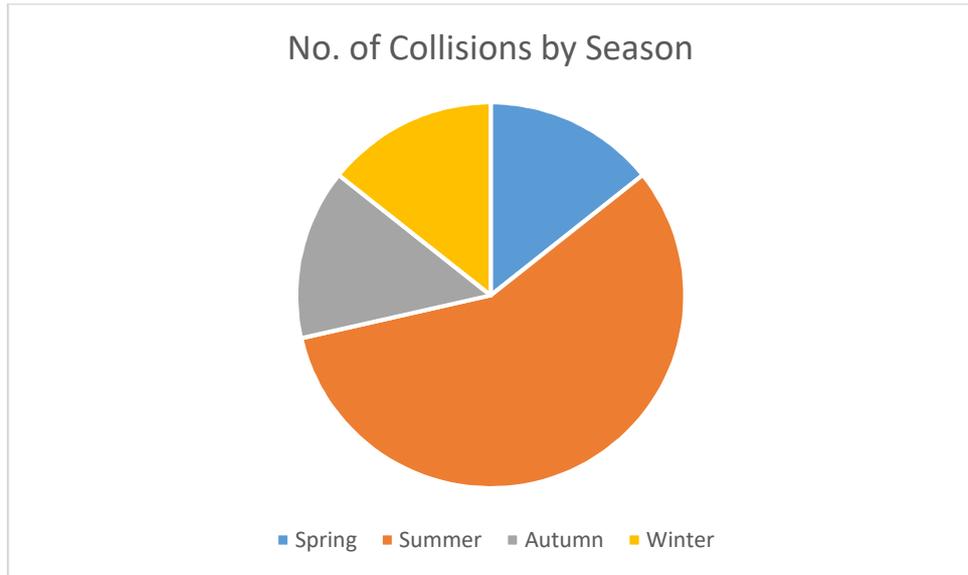


Table 7 – No. of collisions by four seasons

Figure 10 provides the locations for collisions in the study area.

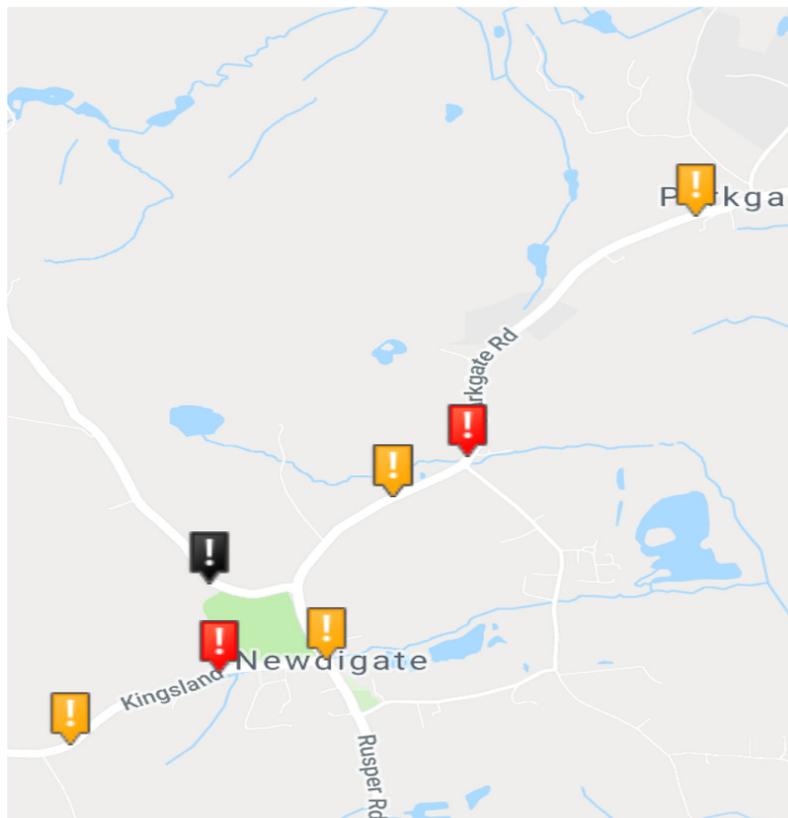


Figure 10 – Locations of collisions between 2013-2017

## 4.0 Feasibility Design

### 4.1 Extend 30mph speed limit further from village centre

The close proximity of the 30mph speed limit terminals to Newdigate village centre means there is a possibility of traffic travelling through the village at higher speeds. This is because traffic often waits until reaching a lower speed limit before reducing speed. In rural environments this can take a long period of time, resulting vehicles entering the village at speed. Effective speed limits do not start too soon. Introducing a 30mph speed limit a long distance from a built-up environment will result in a lower compliance rate. This is because a lower speed limit will feel uncomfortable in a rural area. However, there is scope to extend the existing 30mph speed limit on the approach to Newdigate from Parkgate Road, Henfold Lane, Kingland, and Rusper Road.

4.1.1 For this proposal to be effective it's vital the 30mph speed limit isn't extended too far from Newdigate as this will compromise speed through the village. The road layout of the routes into Newdigate are tight roads with restricted visibility due to heavy vegetation. This means that traffic speed will be naturally slower. Roads into the village also have areas with no centre line, which can be an effective method for reducing speed. Introducing the narrower edge of carriageway marking described in section 4.9 will assist with speed control further still. This will allow the 30mph speed limit to be extended approximately 250m-500m (dependent on road) further from the existing 30mph terminal signs. Figure 11 below provides a plan showing the proposed 30mph extension.

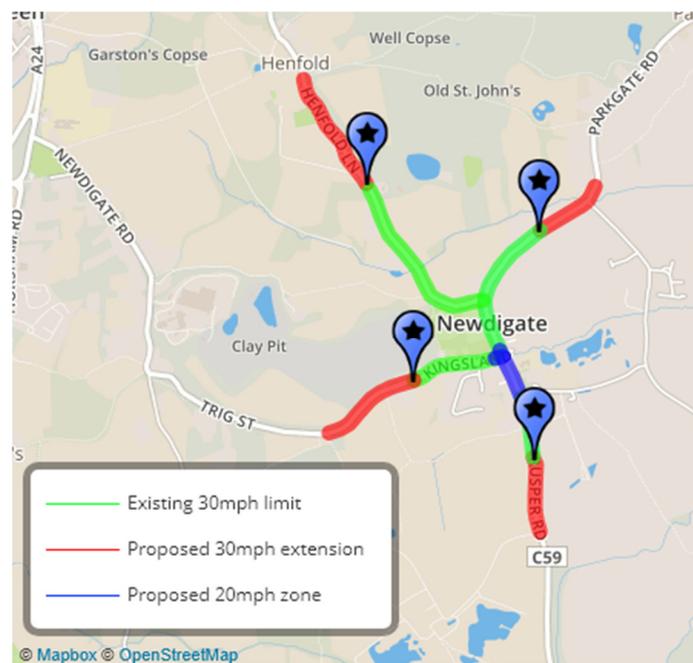


Figure 11 – Proposed 30mph extension & 20mph zone

4.1.2 Consultation will be crucial to this proposal. Engagement with the local Police is required to gain their support and buy-in. Objections are often received from the Police where insufficient engagement is undertaken. Ensuring the benefits and justification is provided the Police shouldn't object as the suggested extension is sensible and will improve road safety throughout Newdigate village. Extending the

30mph speed limit will require a Traffic Regulation Order, which involves legal work. Along with the design work (minimal) and implementation of new signage and road markings, the cost will be in the region of **£10,000-£15,000**. It is recommended to tie this proposal into the terminal gateway proposal discussed below. Using our cost and effectiveness matrix this measure is given a rating of **8/10**.

#### 4.2 Gateway treatment at 30mph terminals on approach to Newdigate

Speed entering Newdigate from all directions appeared excessive, meaning the introduction of the 30mph speed limit is being ignored. It is possible to redesign the 30mph terminal signs to create a more conspicuous gateway entry at all entrances to the village. Drivers are more likely to notice the terminal signs and it increases the likelihood of traffic speed reducing as vehicles enter the village.

4.2.1 A gateway treatment can vary in design, but average speeds can be reduced by approximately 1-3 miles per hour as vehicles enter the village. However, speed reductions of up to 5-6 miles per hour can occur within the first 20 metres of the gateway treatment which results in traffic speed being slower as vehicles enter the village rather than slowing down as they enter the village. There are no specific design requirements of gateway treatments providing the 30mph signs are clear and the correct dimensions (600mm in size and at least 2.1 metres above the ground).

4.2.2 The cost of gateway treatments can vary depending on the type of treatment implemented. The most common treatment is the construction of a gate arrangement which is usually in a white colour to contrast against the grass verge. Each gate is likely to cost approximately £1,000. Therefore, four sites are likely to cost approximately **£8,000** as it's important to have the gateway on both sides of the carriageway. Costs can increase depending on the materials used, design used, and where the delivery is from. It is also possible to install road markings to support the introduction of the new speed limit.

4.2.3 Red coloured surfacing can cause the speed limit to be much more visible when overlaying white roundels on the road surface. White road markings can be used to create virtual narrowings, which will cause traffic to slow down as the road appears to be narrower than it is. This can add a further 1-3mph average speed reduction on top of what can be achieved using the gateway treatment on its own. Installing coloured road surfacing and road markings is likely to add an additional £14,000 on top of the gateway treatment cost.

4.2.4 Implementing gateway treatments on all approaches to Newdigate village can be very effective in reducing traffic speed through the village. All entrances are suitable for a gateway treatment (although the design may need to be adapted for some entrances due to limited room available) and it's expected to see a speed reduction of approximately 5 miles per hour on the approach to the village if the gateway treatment is combined with the road surfacing and road markings. Using our cost and effectiveness matrix this measure is given a rating of **9/10**. Figure 12 and 13 below provides some examples of gateway treatments.



Figure 12 & 13 – Examples of speed limit gateway treatments

### 4.3 Installation of formal crossing along Village Street

Traffic volume and speed seems excessive in Newdigate. There is an Infant School located south of the village centre along Village Street. During peak periods there are high numbers of crossing movements as children go to and from school. The width of Village Street along with a frequent stream of vehicles results in difficulties in pedestrians crossing Village Street to enter the school. It should be possible to implement a formal crossing to enable pedestrians to safely cross Village Street to access the school. The most suitable crossing is likely to be a zebra crossing, which will give pedestrians the right of way. A zebra crossing will slow traffic down further, which has additional benefits for the village.

4.3.1 Implementing a zebra crossing will be a high cost measure. The usual process for implementing a zebra includes an assessment called a PVM<sup>2</sup> assessment where the number of pedestrian's crossing over an hour is counted against the number of vehicle movements in both directions over an hour. The approximate cost of implementing a zebra crossing is **£40,000-£50,000**. There are a lot of variables that need to be considered such as lighting and ducting as well as locating the crossing. There is also design, consultation, and legal fees that are required for implementation. Therefore, the total cost involved is likely to exceed **£75,000**. The illumination would need further investigation as the village doesn't have any street lighting.

4.3.2 There are logistical issues that will need to be addressed which may impact whether it's possible for a zebra crossing to be implemented along Village Street. There are a number of driveways which may restrict the location for the crossing. This will require further investigation. A zebra crossing usually results in average speed reductions as much as 5mph in the direct vicinity as the majority of traffic reduces speed when approaching a crossing in case pedestrians start to cross the road. It is also likely that vehicles will reduce after the crossing as they are within the centre of the village. If a zebra crossing can be implemented along Village Street our cost and effectiveness matrix of this measure is a rating of **8/10**. Figure 14 below shows an example of a zebra crossing.



*Figure 14 – Example of zebra crossing*

#### **4.4 20mph Zone outside Newdigate Infant School along Village Street**

Average traffic speed is 31.5mph at the ATC Site 5 (Rusper Road), which is south of Village Street and Newdigate Infant School. It's likely that average speed will be in the region of 27mph along this stretch of road based on the increased density, on-street parking, and location of school. There is an existing part time advisory 20mph speed limit along Village Street. Due to existing speeds it likely that compliance of the part time 20mph limit is low. To achieve a greater compliance and to improve road safety at the most vulnerable location within the village, consideration should be given to a 20mph zone. A 20mph zone differs from a 20mph speed limit. 20 mph zones require traffic calming measures (e.g. speed humps, chicanes) or repeater speed limit signing and/or roundel road markings at regular intervals, so that no point within a zone is more than 50 m from such a feature. 20 mph limits are signed with terminal and at least one repeater sign, and do not require traffic calming. 20 mph limits are similar to other local speed limits.

4.4.1 A 20mph zone can include physical and/or non-physical traffic calming measures. The effectiveness of a 20mph zone is far greater when physical traffic calming features are used. The most effective traffic calming feature for Village Street will be raised tables. A raised table is similar to a speed hump but covers the full width of the road and has a table top at least 6m long. This makes the feature more effective whilst reducing the drawbacks to speed humps such as noise and damage to vehicles. The length of the 20mph zone means two raised tables will likely be required to ensure the proposal is effective. The raised tables will be supported by signs and road markings in conjunction to the gateway signs at the start of the zone. Figure 15 below provides a plan demonstrating the recommended length of the 20mph zone.

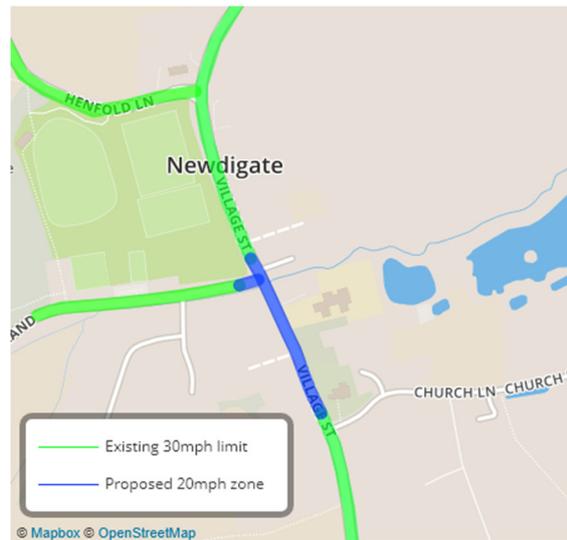


Figure 15 – Proposed 20mph zone Village Street

4.4.2 One of the major benefits of a 20mph zone in a rural environment, is that they can be implemented without street lighting. Traffic calming outside of 20mph zones require a regular interval of street lights. However, a zone doesn't require this as there is gateway signs and traffic speed should be slower. Statistically, 20mph zones with physical measures demonstrate greater speed reductions of approximately 7 miles per hour.

4.4.3 Depending on the location of the 20mph zone, it may be possible to incorporate the junction of Village Street and Kingsland within the zone. This would allow the introduction of raised junctions. Figure 16 below provides an example of a raised junction. This reduces traffic speed on the approach to junctions and on the junction. It also increases accessibility for pedestrians at the junctions. This would also allow the junction to be narrowed, which would improve pedestrian safety as there would be less carriageway to cross. As the junction would be within the zone, it would be easier to treat the junction to improve visibility for vehicles attempting to egress onto Village Street. Slower traffic speed would reduce the likelihood of vehicles overshooting the junction that was witnessed during the site visit.



Figure 16 – Example of raised junction

4.4.4 A further consideration is to implement the pedestrian crossing discussed in section 4.3 on a raised table to create a humped crossing. This results in traffic speed

slowing down on the approach to the crossing regardless of whether pedestrians are waiting to cross. This can assist in drainage design and overcome difficult locations where dropped kerbs and driveways can cause difficulties siting the crossing. Alternatively, raised tables could be constructed either side of the crossing which means traffic speed will be slower still upon reaching the crossing. Figure 17 provides an example of a humped crossing for effective traffic calming.



Figure 17 – Example of humped crossing

4.4.5 The cost of a raised table is depended on a number of factors such as the type used i.e. full width or channel to channel, the drainage requirements, and the size of the table top. The standard top is either 4 metres on a non-bus route or 6 metres on a bus route. Our recommendation for this site is 6 metres to reduce the impact on local residents and emergency services. A 20mph zone varies in cost due to a number of variables such as number of features, the type pf features, location, and consultation involved meaning estimating a cost is difficult. The approximate cost for a raised table is £8-10k along with further costs for design, consultation, and legal fees. Costs are greater for raised junctions due to the greater amount of table top. The cost of the 20mph zone signage and road markings will be low. Approximately £5,000 will be sufficient for this aspect. For the purpose of this study implementing a 20mph zone along Village Street is likely to cost in the region of **£30,000-£50,000**.

4.4.6 Implementing a 20mph zone along Village Street will be very effective in reducing traffic speed in the vicinity of Newdigate Infant School. We anticipate a speed reduction of approximately 6-8mph depending on the type of raised tables used. Using our cost and effectiveness matrix this measure is given a rating of **8/10**. Figure 18 below shows an example of a raised table.



Figure 18 – Example of a raised table

#### 4.5 Installation of Vehicle Activated Signs

There aren't any existing Vehicle Activated Signs in Newdigate village. Vehicle Activated Signs are one of the most effective non-physical methods for slowing traffic in a specific location. There are a number of different types of Vehicle Activated Signs that range in cost but also provide different results. Signs that flash "Slow Down" are likely to see average speed reductions of 1-2mph. Signs that display the actual speed vehicles are travelling are likely to see average speed reductions of 3-4mph. However, the signs are most effective within the first two to three weeks where drivers are often surprised by the sign illuminating and reduce their speed accordingly. This is especially the case for the signs that display motorists speed as they travel past.

4.5.1 Installing Vehicle Activated Signs at the most crucial locations in Newdigate village will cause speed reductions where the signs are located. If the signs are not in the most effective location it is unlikely that speed reduction will occur. Therefore, the siting of these signs is as vital as the type of sign purchased. It is recommended to install the signs as close to the main village centre as possible. Figure 19 below provides our initial thoughts on potential locations for Vehicle Activated Signs within Newdigate. This is based on the introduction of three signs, which is considered ideal for the location of the village. Two signs would be sufficient to achieve speed reduction.

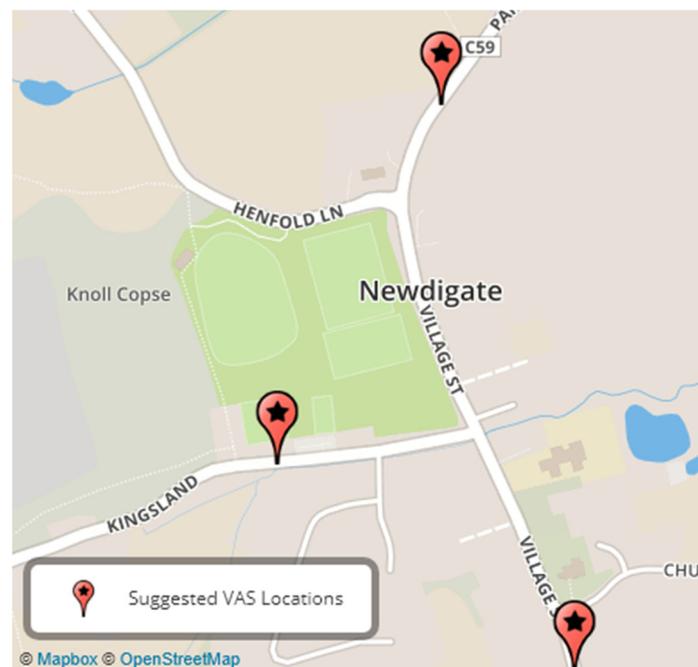


Figure 19 – Suggested VAS locations for Newdigate

4.5.2 The cost is dependent on the type of sign purchased. Due to the nature of Newdigate village with high traffic volume and excessive speed, in particular during the summer months, it is recommended to purchase the higher cost, greater effectiveness signs. Figure 20 provides an example of these types of Vehicle Activated Sign. These signs are likely to cost in the region of **£10,000-£15,000** per sign. Therefore, the total cost will be approximately **£30,000-£45,000**. Using our cost and effectiveness matrix this measure is given a rating of **9/10**.



Figure 20 – Examples of Vehicle Activated Signs

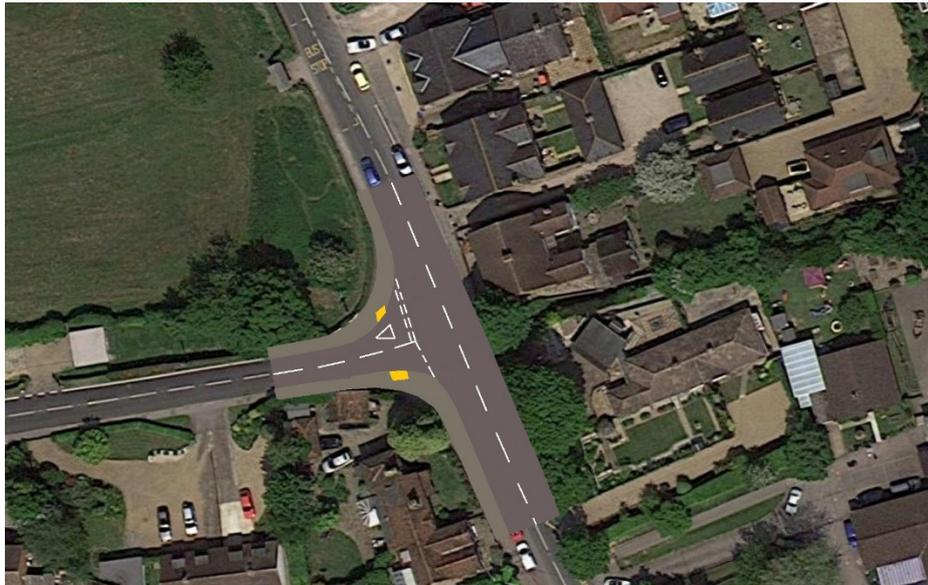
#### 4.6 Junction redesign at Village Street / Kingsland junction

As discussed within this study, the Village Street & Kingsland junction is a cause for concern with a number of vehicles recorded overshooting the junction, sharp braking, and egressing from Kingsland into Village Street when oncoming traffic approaching. There has been one recorded slight collision at the junction and one recorded serious collision on the approach to the junction within the last five years. However, it's likely there have been a number of damage only collisions that would not have been reported having analysed driver behaviour for a period of time. There are contributory factors for the issues described above. Visibility at the junction is poor resulting in a need to creep out into Village Street. Some traffic approaching the junction along Village Street are exceeding the 30mph limit, probably by at least 10mph. Junction warning signage is also in a poor condition.

4.6.1 From a pedestrian perspective the junction is wide resulting in a long period of time crossing the carriageway. Vehicle speed exacerbates the safety issue for pedestrians. Vulnerable road users such as children and the elderly are at greater risk due to potentially slower crossing times. It is felt that improvements should be considered at the junction to improve safety for pedestrians and vehicles. Any proposal will require further investigation, especially to determine if any reason exists why the junction is as wide as it currently is. The improvements could be implemented as low cost or medium/high cost.

4.6.2 Low cost improvements would be to address the road markings and signage. Improved advance warning and directional signage would be beneficial at the junction. The road markings could be improved to push the junction slightly further into Village Street to improve visibility. Hatching (similar to what is currently in-situ) would ensure vehicles do not encroach into the running lanes along Village Street. These improvements would cost in the region of £10,000 although this would result in little or no safety improvements for pedestrians. Therefore, it is recommended to consider the medium/high cost proposals at the junction.

4.6.3 The most suitable proposals to address both pedestrian and vehicle safety at the junction is to either narrow the junction through footway widening or to implement a central refuge island. Widening the footway at the junction will result in less time pedestrians are crossing the carriageway. There is sufficient room for vehicles to undertake any manoeuvre at the junction. Widening the footway at the junction will allow the junction to be pushed slightly further into Village Street with the alignment of the footway protecting vehicles at the junction from traffic travelling north along Village Street. Tactile paving should be implemented to support accessibility and to advertise the most suitable crossing location for pedestrians. Figure 21 below provides a sketch example of the junction with wider footways and slight intrusion into Village Street.



*Figure 21 – Sketch of potential junction redesign Village Street / Kingsland*

4.6.4 Alternatively a central refuge island could be constructed in Kingsland at the junction. This would mean the footway widths would remain existing. However, the central refuge island would allow pedestrians to cross Kingsland halfway resulting in greater opportunities to cross the junction. This proposal would need further investigation to ensure there is sufficient room for construction of the refuge island and to ensure it can be maintained. Accessibility improvements could be incorporated into the design. Figure 22 below provides a generic example of a junction with a central refuge island. The island could be constructed as a bolt down island.



Figure 22 – Example of central pedestrian refuge island

4.6.5 Both proposals will improve road safety at the junction for pedestrians and vehicles. Our recommended option would be to progress the footway widening option as this option offers slightly greater safety for pedestrians and vehicles. Both proposals are likely to cost a similar amount. However, the central refuge island will require more funding set aside for maintenance as there is a higher likelihood of damage. The approximate cost for the proposals is in the region of **£40,000-£50,000** depending on how much footway widening is undertaken and the type of refuge island implemented. There would be a need to carry out drainage design and check existing utilities, which could increase the costs considerably. Using our cost and effectiveness matrix this measure is given a rating of **7/10**.

#### 4.7 Replace existing 30mph repeater signs with yellow backed signs

There are 300mm 30mph repeater signs throughout the village as there is no street lighting. Without repeater signs and street lights a road is assumed to be the national limit for a single carriageway. However, the majority of the repeater signs are not conspicuous due to the size of the signs and their location (see figure 23). Vegetation obscures some of the signs and the condition is poor for the majority of signs. As a result of this drivers do not have a regular reminder of the speed limit. There are 30mph roundels to accompany the repeater signs, but these are traditionally less effective than repeater signs. To increase visibility and compliance the repeater signs could be replaced with yellow backed signs that will be more obvious to through traffic.





Figure 23 – Examples of speed signage in Newdigate

4.7.1 There is no speed enforcement signs, which suggests that there has been no enforcement undertaken recently and none planned in the future. As speed has been raised as a concern, it is recommended to lobby the local Roads Police Unit to request that Newdigate village is added to routine enforcement. There will be a requirement for camera warning signs to be installed before this can commence and it's recommended to undertake this at the same time the new 30mph repeater signs are installed. This is a low-cost measure as the only cost is the manufacturing and installation of the signs. Some design time will be required although this will be minimal. This proposal is likely to cost in the region of **£4,000 - £5,000**.

4.7.2 There will almost certainly be a speed reduction with the installation of yellow backed 30mph repeater signs. There will be sufficient numbers through the village to reinforce the speed limit and providing greater conspicuously of the signs will target motorists in a more effective manner. Research carried out on the usage of yellow backed signs supports this theory. Implementing yellow backed repeater signs generates a score of **9/10** using our cost and effectiveness matrix system. Figure 24 below shows an example of a road with yellow backed repeater signs.



Figure 24 – Example of yellow backed 30mph repeater sign

#### 4.8 Refresh all existing road markings

The road markings through the village have faded and are worn in places in particular the 30mph roundels (figure 25) that are designed to remind drivers of the speed limit. The edge of carriageway markings is worn in places and these markings can be useful in speed reduction as the width from the kerb can create a feeling that the road is narrower than it is. With faded markings the road can appear wider which is likely to be a contributor factor in traffic exceeding the 30mph speed limit. Junction markings are crucial to warn drivers to give way. The bus stop markings are also faded which may cause difficulties with vehicles waiting at bus stops. All road markings in the village should be refreshed with the edge of carriageway marking readjusted as discussed below.

4.8.1 There is no design requirement for this proposal apart from the relocation of the edge of carriageway marking. Therefore, officer time should be minimal. There may be a small speed reduction from refreshing the road markings as the 30mph roundel will act as an effective reminder to drivers and the edge of carriageway marking will assist in a speed reduction. However, the main benefit is the improvement to road safety in the village with the likelihood it will reduce the number of collisions, especially at junctions where collisions have been recorded.

4.8.2 The cost of refreshing the white lines is low. The local highway authority may have maintenance funding available to carry this out and it may be on a programme of work. However due to the poor condition of some markings along with collisions potentially being reduced with the refreshment of the markings, this should be prioritised. The cost of refreshing the markings through the village is likely to be in the region of **£5,000 - £10,000**.

4.8.3 This proposal will be effective throughout the village and may improve road safety, particularly around key junctions. It should result in a small speed reduction as discussed above. Using our cost and effectiveness matrix this measure is given a rating of **7/10**.



*Figure 25 – Example of faded road markings*

#### 4.9 Readjust edge of carriageway line to create narrower running lanes

An edge of carriageway marking can be a useful method of reducing traffic speed. This is because the road marking creates a narrower feel to the carriageway which results in drivers feeling less confident at higher speeds, so their speed reduces to be within their comfort zone. Although there is an edge of carriageway marking through the village, it's possible to readjust the marking to bring it further into the carriageway. This results in a visually narrower road width.

4.9.1 Readjusting the edge of carriageway road marking is considered a low-cost option. This should be done in conjunction with the refreshment of the white lines as described above. This proposal does not require any legal work or consultation to be undertaken. Guidance should be sought from Chapter 5 of the Traffic Signs Manual on the distances used, although no specific dimensions are listed. It is advised to be approximately 225mm to the edge of carriageway although this can be adjusted when needed. The approximate cost for this measure would be **£5,000 - £6,000** assuming it's carried out in conjunction with all white lining in the village.

4.9.2 Readjusting the edge of carriageway marking will likely result in a speed reduction through the village as drivers will feel that the road width is narrower and adjust their speeds accordingly. This is likely to yield a speed reduction of 2-3mph through the village. Using our cost and effectiveness matrix this measure is given a rating of **7/10**. Figure 26 shows an example of a road with the edge of carriageway marking further into the road.



Figure 26 - Example of edge of carriageway marking

#### 4.10 Increase junction warning signage on approach to key junctions

Traffic speed through the village suggests there is little or no regard for potential traffic emerging from side roads, in particular Henfold Lane and Kingsland. Near misses were noted during the site visit when vehicles travelling in excess of 30mph were required to brake sharply due to vehicles egressing onto Village Street due to restricted visibility and excessive speed.

4.10.1 There is junction warning signage in the village although a number of the signs are obscured by vegetation and the condition of the signs are poor. Increasing the visibility of the signage may encourage drivers to slow down on the approach to junctions. Out of the seven collisions that have occurred within Newdigate within five years, three have occurred within the vicinity of junctions. A lack of junction warning

signage may be a contributory factor in some/all of these collisions. This proposal can be accompanied by a supplementary plate that can provide some description which increases conspicuously further still. Alternatively, there is justification for these signs to be erected on yellow backing boards to increase the conspicuously of the signs and highlight the junctions in greater detail. The cost of new junction warning signage including additional signage is a low-cost measure. This proposal is likely to cost in the region of **£2,000 - £3,000**.

4.10.2 There may be a slight speed reduction through the village as a result of increased visibility of junction warning signage. This is likely to be in the region of 1-2mph. However, the increase in signage is likely to reduce the possibility of collisions occurring at junctions. Further investigation of the Stats 19 form may support this assumption. Increasing the junction warning signage through the village generates a score of **8/10** using our cost and effectiveness matrix system.



Figure 27 – Example of hi-visibility junction warning signs

#### 4.11 Junction redesign at Parkgate Road / Henfold Lane junction

Whilst the faded road markings at the junction of Parkgate Road and Henfold Lane make the junction dangerous, the junction itself appears to operate adequately. However, there is an opportunity to improve road safety. There is currently two exits and entrances to the junction separated by a grass central island. This allows traffic travelling south to use the junction north of the central island and traffic travelling north to use the junction south of the central island. However, there is no indication on priority, meaning there is a possibility for collisions if traffic from both directions are turning into Henfold Lane from Parkgate Road.

4.11.1 The junction could be formalised by implementing a give-way marking at one part of the junction. There doesn't appear to be enough demand at the junction to require two access points and two egress points. Therefore, the central island could be relocated and upgraded using a more traditional material such as tarmac. The central island could be relocated slightly further south from the existing island. This would then allow a small section of one-way to be implemented to enable traffic travelling north from Parkgate Road to access Henfold Lane. A give-way marking would be installed to require traffic travelling north to give way to traffic accessing Henfold Lane from a southbound direction. Directional signage improvements could

be incorporated into the new central island. Figure 28 below provides a sketch plan of the proposal.



*Figure 28 – Sketch of potential junction redesign Parkgate Road / Henfold Lane*

4.11.4 Traffic egressing from Henfold Road onto Parkgate Road would only have one access point. This will tighten the junction and prevent vehicles from accessing the junction at speed. As there has been a fatality on the approach to this junction, this proposal may prevent similar collisions occurring. Traffic travelling north along Parkgate towards Henfold Lane would have easier access, although the give-way marking would control speed.

4.11.5 The cost of this proposal is dependent on the type of central island used. It would require relocating so the existing island would need to be disposed. The estimated cost for the proposal based on traditional material is **£20,000**. Using our cost and effectiveness matrix the redesign of the Parkgate Road and Henfold Lane junction is given a rating of **6/10**.

## 5.0 The Proposals

Table 8 shows a list of all 10 proposals along with the cost effectiveness rating for each proposal. This has been calculated by considering how effective the proposal will be at reducing traffic speed or improving road safety compared to the overall cost of implementation. If a proposal is low cost and highly effective it will score high. If a proposal is high cost and not effective it will score low.

If a proposal is high cost and fairly effective it will score around 5. If a proposal is low cost and fairly effective it will score around 6. Low cost proposals will score higher than high cost proposals that achieve the same level of effectiveness.

The highest rated proposals for Newdigate village are rated as 9/10. This is because they are low or fairly low cost and will be effective at reducing traffic speed. The lowest rated proposal is 6/10. This is because it is unlikely the proposal will result in a speed reduction although it is hoped there will be a reduction in collisions.

Proposal	Cost Effectiveness Rating (out of 10)
Gateway treatment at 30mph terminals on approach to Newdigate	9
Installation of Vehicle Activated Signs	9
Replace existing 30mph repeater signs with yellow backed signs	9
Extend 30mph speed limit further from village centre	8
Installation of formal crossing along Village Street	8
20mph Zone outside Newdigate Infant School along Village Street	8
Increase junction warning signage on approach to key junctions	8
Junction redesign at Village Street / Kingsland junction	7
Refresh all existing road markings	7
Readjust edge of carriageway line to create narrower running lanes	7
Junction redesign at Parkgate Road / Henfold Lane junction	6

*Table 8 – Prioritised proposals for Newdigate*

## 6.0 Stakeholder Consultation

It will be necessary to carry out consultation with key stakeholders regardless of any options that are progressed. Key stakeholders include highway authority, local councillors, emergency services, and transport bodies such as bus and taxi. Some of the proposals also require consultation with the public. However, our recommendation is that consultation with local residents is carried out with all proposals to ensure adequate support.

Having carried out the feasibility report we have highlighted the three proposals that we consider to be the most effective or have the potential to be most effective at slowing traffic speed into and through the village of Newdigate and improve road safety for all road users. These have been prioritised and are shown below:

1. Gateway treatment at 30mph terminals on approach to Newdigate;
2. Installation of Vehicle Activated Signs;
3. Extend 30mph speed limit further from village centre.

As part of this feasibility report, Newdigate Parish Council have the opportunity to provide their comments and any recommendations they are particularly keen to see progressed further. Their comments will be provided below once they have had the opportunity to discuss the feasibility report in detail.

## 7.0 Conclusion

In conclusion to this feasibility report, it has been highlighted that measures are required to reduce traffic speed on the approach and through the village of Newdigate. Reducing traffic speed will improve road safety for all road users. Newdigate Parish Council who commissioned this report have had their opportunity to provide comments on the recommendations stated and their comments can be found in section 5.4 of this report.

2020 Consultancy have listed all the possible measures that we believe can improve road safety and reduce traffic speed. It is now up to Newdigate Parish Council how to proceed with the work that has been carried out. The Appendices at the end of this report highlight the possible work that we can continue to have with the project. However, it is necessary to get the buy in from the highway authority to progress these measures.

### 7.1 Next Steps

Following on from the feasibility report, Newdigate Parish Council have the opportunity to provide any comments they wish to include as part of the project. Following this, the Parish Council then need to escalate the findings of this report to the highway authority, Surrey County Council and District Council, Mole Valley District Council. This is to gain the buy-in from the relevant key stakeholders including those who can provide funding for the measures taken forward. Without this support the Parish Council may need to fund measures themselves with approval from the highway authority. The majority of the measures included within this report require work to be carried out by the highway authority.

7.1.1 If the highway authority is happy to approve the Parish Council carrying out work on the highway or are willing to fund one or more of the proposals, the next stage will be to carry out detailed design of the proposal(s). This will then be consulted on with key stakeholders. Some of the proposals require Traffic Regulation Orders to be created and advertised. The work can then be carried out on site.

## 8.0 Appendices

Appendix A provides the results of ATC surveys that were undertaken as part of the feasibility study. There are also additional services we can undertake if the appropriate documents and data is provided. These are shown below.

- Appendix B Feasibility Design Drawings
- Appendix C Stage 1 Road Safety Audit
- Appendix D Feasibility Study Construction Cost Estimates
- Appendix E Stakeholder Consultation