Highway Schemes

Highway schemes included in the UTP;

Scheme Reference	Scheme Name	Timescale	Page Number
HM1	Introduce a package of smarter measures such as travel marketing, travel plans, car clubs, to reduce reliance on the car (Included as SM1)	Short	185
HM4	Install two Toucan crossings along White Way	Short	192
HM7	Introduce horizontal traffic calming (pinch points) along Rectory Lane	Short	201
HM9	Carry out further surveys to determine the effect of traffic which appears to re-route along Church Lane to avoid the High Street	Short	209
HM11	Introduce ramp metering on junction 8 of the A1(M)	Short	212
HM18	Implement and achieve the parking policies and ambitions contained in the Parking Strategy (2004)	Short	216
HM29	Make it left turn only out of Mobbsbury Road on to Fairlands Way	Short	224
HM2	Reduce the need to travel through good land use planning	Medium	238
HM8	Increase the throughput of major roundabouts by using either grade separation or filter lanes	Medium	241
HM31	Ban right turn in to Sainsbury's from the north, and force traffic to do U-turn at Corey's Mill Lane.	Medium	255
HM3	Improve the East-West transport links to the north of Stevenage	Long	258
HM13	Build a link road parallel to the A1(M) to access Stevenage West	Long	259
HM17	Widening of the A1(M), including continued discussion with stakeholders	Long	266
HM21	Address the Stevenage gyratory system including the removal of traffic from James Way	Long	280
HM32	Address operational issues at A1(M) Junction 8	Long	289

Highway schemes not included in the UTP;

Scheme Reference	Scheme Name	Timescale	Page Number
HM6	Introduce 20mph Zones around schools and residential areas	Short	197
HM28	Widen Mobbsbury Way on Approach to Fairlands Way	Short	221
HM5	Introduce traffic calming measures along Valley Way to reduce speeds	Medium	239
HM12	Introduce variable speed limits	Medium	248
HM14	Alter signs to discourage through traffic and work with satellite navigation companies	Medium	249
HM15	Introduce peak time traffic lights at town centre roundabouts	Medium	252
HM30	Convert Mobbsbury Way/ Fairlands Way junction to a roundabout	Medium	253
HM16	Variable speed limits on the A1(M)	Long	264
HM19	High Occupancy Vehicle (HOV) (car pool/taxi/bus) lane on the A1(M)	Long	278
HM20	Divert the A1(M)	Long	279
PCM4	Introduce peak hour signals at the junction of Aston Lane/ A602 Broadhall Way	Short	227
PCM18	Open Hertford Road	Short	230
PCM17	Make Gresley Way part of the ring road	Medium	229

PCM19	Provide a second access from Cavendish Road industrial area to Meadway	Medium	235

Note: PCM represents a scheme identified at Public Consultation

Scheme Name	Introduce a package of smarter measures such as travel marketing, travel plans, car clubs, to reduce reliance on the car	
Scheme Reference:	HM1	
Problem References:	S7 S6	Lack of travel marketing to homes and business Lack of business travel plans in Stevenage
Scheme Status:	This scheme is addressed through other specific UTP schemes (Included as SM1)	

Description of Proposal

Smarter choices are techniques for influencing people's travel behaviour towards more sustainable options such as encouraging school, workplace and individualised travel planning. They also seek to improve public transport and marketing services such as travel awareness campaigns, setting up websites for car share schemes, supporting car clubs and encouraging teleworking. The proposed implementation of Smarter Choices Measures can therefore be better defined as a series of discrete options all working together to try and reduce the reliance on the car and encourage people to travel in a more sustainable way.

The individual measures that are being proposed as part of the package of Smarter Measures are described in more detail in the individual Scheme Descriptions. These include:

SM1 - Improve publicity of sustainable transport options through Marketing Campaign
SM2 - Promote awareness of opportunities for sustainable travel - Personalised Travel Planning
SM6 - Increase the use of work travel plans
SM7 - Introduce car sharing and car club schemes
SM10 - Produce a walking strategy for Stevenage

There are a number of guidance documents that have been developed by the DfT to support those who want to set up a Smarter Choices campaign. One of the most relevant at this stage of the scheme development would be 'Making Campaigning for Smarter Choices Work – Guideline for Local Authorities, May 2005', which presents give guidance on the most appropriate way to set these schemes up to ensure that they are successful. A link to this document is given below.
Source : DfT

The effect of implementing sustainable travel measures has been tested within the traffic model. The implementation of sustainable measures is anticipated to reduce the traffic demand across the network by between 1.5% and 2.6% in the various future years. As a result of the sustainable measures the overall network performance is improved with an increase in average speed and a reduction in delays across the peak periods, **Table 1.1** and **1.2**.

Table 1.1 - Impacts of Sustainable Measures in the AM Peak

Network Statistics	2014 DM	2014 DS	2021 DM	2021 DS	2031 DM	2031 DS
Total number of trips (pcus)	-857.7	-1009.2	-909.3	-1330	-891.5	-1373.55
Percentage change in trip demand (%)	-1.76	-2.03	-1.75	-2.35	-1.68	-2.32
Total Time spent on the road (pcu/hr)	-536	-473.7	-473.4	-520.2	-418.4	-562.2
Total distance travelled (pcu/km)	-6300.2	-6876.6	-6731.7	-8106.3	-6611.1	-8466.1
Average Speed (kph)	1.5	1.4	0.6	0.7	0.5	0.7
Total delay per vehicle (mins/veh)	-0.43	-0.34	-0.27	-0.24	-0.22	-0.27
Total delay based on distance travelled (min/veh.km)	-0.07	-0.05	-0.04	0.00	-0.03	-0.04
Average trip length in model (km)	-0.02	-0.02	-0.02	0.00	-0.02	-0.01

Table 1.2 - Impacts of Sustainable Measures in the PM Peak

Network Statistics	2014 DM	2014 DS	2021 DM	2021 DS	2031 DM	2031 DS
Total Number of trips (pcus)	-815.4	-1064.6	-840.8	-1481.6	-853.1	-1666.5
Percentage change in trip demand (%)	-1.67	-2.10	-1.60	-2.50	-1.54	-2.62
Total time spent on the road (pcu/hr)	-356.6	-396.1	-399.2	-570.3	-617.5	-1394
Total distance travelled (pcu/km)	-5784.1	-5977.8	-5955.6	-7370.8	-6488.3	-9484.4
Average Speed (kph)	1	1.2	0.1	0.3	0.3	1
Total delay per vehicle (mins/veh)	-0.23	-0.25	-0.16	-0.20	-0.34	-0.88
Total delay based on distance travelled (min/veh.km)	-0.04	-0.05	-0.02	-0.01	-0.05	-0.18
Average trip length in model (km)	-0.04	-0.02	-0.04	-0.01	-0.04	-0.03

The sustainable measures traffic demand was tested against the demand without sustainable measures, using the same network which included the proposed infrastructure improvements.

Despite the reduction in demand, all the infrastructure improvements proposed are still required. The impact of the reduced demand is to relive the congestion in the network. Without the improvements, the impact of implementing sustainable measures would be negligible. With the proposed infrastructure and the sustainable measures in place, congestion at junctions is reduced, particularity in the local residential areas. By implementing sustainable measures, several junctions within the local network will be able to cope for a longer period of time before remediation work is required. The changes in flows as a result of implementing sustainable measures are shown in **Figure 1.1**, **1.2, 1.3** and **1.4** below;

Figure 1.1 - Change in Traffic Flow 2021 Do Something AM Peak
Blue is a reduction in flow with Sustainable Measures

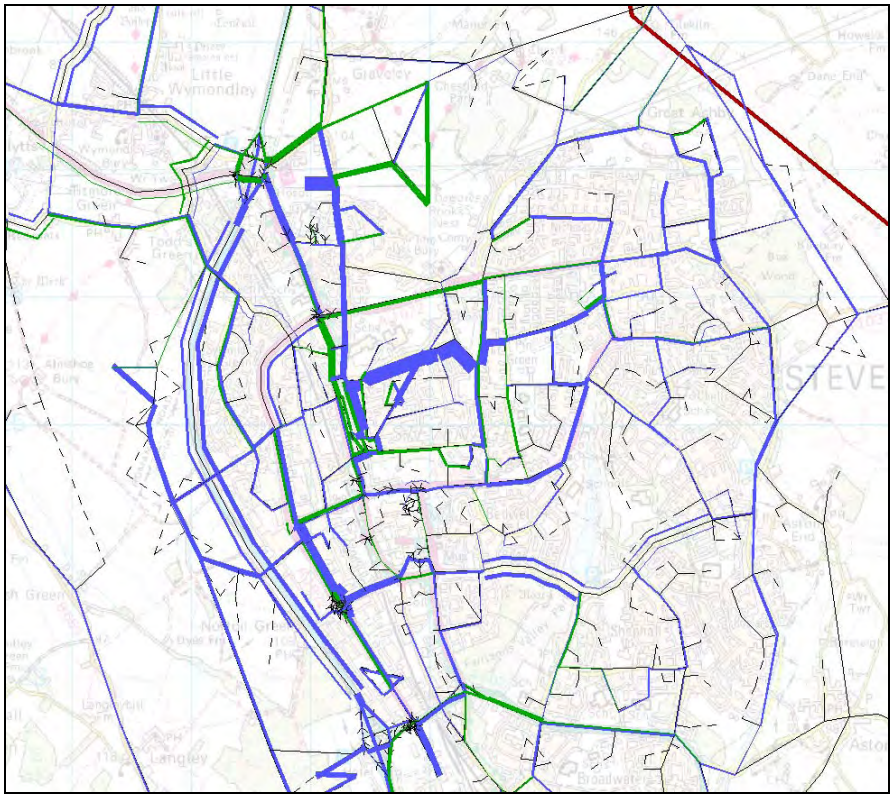


Figure 1.2 - Change in Traffic Flow 2021 Do Something PM Peak
Blue is a reduction in flow with Sustainable Measures

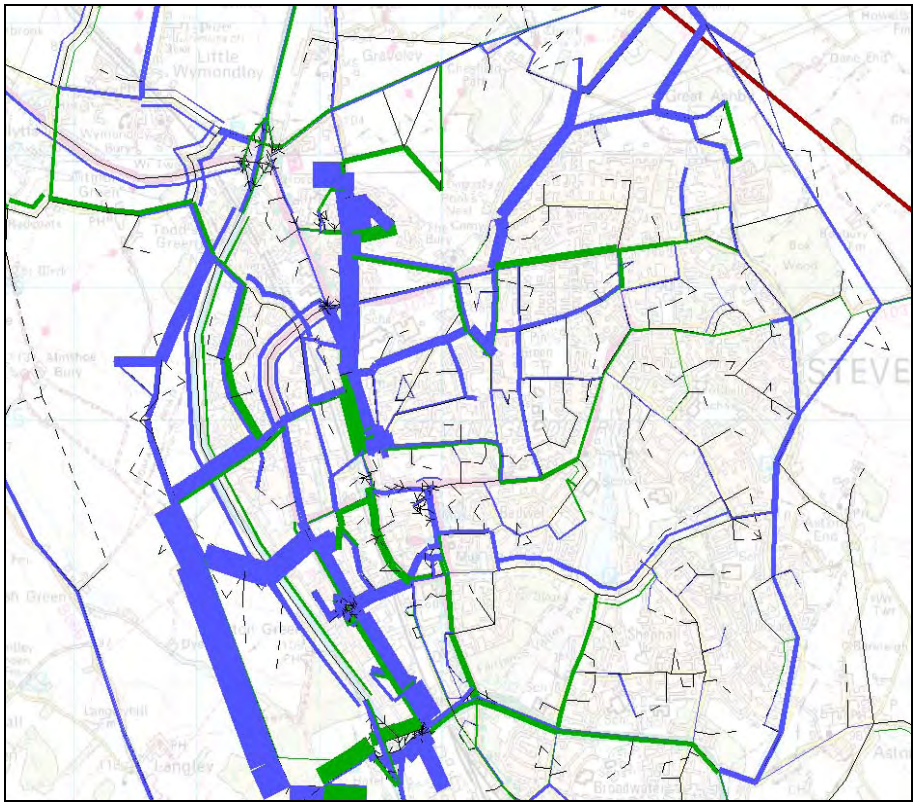


Figure 1.3 - 2031 Do Something AM Peak without Sustainable Measures – Delay and Volume over Capacity roads

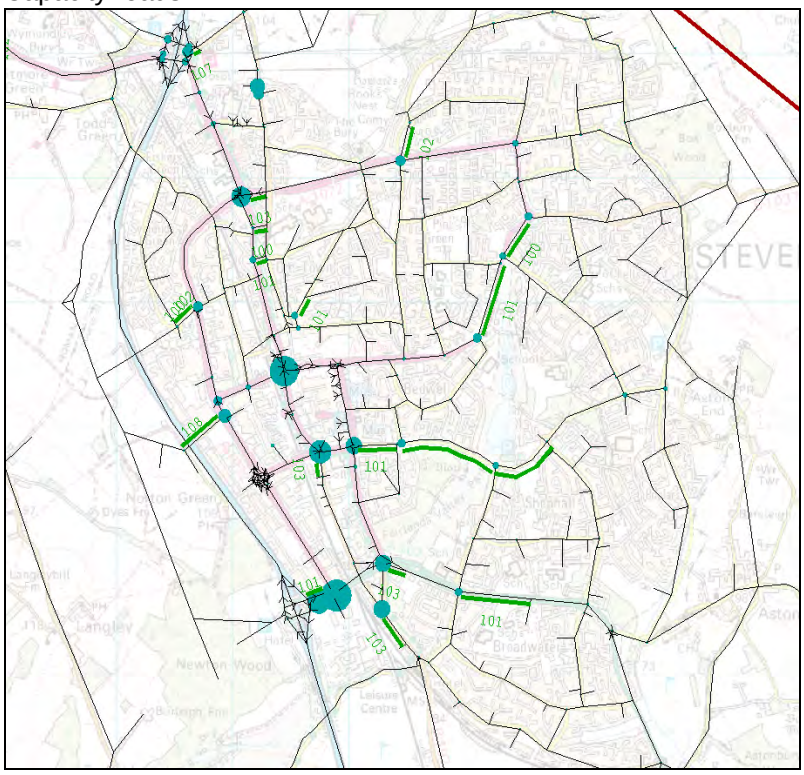
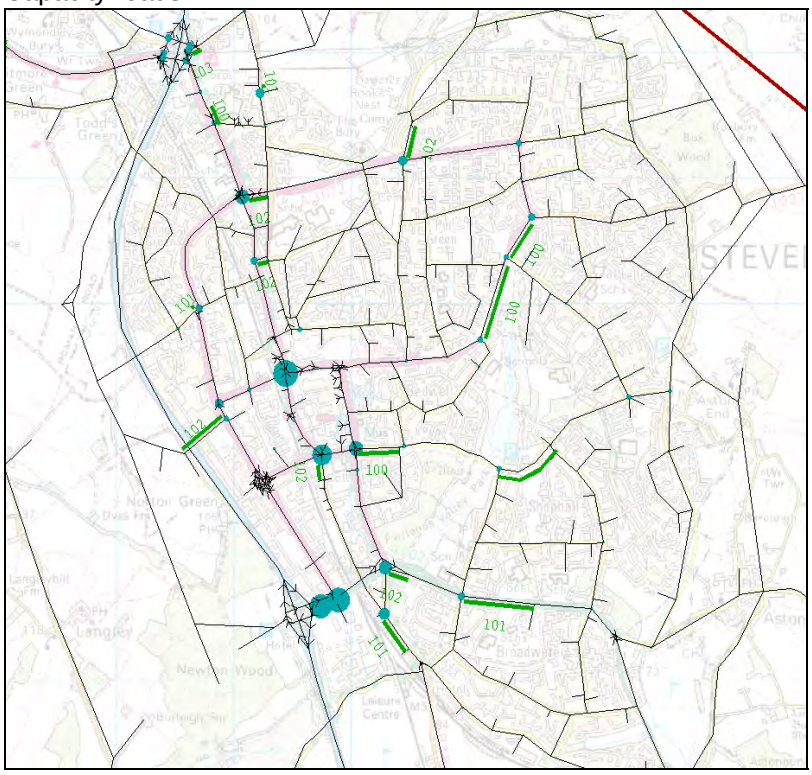


Figure 1.4 - 2031 Do Something AM Peak with Sustainable Measures– Delay and Volume over Capacity roads



Trip Reductions
A summary of the trip reductions that could be expected from various sustainable transport measures and how these have been applied in the traffic model is shown in **Table 1.3** below;

Table 1.3 Trip Reductions in Stevenage

Assumptions Summary	User Group	Reduction	Reduction Type	Matrix Effected	Time Periods	Scenario
School Travel Plans	HBE	8% New/Relocated 3% Existing	Site Specific – Destin AM Origin PM	Development Matrix	AM, IP	DM
Residential Plans	HBW,HBO	10%	Zone Specific SNAP zones Freeze on Work Place TP zones	Development Matrix	All	DM/DS
Work Place Travel Plans	HBW, EB	18% HWB & 5% EB for new businesses 10% HBW & 2% EB for existing businesses	Key Zone Specific Gunnels Wood Pin Green SNAP Destin AM, Origin PM	Development Matrix	AM, PM	DM/DS
Car Sharing	HBW, HBO, NHBO	No Reduction	N/A	N/A	N/A	N/A
Individual Travel Marketing (ITM)	HBW, HBO, NHBO	7%	Town Centre based trips Freeze on SNAP zones	Final Matrix	All	DM/DS

User Groups
HBW – *Home Based Work*
HBO – *Home Based Other*
NHBO – *Non Home Based Other*

The full trip reduction will be made to the future year matrix impacted by each new development. This is because travel plan guidance advocates that once people have a particular travel pattern they don't tend to change it.

Reductions for existing businesses and schools will be made to the first design year of 2014 and do minimum scenario assuming no further reductions over time.

Impact of Travel Demand Management Schemes
The impact the travel demand management schemes have had on the total demand in the traffic model is given in **Tables 1.4, 1.5** and **1.6** below. On average the reduction achieved through sustainable travel measures is 2%.

Table 1.4 2014 Total Demand

Future Year 2014	AM	IP	PM
Pre Sustainable Travel 2014 DM	47,047	30,824	47,429
Post Sustainable Travel 2014 DM	46,174	30,518	46,601
Difference (Trips)	*873*	*306*	*827*
Difference (%)	*98*	*99*	*98*
Pre Sustainable Travel 2014 DS	48,247	32,598	49,278
Post Sustainable Travel 2014 DS	47,220	32,075	48,195
Difference (Trips)	*1,028*	*523*	*1,083*
Difference (%)	*98*	*98*	*98*

Table 1.5 2021 Total Demand

Future Year 2021	AM	IP	PM
Pre Sustainable Travel 2021 DM	50,683	32,854	51,233
Post Sustainable Travel 2021 DM	49,767	32,573	50,391
Difference (Trips)	*916*	*281*	*842*
Difference (%)	*98*	*99*	*98*
Pre Sustainable Travel 2021 DS	55,608	37,920	58,183
Post Sustainable Travel 2021 DS	54,234	37,280	56,658
Difference (Trips)	*1,374*	*640*	*1,525*
Difference (%)	*98*	*98*	*97*

Table 1.6 2031 Total Demand

Future Year 2031	AM	IP	PM
Pre Sustainable Travel 2031 DM	51,400	33,784	53,700
Post Sustainable Travel 2031 DM	50,502	33,505	52,845
Difference (Trips)	*898*	*279*	*855*
Difference (%)	*98*	*99*	*98*
Pre Sustainable Travel 2031 DS	57,968	39,856	62,551
Post Sustainable Travel 2031 DS	56,558	39,196	60,854
Difference (Trips)	*1,410*	*659*	*1,697*
Difference (%)	*98*	*98*	*97*

Location Plan/outline Scheme Plan
Individual measures delivered as part of this package of Smarter Measures are dealt with by individual schemes.
Supporting Photograph(s)

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Dealt with at individual scheme level		

Links to other UTP schemes:	SM1 - Improve publicity of sustainable transport options through Marketing Campaign

	SM2 - Promote awareness of opportunities for sustainable travel - Personalised Travel Planning SM6 - Increase the use of work travel plans SM7 - Introduce car sharing and car club schemes SM10 - Produce a walking strategy for Stevenage

Contribution to Objectives / Indicators:	UTP Objectives	1) Increase the pedestrian priority and environment along key desire lines. 2) Improve the connectivity and continuity of the cycle network. 4) Increase the amount and quality of public transport information available in Stevenage 8) Increase the number of sustainable travel measures and their uptake
	LTP Indicators	• Cycling Trips • Passenger transport information, User satisfaction • Public transport patronage

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
TOTAL COST FOR DELIVERY		

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	N/A	
Can the scheme be delivered without third party involvement?	~~Y~~	N
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk: There would need to be some involvement between transport operators, existing LA sustainable officers and businesses within the area. This does however not create a significant barrier to this being delivered but will need to be managed effectively		
Other Information/Additional Notes:		

Scheme Name	Install two Toucan crossings along White Way	
Scheme Reference:	HM4	
Problem References:	H2.1	Excessive speeds along White Way and lack of crossing facilities
	W2	Gaps/breaks in the pedestrian network restrict movement
	W3	Lack of suitable crossing facilities across the network
	W6	Lack of provision for vulnerable road users/ mobility impaired
Scheme Status:	This scheme is included in the UTP	

Description of Proposals

It was raised as part of the consultation process that White Way often experiences excessive speeds and there is also a lack of crossing facilities. The route currently links Fairlands Way and Gresley Way to the east of the town. The route is currently designated a 30mph speed limit and given that the houses along the route have parking spaces means that there are rarely any obstructions for vehicles travelling along this route. Although no speed data is currently available for this route the concern raised by local residents through their elected Member means that this issue would need to be addressed through the UTP. There are also currently no crossing facilities along White Way and the speeding issues that have been identified that the route is it difficult for pedestrians to cross.

The options that had been developed for White Way looked at significant interventions which may restrict access in the area to address the problems down to 'lighter touch' approaches with the aim of changing driver's perceptions of the route. Therefore the first option that was investigated was looking at closing this route to through traffic. This would involve some significant physical intervention to stop people travelling along the length of the route. This would potentially cause a number of problems for the residents who live along the large number of residential cul-de-sacs that adjoin White Way and would mean some long diversions to gain access. This option was run through the traffic model to determine the local impacts of re-routing as a result of banning through trips. The impact of this in the model demonstrated that as the route was closed to through traffic the volume of trips increased along the Fairlands Way/ Gresley Way route. No additional congestion problems were created but it was observed in the traffic model that trips attempting to access routes off of White Way had to divert around Gresley Way and Fairlands Way. Given the level of intervention that would be required to close the route to through traffic and the restrictions on access for local residents it was not considered an appropriate measure to take forward

A further tool available to reduce the level of rat running through this residential area is to increase the journey time along this route and therefore make it less attractive. However, to implement a 20mph limit or zone along this route there may need to be some justification in terms of an ability to reduce the number accidents. Given that there is not an identified accident problem along this route it may be difficult to justify this scheme against the safety LTP indicators. However alternative traffic calming may need to be considered as a scheme as other benefits could be identified which would improve accessibility as the scheme scored 11 in the scheme assessment framework, with most of the points being attributed to accessibility indicators.

If the scheme is pursued on the basis that speeding is a perceived problem along this route it may be necessary to undertake some speed assessments to determine observed speeds. If it is established that speeding is a problem along this route then it may be appropriate to implement some variable matrix signs that inform drivers that they are exceeding the speed limit. Whilst it may not be appropriate to implement full vertical or horizontal traffic calming the introduction of pedestrian crossings along the route should help to reduce speeds physically by the signals being called by pedestrians but also through a driver perception that this is a pedestrian environment. This would also accord well with the road user hierarchy in that pedestrians are being considered first with access to the bus services being improved with the additional benefits that will connect the historic

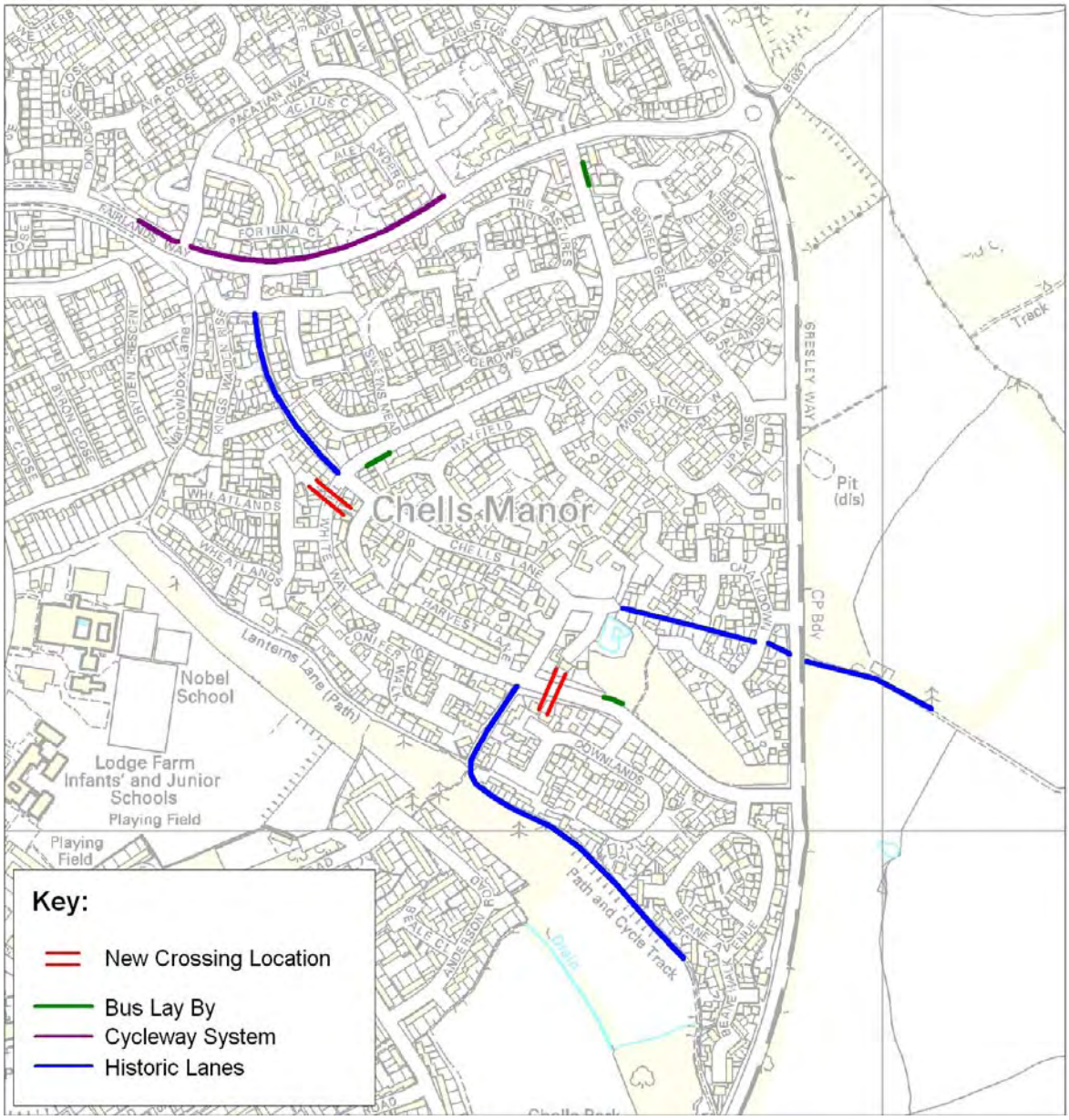
cycle lanes that cross White Way.

It is therefore considered that the most appropriate scheme to address the problems that have been identified would be the introduction of crossing facilities along this route. This would provide some much needed linkages across the route but also act as a means of traffic calming through physical restrictions, from the signals being called, but also a change in perceptions of the route in that it would be viewed more as a pedestrian environment. Review of the route has shown that there are a number of bus stops along the route where if a crossing was provided in the vicinity would significantly improve access. In addition to this there are also a number historic cycle routes that link in to White Way but don't currently have any means of connection across White Way. It is proposed that 2 Toucan Crossings are installed along the route to provide a safe means of crossing the road at locations where desire lines are considered to be strongest. The location of these crossings is close to existing bus stops and also would mean that the historic cycle routes from the east, west and south. These locations of these are shown in the diagram below.

A **toucan crossing** is a type of pedestrian crossing that also allows bicycles to be ridden across. Toucan crossings are normally 4 metres (13 feet) wide, instead of the 2.8 metre (9 feet) width of a pelican crossing or puffin crossing. A "green bicycle" is displayed next to the "green man" when cyclists and pedestrians are permitted to cross. As well as this, it is different from a pelican crossing because, before the lights for vehicles go back to green, a steady red and amber are displayed instead of the flashing amber seen on pelican crossings. The pedestrian/cyclist signal lights may be on the near side of the crossing (like a puffin crossing), or on the opposite side of the road (like a pelican crossing).

The scheme has been tested in the transport model. It is assumed that it will form part of the 2014 Do Minimum scenario and is therefore considered to be included in all future year scenarios. This assumed that the signals would get called for 22 seconds every 5 minutes in all time periods. The implementation of this scheme did not have a detrimental impact on highway operation.

Location Plan/outline Scheme Plan



Supporting Photograph(s)

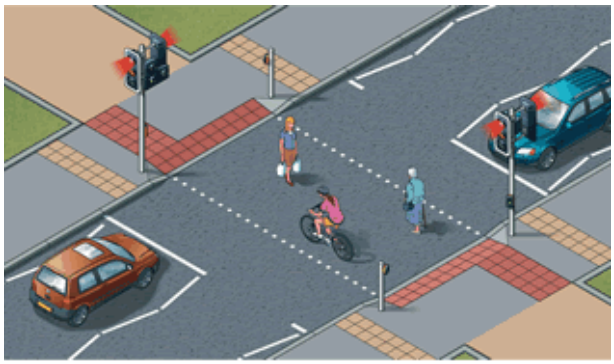


Illustration of the Toucan Crossing
(*www.direct.gov.uk*)

Example of Toucan Crossing in operation

Example of Pedestrian Cycle Facilities,
Toucan crossing - Traffic Signal Heads

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Location of appropriate underground services to operate signals	Revise location of signal crossings	Y
Location of crossings in reference to safety requirements for approach visibility on this type of road	Revise location of signal crossings	Y
Speeds on approach to crossing points	The installation of traffic signals on the route should influence driver behaviour. High friction surfacing can also be installed on the approach to the stop	Y

	lines.	
Links to other UTP schemes:	None	

Contribution to Objectives / Indicators:	UTP Objectives	3) Increase the pedestrian priority and environment along key desire lines. 4) Improve the connectivity and continuity of the cycle network. 6) Address severance issues caused by the road and rail infrastructure. 7) Reduce rat running and excessive vehicle speeds across the highway network.
	LTP Indicators	• Cycling Trips

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
Toucan Crossing (x2)	£100,000	
Detailed design costs	£20,000	
Supervision costs	£10,000	
Miscellaneous costs (inflation, contingencies, etc)	£70,000	
TOTAL COST FOR DELIVERY	£200,000	

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	Y	~~N~~
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk:		

Other Information/Additional Notes:

Scheme Name	Introduce 20mph Zones around schools and residential areas	
Scheme Reference:	HM6	
Problem References:	H1 H2 H5	Rat running through Stevenage Excessive speeds in parts of Stevenage Traffic volumes and speeds deter cyclists
Scheme Status:	This scheme is not included in the UTP	

Description of Proposals

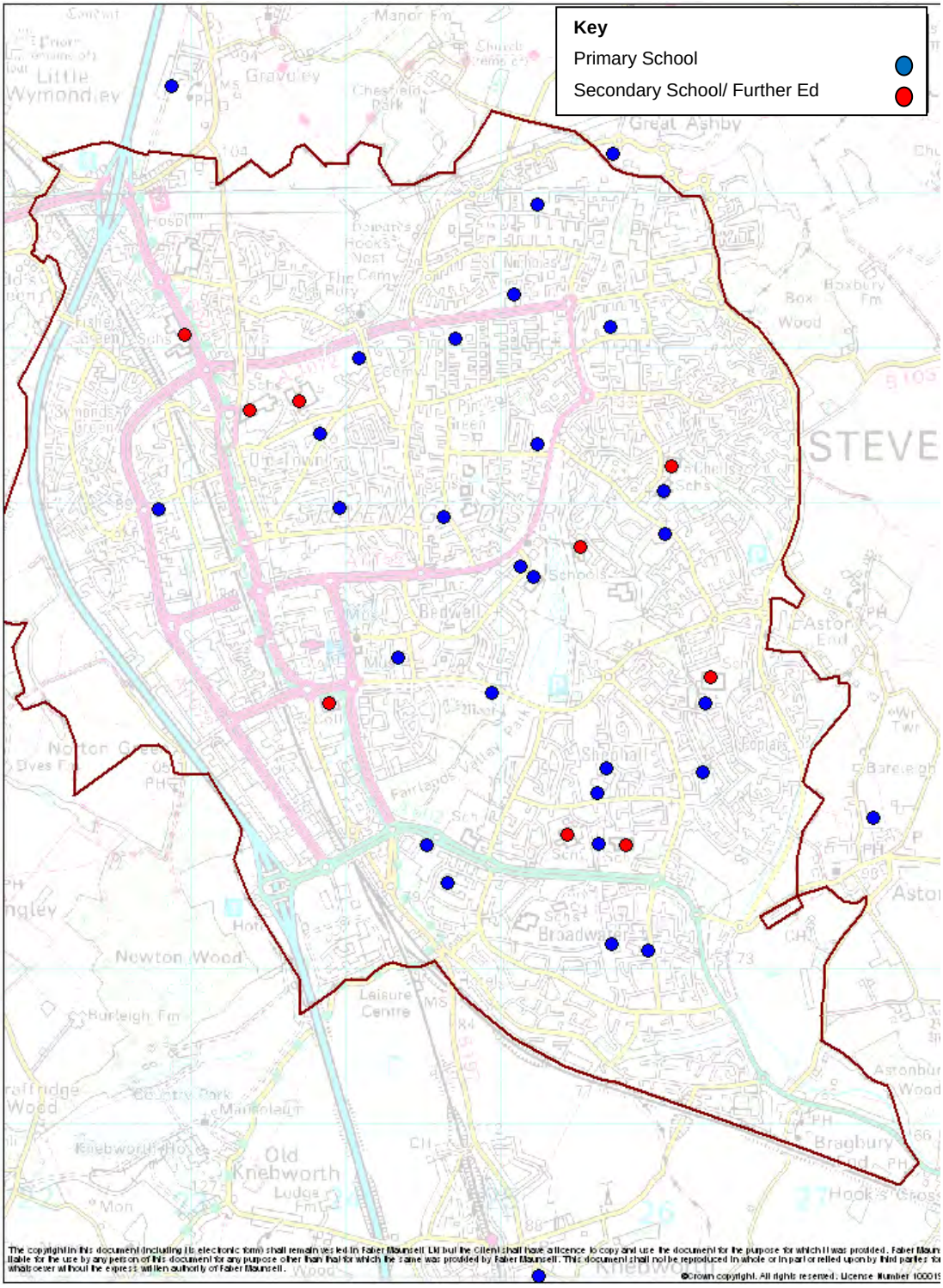
The issue of excessive vehicle speeds in Stevenage, both within residential areas and around schools, has been raised on numerous occasions during the preparation of the UTP. One solution to address this issue is to implement 20mph zones in selected locations. In essence, a 20mph Zone is a street along which speed reduction measures have been introduced to ensure a self enforcing speed limit of 20mph can be applied. They include gateway signs at the entrances and exits and it is intended that no point in the road should be more than 50 metres from a traffic calming feature. Traffic calming measures used within the zone (e.g. road humps, raised junctions and mini roundabouts) can vary in combination and are dependent on a number of local factors such as road type and traffic flows.

20mph zones are generally considered where excessive speeds occur, and where traffic calming measures would be needed to achieve compliance with the speed limit. They are particularly appropriate where there is an existing record of accidents or where concentrations of pedestrians and/or cyclists are anticipated, such as outside of schools. Department for Transport guidance on 20mph zones emphasizes their accident reduction potential but also states that they 'can help to protect children walking and cycling to and from school and may encourage other children to walk or cycle'.

The process for selecting an appropriate area for treatment and the procedures for implementing a 20mph zone can vary between Local Authorities; however there are a number of statutory procedures to be followed. The scheme area identified for the implementation of a 20mph limit is generally determined by the Local Highway Authority, who also requires a range of information including speed surveys, traffic flows and collision data.

Taking the above points into consideration it is recognised that this scheme would be subject to the Speed Management Strategy with specific measures at schools being investigated through the Safer Routes to School programme. As such it is not proposed to take this scheme forward through the UTP.

Location Plan/outline Scheme Plan



Supporting Photograph(s)

20mph zone entry sign

Vertical traffic calming measures

Horizontal traffic calming measures

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Is there sufficient space to accommodate physical traffic calming measures?	The area(s) selected will need to be suitable for treatment with physical traffic calming measures	Y
Is the speed profile of the road(s) suitable to implement a 20mph zone	Each proposed area will have to be assessed individually to determine the appropriateness of implementing a 20mph speed limit	Y

Links to other UTP schemes:	HM5- Introduce traffic calming measures along Valley Way to reduce speeds HM7- Close Rectory Lane to through Traffic or introduce traffic calming measures

Contribution to Objectives / Indicators:	UTP Objectives	1) Increase the pedestrian priority and environment along key desire lines 7) Reduce rat running and excessive vehicle speeds across the highway network
	LTP Indicators	• Cycling Trips

Outline Cost Analysis (estimated study costs at this stage)		
Works Element	**Est. Cost**	**Notes**
No specific cost has been attributed to this scheme		
TOTAL COST FOR DELIVERY		

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	~~Y~~	N
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	~~Y~~	N
Where 'N' details for overcoming deliverability risk: Implementing a 20mph speed limit requires a number of statutory procedures including a formal consultation process through to detailed design. This process will require the input of third parties and may therefore not be feasible to implement in the short term.		

Other Information/Additional Notes:

Scheme Name	Introduce horizontal traffic calming (pinch points) along Rectory Lane	
Scheme Reference:	HM7	
Problem References:	H1 H1.2 H2	Rat Running through Stevenage Rectory Lane and the B197 being used as a rat run Excessive vehicle speeds in parts of Stevenage
Scheme Status:	This scheme is included in the UTP	

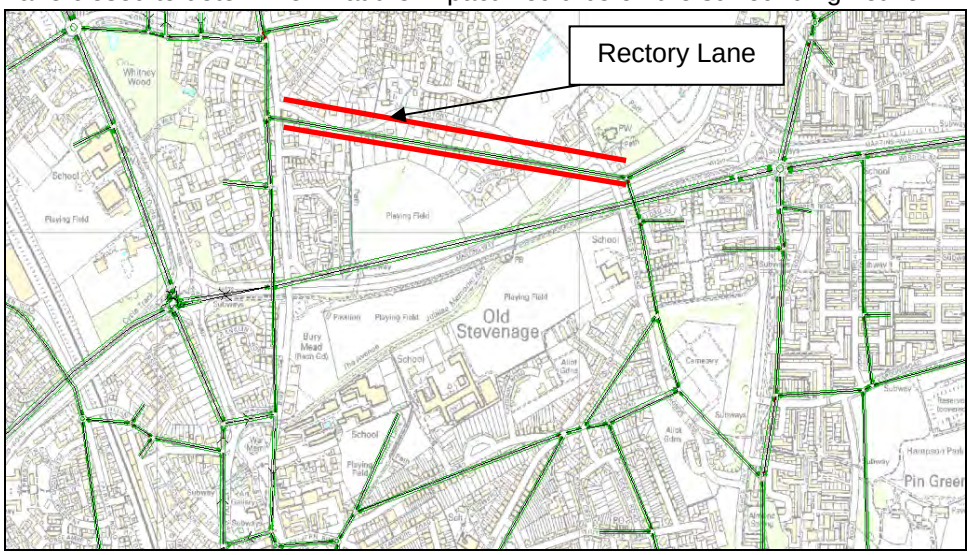
Description of Proposals

There is a long history to this problem of rat running and road safety along this route. A number of options have already been considered by Hertfordshire Highways relating to experimental closures along this route to try and mitigate the issues. This was only done on an experimental basis so that information could be gathered on its impact. Whilst closure of the route may prevent the rat running it could also significantly restrict access to the area and the significant points of interest, including schools and churches, which also need to be considered. The previous experimental closure of this route did not show any material benefits in accident reduction, primarily because the number of accidents along the route was relatively low in the first place and also split public opinion on closure of the route, largely with residents of Rectory Lane in favour and others in surrounding areas against the proposal. The outcome of this experimental closure is summarised in a report presented to the Stevenage Highways Joint Member Panel on Tuesday 15th July 2003 (Agenda item 1). This suggests that the panel should support the removal of the experimental closure and introduce some signing and lining improvements along the route at the pedestrian crossing points and introduce traffic calming outside Almond Hill School.

On this basis as part of the UTP the closure of Rectory Lane has been tested to determine the impact it would have on surrounding routes and other scheme have also been considered to address the speeding and accident problems along the route.

Location Plan and Testing of Options

The location of Rectory Lane in Stevenage is shown in the diagram below. The traffic model represents the road network within Stevenage at a relatively strategic level and can therefore provide an indication of the impact of some of the UTP schemes. Whilst the model includes Rectory Lane it does not include the link through to St Albans Drive as it was not possible to include all the residential routes within the urban area. A test was undertaken in the traffic model assignment with Rectory Lane closed to determine what the impact would be on the surrounding network in the base year.



Impact of Closing Rectory Lane – Morning Peak

The impact of closing Rectory Lane in the morning peak shows that closing the road has a small detrimental impact on the overall performance of the network with a reduction in average speed. Although these numbers only appear to be small this is taking account of movements right the way across the networks of Stevenage and Hitchin so indicates quite a significant change.

Morning Peak Network Statistics

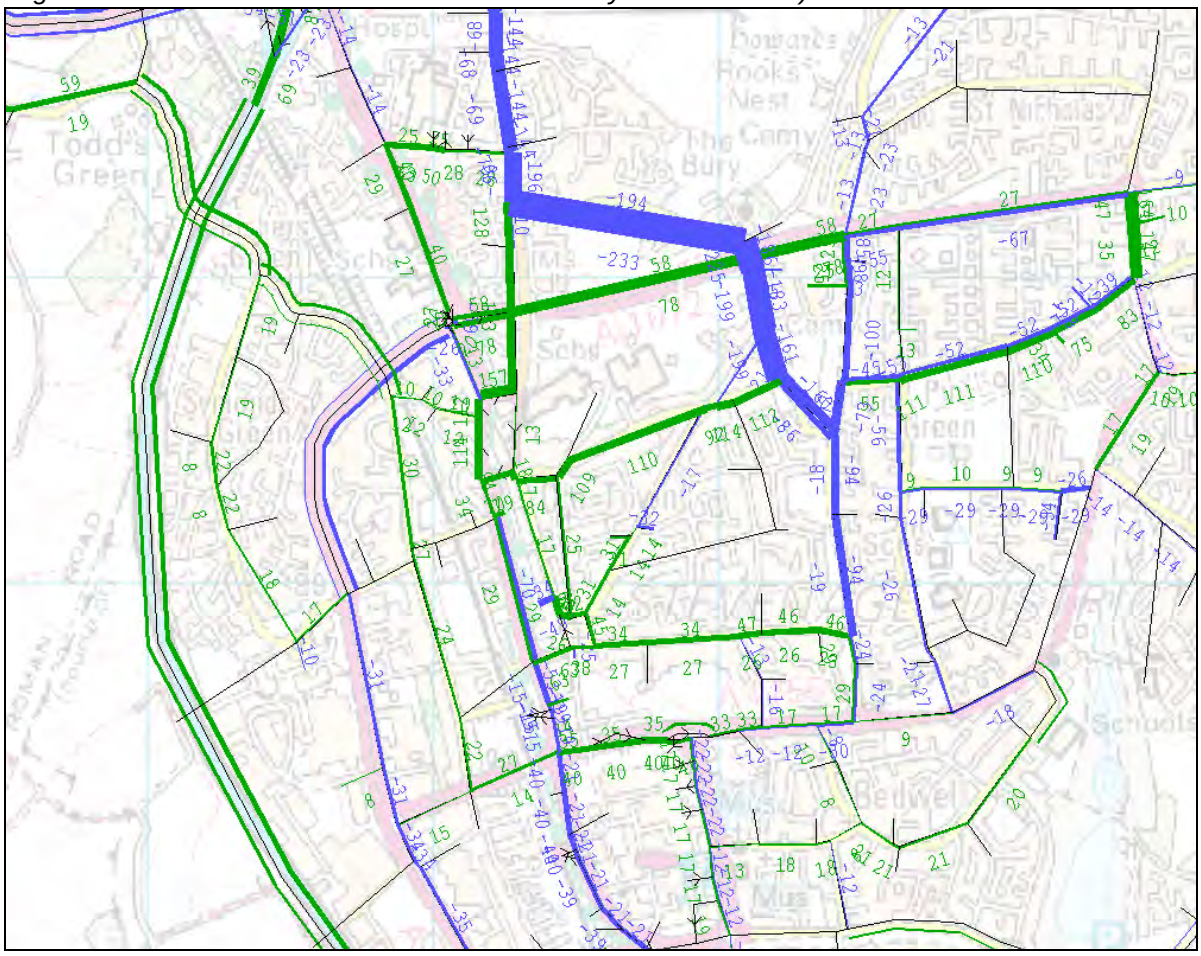
Parameter	Base	HM7	% Difference
Total Travel Time (pcu-hr)	8367.3	8384.1	+ 0.20
Travel Distance (pcu-km)	418582.7	419060.7	+ 0.11
Average Speed (kph)	50.03	49.98	- 0.10

The impact in the local vicinity is a re-routing of trips onto:

- Martins Way;
- Walkern Road;
- Sish Lane; and
- Fairlands Way.

There is an increase in trips in the urban area of Stevenage around the gyratory and along the High Street. There is a reduction of approximately 140 pcus travelling south along North Road with a subsequent increase on Hitchin Road.

Difference in Flow between the Base Year Model and HM7 (Rectory Lane closed) in the AM Peak (A negative number is a reduction in flow when Rectory Lane is closed)



This re-routing of traffic increases demand on certain roads so that they operate over capacity as a result of the road closure, this is particular evident on Hitchin Road Southbound (approach to Martins Way roundabout).

Impact of Closing Rectory Lane – Evening Peak

The impact on the overall network performance in the evening peak is similar to the morning peak with closing Rectory Lane having a detrimental effect,

Evening Peak Network Statistics

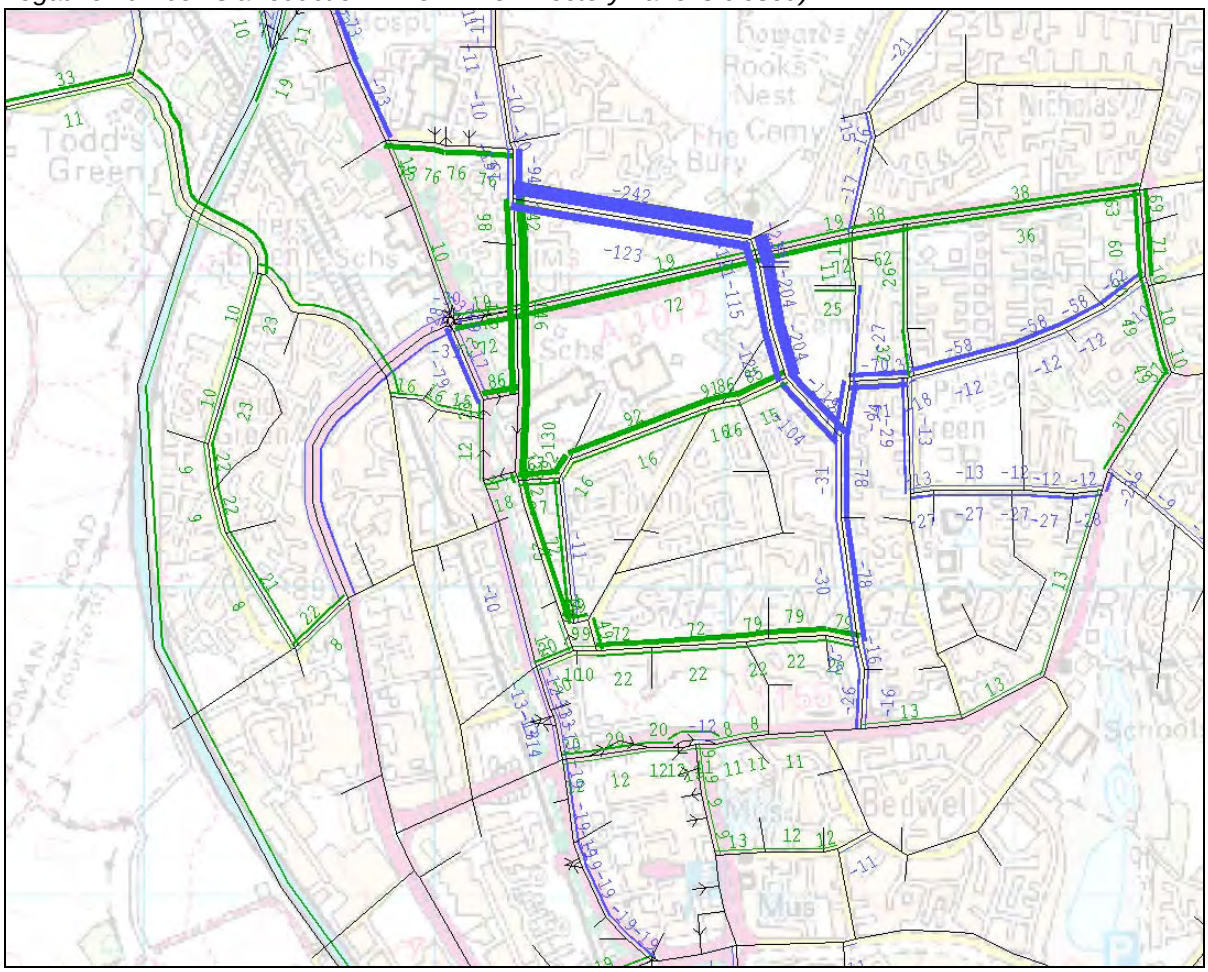
Parameter	Base	HM7	% Difference
Total Travel Time (pcu-hr)	7596.3	7606.2	+ 0.13
Travel Distance (pcu-km)	398876	398909.5	+ 0.01
Average Speed (kph)	52.51	52.45	- 0.12

It can be seen that as a result of closing Rectory Lane to through trips, traffic re-routes onto other roads within the local network. The impact in the evening peak is similar to the pattern of the morning peak, albeit more localised, with re-routing onto:

- Martins Way;
- Walkern Road;
- Sish Lane; and
- Fairlands Way.

This is shown graphically in the diagram below which represents the difference between the base year flows with and without Rectory Lane closed. A negative number means a reduction in trips following the road closure, with traffic clearly re-routing on to alternative routes in the area.

Difference in Flow between the Base Year Model and HM7 (Rectory Lane closed) in the PM Peak (A negative number is a reduction in flow when Rectory Lane is closed)



The re-routing of traffic increases demand on certain roads so that they operate over capacity in the evening peak as a result of closing Rectory Lane. This is particularly evident at:

- Hitchin Road Southbound (approach to Martins Way roundabout);
- Martins Way Eastbound (approach to Grace Way roundabout);

Summary

It can be seen that closing Rectory Lane to through traffic has a detrimental effect not only in the local vicinity but also on the wider network performance. Closure of the road causes traffic to re-route onto several other routes, including some residential areas and urban parts of Stevenage like Walkern Road and the High Street (**see diagrams above**). The re-routing of traffic causes additional pressure to the road network in the local vicinity with a couple of roads operating over capacity as a result of the road closure (Hitchin Road southbound and Martins Way eastbound).

It can be seen that closing Rectory Lane to through trips has a detrimental impact in the base year which is only likely to be exacerbated in future years as traffic demand increases. Therefore as a result of testing this option in the transport model it is recommended that Rectory Lane is not closed to through trips.

In order to address the safety issues along this route there is also a further alternative to introduce traffic calming along the route. There is already a 20mph advisory speed sign on the bend along the route to try and slow traffic but it would appear that this is not adhered to. An alternative scheme proposed within the UTP is seeking to assess the appropriateness and practicality of implementing 20mph zones outside schools within Stevenage (HM6) so the issues outside Almond Hill school will be addressed within this study.

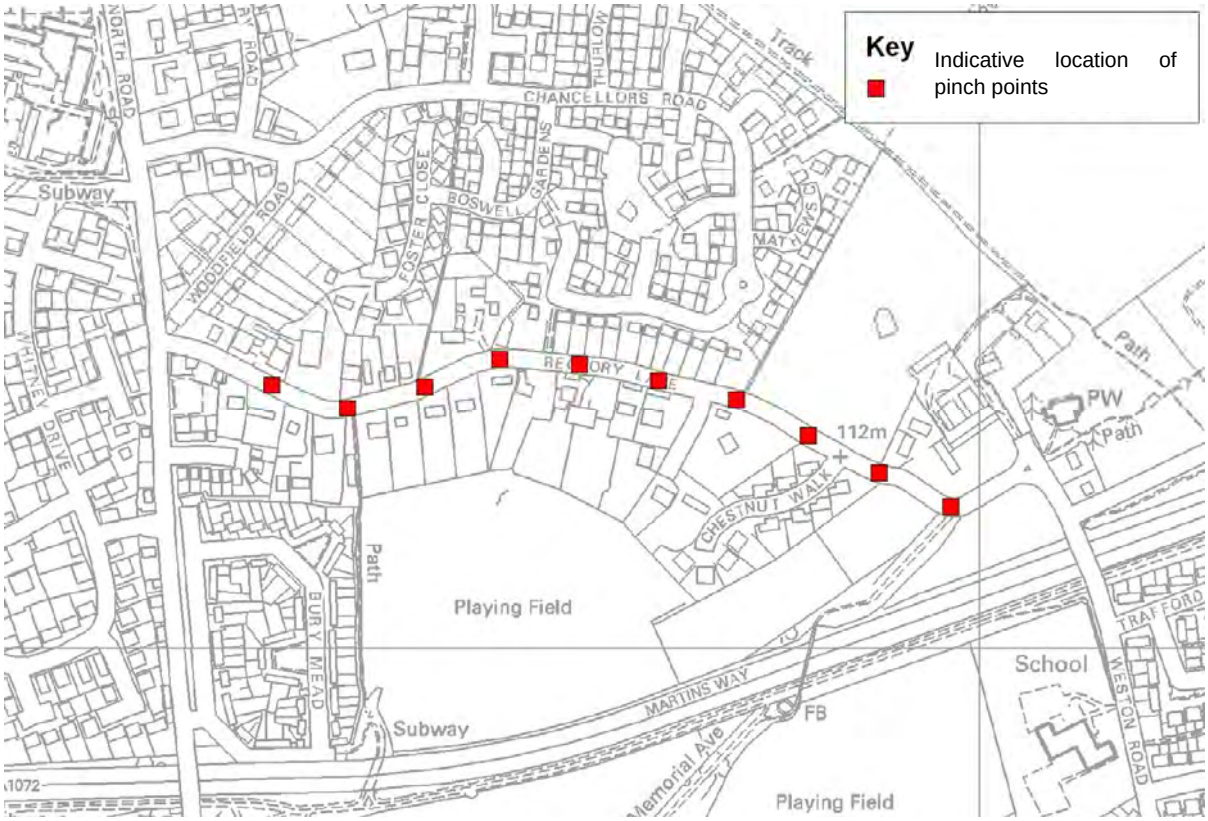
The traffic modelling that has been undertaken already assumes that Rectory Lane operates a 20mph speed limit on the route as this is what was observed during the site visits when the model base network was constructed to reflect the 20mph warning on the bend. It is therefore not possible to assess the impact of introducing physical speed reducing interventions within the model. However given the nature of the route it may be necessary to consider implementing some horizontal traffic calming to try and physically reduce the speeds on the route which could also have the effect of making the route less attractive and users choosing to use the primary network instead. In addition to this the UTP has made an assessment of all the junctions within the area surrounding Rectory Lane. Proposals have also been suggested at the a number of key junctions as part of HM8 which are likely to increase the capacity of a number of the primary routes around Stevenage in the vicinity of Rectory Lane which should make the primary routes more attractive.

It is proposed that pinch-points should be implemented along the length of Rectory Lane to reduce the vehicle speeds and conform to the 20mph speed limit. This measure involves kerb build-outs on opposite sides of the carriageway to narrow the carriageway to just allow two vehicles to pass or more commonly, to allow single vehicle flow only. As with chicanes, signing can give priority to one direction of flow or alternatively no signed priority relies on inducing driver caution to achieve the necessary speed reduction. In either situation, a pinch-point in isolation will only influence vehicle speeds in the immediate vicinity of the pinch-point. The narrowed carriageway assists crossing pedestrians and the speed reduction effect can be increased by raising the pinch-point on a road table. The potential location of the pinch-points has been outlined in the diagram overleaf. The location and number of pinch-points shown is only indicative. As part of the detailed design stage the number, location and style of the pinch points would be addressed in consultation with local residents and to be in keeping with the local characteristics of the area.

The main intention of this scheme is to reduce speeds through a narrowing of the carriageway in an attempt to try to both physically slow traffic down, if opposing traffic is coming towards them but also change drivers perception of the route. This could also be achieved through other means, such as providing a widened footpath or additional crossing locations, but it is recommended that pinch-points are introduced.

Following the public consultation exercise there were a number of additional issues that were raised by residents of Rectory Lane, namely a perceived lack of crossing points along the lane and problems with maintenance on the footway and carriageway. It is considered necessary to include these comments within the scheme description for the purposes of completeness and it is recommended that they be addressed through the detailed design stage associated with implementing this scheme.

Location Plan/outline Scheme Plan



Supporting Photograph(s)

Example of pinch point

Example of pinch point

Example of pinch-point in Shephall Way

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Consultation with local residents on proposed implementation of chicanes	Consult with local residents	Y
Consultation with emergency services to determine issues	Consult with emergency services	Y
Location of chicanes needs to be revised following detailed design	Revise locations	Y

Links to other UTP schemes:	HM6 - Introduce 20mph zones around schools and residential areas. HM8 - Increase the throughput of major roundabouts by using either grade separation or filter lanes

Contribution to Objectives / Indicators:	UTP Objectives	5) Increase the pedestrian priority and environment along key desire lines. 6) Improve the connectivity and continuity of the cycle network. 8) Address severance issues caused by the road and rail infrastructure. 9) Reduce rat running and excessive vehicle speeds across the highway network.
	LTP Indicators	• Cycling Trips

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
Cost of pinch points implemented at 10 sites	£50,000	Average cost of single pinch point is assumed to be £5,000.

TOTAL COST FOR DELIVERY	£50,000	

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	Y	~~N~~
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk:		

Other Information/Additional Notes:

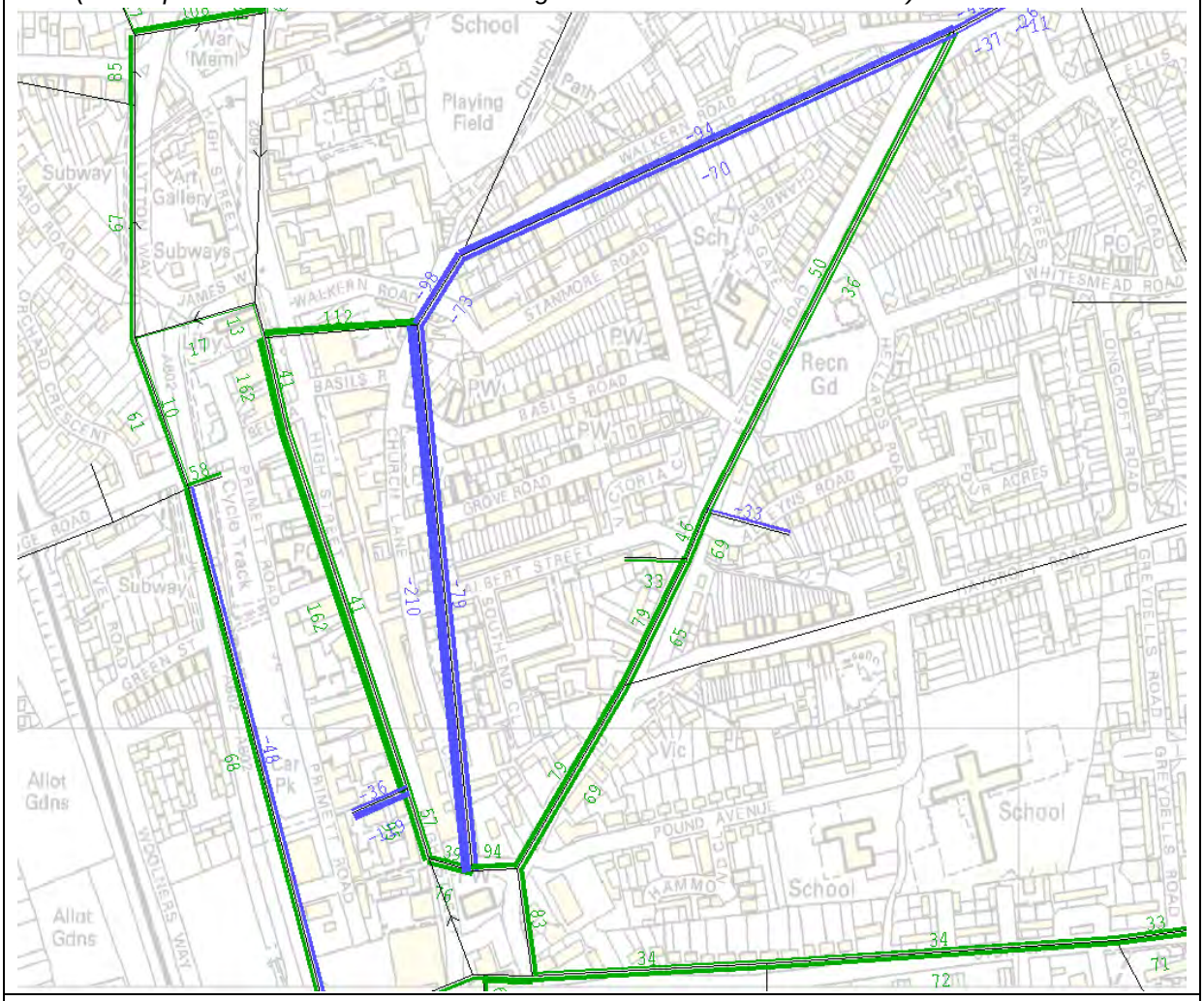
Scheme Name	Carry out further surveys to determine the effect of traffic which appears to re-route along Church Lane to avoid the High Street	
Scheme Reference:	HM9	
Problem References:	H1 H1.1 H2	Rat Running through Stevenage Church Lane being used for rat running to avoid High St Excessive vehicle speeds in parts of Stevenage
Scheme Status:	This scheme is included in the UTP	

Description of Proposals

This issue was raised at the stakeholder consultation as it was perceived that Church Lane was used as a rat run to avoid using the High Street. Church Lane runs parallel to the High Street and it could therefore be used as an alternative route to the High Street. The High Street has some high levels of activity as vehicles use the route to access the shops and workplaces along the route. There is also a lot of on-street parking along the route, which can hamper drivers progression along the route and mean that the journey can be stop-start, therefore increasing the overall journey time of the route.

The option of closing Church Lane to through traffic was investigated in the traffic model to determine what the impact was as traffic re-routes when it cannot travel along the length of Church Lane. This has the impact of increasing trips on the High Street by approximately 200 pcus two-way in the AM and increasing trips on Letchmore Road by approximately 140 pcus two-way in the AM peak.

Change in flows on the local network as a result of closing Church Lane to through traffic – AM peak hour (blue represents a decrease in flow and green means an increase in flow)



The impact of this traffic re-routing on to these route places additional pressure at some other junctions around the network. It also places additional pressure on the High Street which is already a busy route and may cause issues with drivers moving in and out of parking spaces throughout the day. Closing Church Lane to through traffic also limits the permeability and route choice of the network. For these reasons the option of closing the route to through traffic is not going to be considered any further as part of the UTP.

An alternative option would be to introduce some form of traffic calming along Church Lane in an attempt to make the route less attractive. This would involve implementing physical measures to try and reduce speeds and therefore make the route less attractive. Normally traffic calming is implemented in response to an identified accident problem along a particular route. Analysis of accidents along this route for the last 4 years shows that there have been no accidents along this section of Church Lane. The surveys undertaken as part of the UTP were not specifically focused around this issue so it is difficult to substantiate the scale of this re-routing problem. As a result of this it is not going to be taken forward as part of the UTP as a scheme, but is recommended that further survey work is undertaken to determine the extent of the problem and then develop an appropriate scheme if this is required.

Location Plan/outline Scheme Plan
Supporting Photograph(s)

Design Considerations	**Proposed Solutions**	**Are solutions sufficient to overcome issues? (Y/N)**
Need further survey work on traffic movements to identify extent of the problem	Commission registration plate matching surveys to determine number of trips diverting along Church Lane	Y
Issue with closures of routes could have an impact on emergency services access times so consultation would be required	Engage with emergency services early on	Y

Links to other UTP schemes:	

Contribution to Objectives / Indicators:	UTP Objectives	10) Reduce rat running and excessive vehicle speeds across the highway network.
	LTP Indicators	

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
Registration plate surveys at 4 locations	£3,200	Survey required at the northern and southern end of High Street and Church Lane – Assumed to £800 per site
TOTAL COST FOR DELIVERY	£3,200	

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	**Y**	~~**N**~~
Can the scheme be delivered without third party involvement?	**Y**	~~**N**~~
Do all elements of the scheme involve standard work processes?	**Y**	~~**N**~~
Can the scheme be delivered in the short term?	**Y**	~~**N**~~
Where 'N' details for overcoming deliverability risk:		

Other Information/Additional Notes:
Further survey work is required to establish the extent of the re-routing problem

Scheme Name	Introduce ramp metering on junction 8 of the A1(M)	
Scheme Reference:	HM11	
Problem References:	CO1	Congestion on the A1(M) impacting on Stevenage
Scheme Status:	This scheme is included in the UTP	

Description of Proposals

The trunk road network within England and Wales if the responsibility of The Highways Agency. They are continually looking at ways of keeping motorways and trunk roads running smoothly. Ramp metering is a key measure for doing this by reducing delays at junctions. It works by managing the traffic on slip roads. During busy periods, signals release just a few vehicles at a time. This prevents merging and mainline traffic from bunching together and creating a bottleneck which delays everyone.

By preventing or delaying flow breakdown the system provides the following benefits:

- Greater throughput of traffic during peak periods;
- Less congestion and improved traffic flows;
- Smoother and more reliable journey times;

The ramp metering system uses signals on the slip road which come into operation when traffic sensors on the main carriageway indicate heavy traffic. Traffic conditions are monitored and signal timings are constantly updated. The system also watches the slip road to ensure queues do not back up onto local roads and cause localised congestion problems.

Following the detailed evaluation of the initial implementation of sites, a number of benefits were identified. Sites are now monitored regularly and the signals adjusted to optimise performance. Surveys have shown that on average (*source: www.highways.gsi.gov.uk)*:

- Travel time past the junction falls by 13%;
- Downstream speed increases by 7.5%;
- Delays to vehicles on the slip road are relatively short.

Any scheme proposed as part of the UTP would need to be designed and implement in very close cooperation with the HA as they control the truck road network. There are already some ramp metering schemes in place on the A1(M) in and around Stevenage, and some other proposed these include:

- A1(M) Jct 7 southbound on slip ramp metering.
- Jct 6 northbound on slip ramp metering.
- Jct 7 northbound on slip ramp metering – this is subject to a GlaxoSmithKline planning application. It is likely that the application will take some time to resolve, but the scheme could be implemented on the ground very quickly after.

The only remaining junction on the A1(M) that is within the scope of the Stevenage UTP study to implement ramp metering would be junction 8. The implementation of Ramp Metering Schemes is dependant on the requirements laid out in Interim Advice Note 103/08 – Advice Regarding the Assessment of Sites for Ramp Metering (IAN103/08). IAN 103/08 draws on the results of 30 recent ramp metering schemes to define a detailed set of criteria for the installation of ramp metering on motorways, though it is also applicable to dual carriageways. These criteria relate to both the traffic conditions and the physical layout as detailed below.

Traffic Criteria

For a site to be suitable for ramp metering, flow breakdown must occur on the mainline carriageway with speeds reducing to below 50kph (30mph) on a regular basis for a significant amount of time. For ramp metering to be effective, this breakdown must be attributable to the effects of merging traffic or

the resultant downstream flow; must be a regular occurrence; and occur for long periods or over a significant distance. Ramp metering has been found to be particularly effective in situations where:

- merging traffic interferes with mainline traffic;
- joining traffic conflicts with traffic leaving the carriageway at major downstream junctions;
- temporary peaks in joining traffic causes congestion;
- on-slips fed by signalised junctions cause large volumes of merging traffic;
- high on-slip flows overload merge capacity;
- on-slips are affected by flow breakdown downstream;
- queuing traffic is already a problem on the on-slip during peak periods.

Slip road traffic flow should be high enough to negatively impact on main carriageway traffic. A flow in excess of 400 veh / lane / hour is considered a minimum threshold for a flow breakdown to occur in mainline traffic. However, if both slip road and mainline demand is too high, ramp metering will lead to excessive queuing on the slip road which is inadvisable. IAN 103/08 suggests a maximum on-slip flow of 900 veh / lane / hour but ramp metering can still work with flows up to 1250 veh / lane / hour dependent on the length of the slip road, percentage HGV and gradient of the on-slip. In this situation, reference should be made to the 'MCH 2470 – Ramp Metering Technical Design Guidelines'.

Junction Characteristics

IAN103/08 is based on experience of common junction layouts therefore the optimum site configuration for the installation of ramp metering is a two lane slip road with a tapered merge onto a three lane main carriageway. However, sites with other characteristics such as lane gain from slip road; ghost islands; two or four lane carriageways; and curved on-slips can also benefit from ramp metering though further advice would need to be sought.

There are no individual characteristics that rule out a site for ramp metering but the main consideration is the practicality of safely locating the stop line which is typically 45m from the start of the soft nosing. Specifically, there should be sufficient site lines to the stop line and queue control area to account for the high approach speeds. MCH 2470 Section 4 states that the slip road layout can be modified from one lane to two lanes to increase the storage area, if necessary.

With ramp metering in operation, there should be sufficient distance between the stop line and main carriageway for vehicles to accelerate and the slip road should be able to store a sufficient number of vehicles so that, when vehicles are queuing, vehicles do not back up beyond the start of the slip road. Assessment of the desired operational speed, queuing capacity requirements and stop line placement should be determined using 'MCH 2470 – Ramp Metering Technical Design Guidelines' taking into account platoon size, number of HGVs, vehicle acceleration and gradient.

The Table overleaf summarises the criteria set out for the installation of ramp metering. Whilst not all these criteria are directly applicable to the A1(M), they serve as guide for an initial assessment of these options.

Parameter	Minimum Value		Maximum Value	
	Ideal	Acceptable	Ideal	Acceptable
Annual delay at speeds below 50kph (30mph)	10,000 vehicle hours delay	100 hours	No maximum value	
Downstream mainline flows per lane (vph)	1,500	Appreciable based on local knowledge	No maximum value	
Slip road flows per lane (vph)	400	300	900	1250
Slip road flow as percentage of downstream flow (%)	10	5	30	50

Scheme Justification

To determine whether these criteria are satisfied requires a lot of traffic data. As part of the UTP a large quantity of existing traffic data was collated but unfortunately some of the data needed to undertake the full assessment of the junction is not available. The relevant information that was available is summarised below.

Parameter	A1 (M) Junction 8	
	Northbound on-slip	Southbound on-slip
Annual delay at speeds below 50kph (30mph)	Unknown	Unknown
Downstream mainline flows per lane (vph)	1,560 (PM Peak)	1,510 (AM peak)
Slip road flows per lane (vph)	710 (PM flow)	227 (AM Flow)
Slip road flow as percentage of downstream flow (%)	45%	15%

Note: Traffic Data taken form 2008 surveys

The analysis above shows that all of the criteria in relation to flows at the junction fit in within the minimum and maximum IAN103/08 requirements. Unfortunately the annual delay figures for this junction are unknown. It would however be possible to pursue ramp metering at this junction on this basis. It should however be noted that the A1(M) between junctions 8 and 9 is currently 3 lanes with the northbound on-slip at junction 8 forming the start of this lane gain. This should not preclude this site from being considered for ramp metering but would need to be taken in to consideration. It would therefore be advisable to pursue this option further.

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Detailed assessment of measurements of sight lines etc	Carry out detailed design review of junction	Y

Land ownership of the slip roads where ramp metering will go.	Investigate ownership	Y
Consideration of integration with existing signalisation of Junction 8	Carry out assessment of signals and integrate with current system in place at junction 8	Y

Links to other UTP schemes:	

Contribution to Objectives / Indicators:	UTP Objectives	11) Address peak hour congestion on the highway network, both for the present and the future.
	LTP Indicators	

Outline Cost Analysis (Estimate at this stage)		
Works Element	**Est. Cost**	**Notes**
Preliminaries including site clearance, safety fencing	£21,000	
Traffic signs, inc markings	£35,000	
Lighting, electrical and comms	£85,000	
Misc Civil Engineering work	£20,000	
TOTAL COST FOR DELIVERY	£161,000	Does not include contingency, inflation or optimism bias

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	~~Y~~	N
Can the scheme be delivered without third party involvement?	~~Y~~	N
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	~~Y~~	N

Where 'N' details for overcoming deliverability risk:
It is currently unknown whether this can be delivered within the highway boundary, but this will need to be discussed with the HA
Would need involvement from the HA but this engagement has already begun as part of the UTP
Given that there are currently no plans to implement ramp metering at this site it is questionable whether it could be delivered in the short term, more likely the medium to longer term.

Other Information/Additional Notes:

Scheme Name	Implement and achieve the parking policies and ambitions contained in the Parking Strategy (2004)	
Scheme Reference:	HM18	
Problem References:	P1 P5	Perceived lack of parking provision at key destinations Imbalance between long and short stay parking provision
Scheme Status:	This scheme is included in the UTP	

Description of Proposals

This proposal has come about in response to some issues that were raised at the stakeholder consultation. It was felt by some consultees that there was currently not enough parking within the town centre and by some others that there was too much long stay parking. The UTP needs to respond to a number of national, regional and local sustainable objectives, not least the recently released DfT documents Delivering a Sustainable Transport System (DaSTS), which aims to encourage more sustainable travel. The result of too much long stay parking tends to encourage commuting parking, which in turn can encourage people to travel by car when other modes may be more appropriate. By getting the balance of long and short stay parking right you are able to ensure that the vitality of the town is sustained through high turn-over of short stay spaces with people coming to the town for shopping and leisure reasons, but at the same time provide enough long stay parking to make Stevenage a viable place to locate business.

The diagram below shows the location and capacity of the existing town centre car parks. In summary there are a total of 860 short stay spaces and 2,144 long stay spaces within or just outside the town centre. This would appear to be a good provision of parking spaces within the town centre, however there is a strong emphasis on long stay parking this making up 72% of the parking provision. Some of this parking provision (circa 450 spaces) is attributable to the rail station which it is expected would need to accommodate commuter parking but there is still a high number of long stay spaces.

It is important to consider this alongside other local centres in the region to determine how Stevenage compares. Concern is sometimes raised that by reducing the number parking spaces or changing the split between long and short stay spaces then other centres could become more attractive to would be visitors or shoppers. This benchmarking exercise has been done below and shows that Stevenage has less parking than a number of other local town centres with the exception of Luton and Rushden, but it is important to note that Stevenage is also somewhat smaller in terms of a retail core. The figures below for Stevenage do not include the parking provision brought about by the Tesco development which adds an additional 330 parking spaces, which although are intended for customers of the store do not appear to be enforced.

There is also a parking strategy in place for Stevenage which was developed in 2004. The ambition of the strategy is to increase the proportion of short stay spaces as a percentage of the total number of parking spaces. Given that there is already a strategy in place to try and re-address the proportion of long stay parking spaces within the town the UTP proposes that this strategy is implemented. This will need to be given careful consideration when the re-development of the town centre is implemented as this would be a key time in which to ensure that this strategy could be implemented.

Town	Population Catchments (,000 within 10km)	Retail Floor space (m^2) *1	Off-Street Parking Spaces *2	P&R Spaces	Catchment Population per Parking Space	Retail Floor space (m^2) per Parking Space	Parking Charges	
							Short Stay	Long Stay
Stevenage	185	150,000	3,004	0	61	49	1 hr: £1.00 2hr: £1.20 3 hr: £2.40 Up to 5 hours £2.70 Over 5hrs: £7.00	8.30am – 6pm: £3.50 Greater than 10hrs - £6
Bedford	148	207,500	4,053	480	36 (32 inc. P&R)	33 (29 inc. P&R)	1 hr: £1.00 2 hrs: £1.20 3 hrs £2.40	Up to 5 hrs: £2.50
Luton	294	195,000	1,461	0	201	92	1 hr: £0.50 2 hrs: £0.80 3 hrs £1.30	Up to 5 hrs: £2.60
Milton Keynes	232	270,000	16,350	240	14 (13 inc. P&R)	11 (11 inc. P&R)	Free Standard Rate £0.25 / hour Premium Rate £1.00 / hour	Up to 5 hours £2.00
Northampton	230	275,000	5,368	0	42	36	Standard £0.60 / hour Premium Rate £0.80 / hour	Up to 5 hrs: £3.00 - £4.00
Rushden (area wide)	131	120,000	522	0	250	52.5	Free	Free

PPG13 standard for non-food retail is 1 space per 20m^2 gross, say 15m^2 net.

*1 Retail floorspace taken as retail core areas of town centres from http://www.planningstatistics.org.uk/

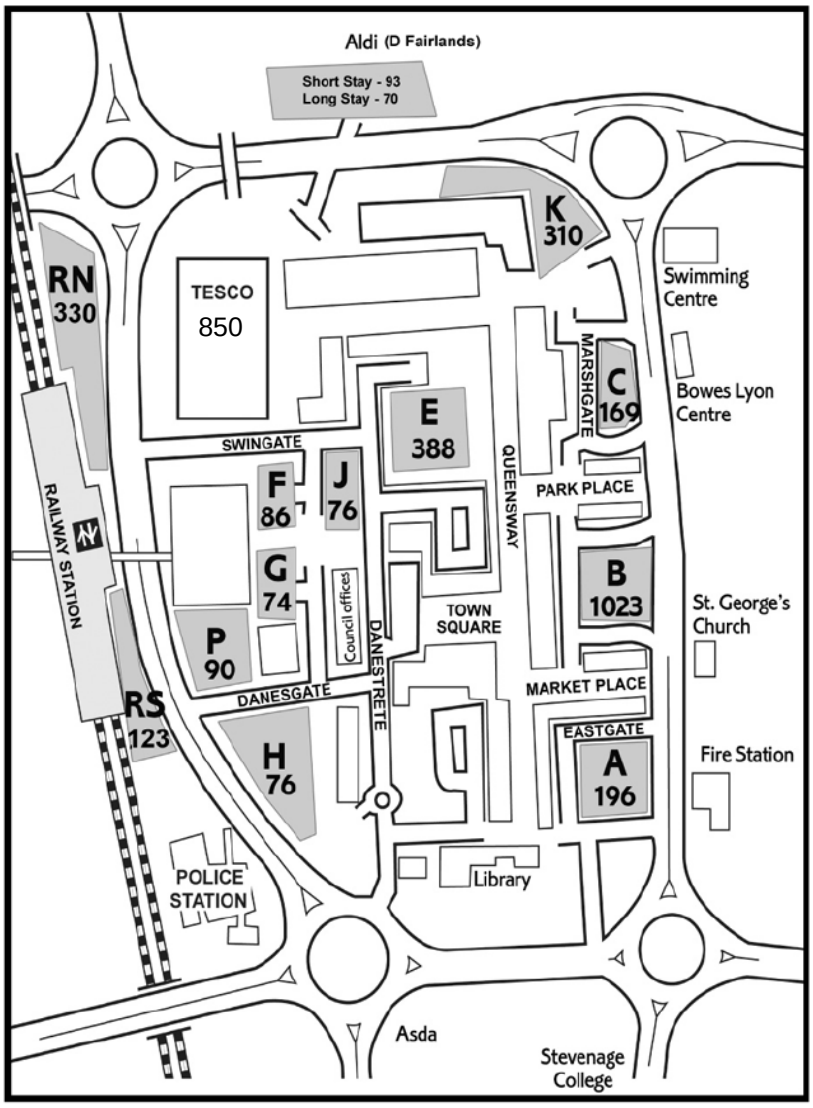
*2 This information is taken from the appropriate Borough Council website, stating where car parking can be found in the towns. It only refers to *off-street* car parks.

Location Plan/outline Scheme Plan

Supporting Photograph(s)

Short Stay Car Parks

C - Marshgate **E - Westgate multi-storey** **K - The Forum**



Long Stay Car Parks

A - Southgate

B - St. George's Way multi-storey

D - Fairlands Way

F - Swingate

G - Daneshill

H - Danesgate

J - Swingate East

P - Leisure Centre

RN - Railway North

RS - Railway South

Note: Tesco car park also provide parking provision although not council owned

Tesco Car Park

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Town Centre proposals do not apply appropriate split of long a short stay parking	Review TA produced as part of the regeneration proposals	Y

Links to other UTP schemes:	

Contribution to Objectives / Indicators:	UTP Objectives	12) Improve accessibility of key destinations for all users 5) Address peak hour congestion on the highway network, both for the present and the future.
	LTP Indicators	• Public transport patronage

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
No Costs appropriate for UTP as included as policy consideration		
TOTAL COST FOR DELIVERY		

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	~~Y~~	N

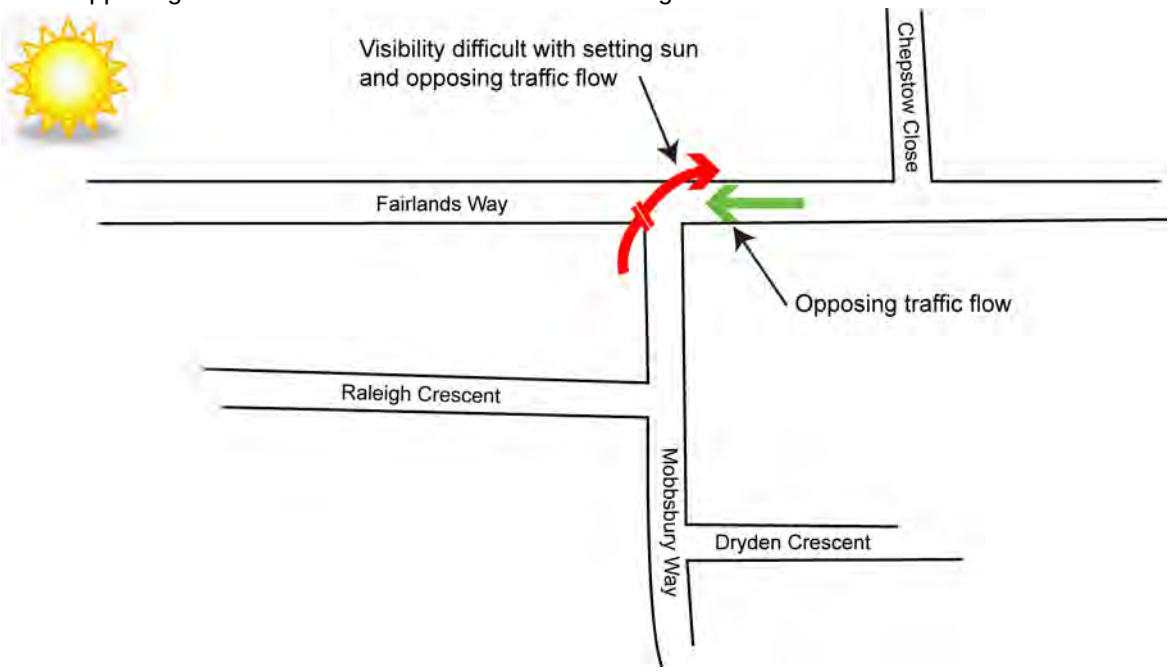
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk: Developers and Planning Authority will need to be involved to ensure agreed parking standards are appropriate.		

Other Information/Additional Notes:
This a policy based scheme that does not propose any specific measures as part of the UTP but flags up the need for this to be considered as part of the ongoing development of the town centre proposals.

Scheme Name	Widen Mobbsbury Way on Approach to Fairlands Way	
Scheme Reference:	HM28	
Problem References:	H7	Vehicles queuing trying to turn right out of Mobbsbury Way in Fairlands Way
Scheme Status:	This scheme is not included in the UTP	

Description of Proposals

An issue has been identified at the junction of Fairlands Way and Mobbsbury Way where traffic is queuing back up along Mobbsbury Way as it cannot turn right out on to Fairlands Way because of traffic opposing the movement. This is shown in the diagram below.



This issue is made worse by the fact that in the evening as vehicles are trying to turn right out of Mobbsbury Way are blinded by the setting sun when looking west to check for a safe gap to move out of the junction. In order to try and address this issue 3 options have been developed including:

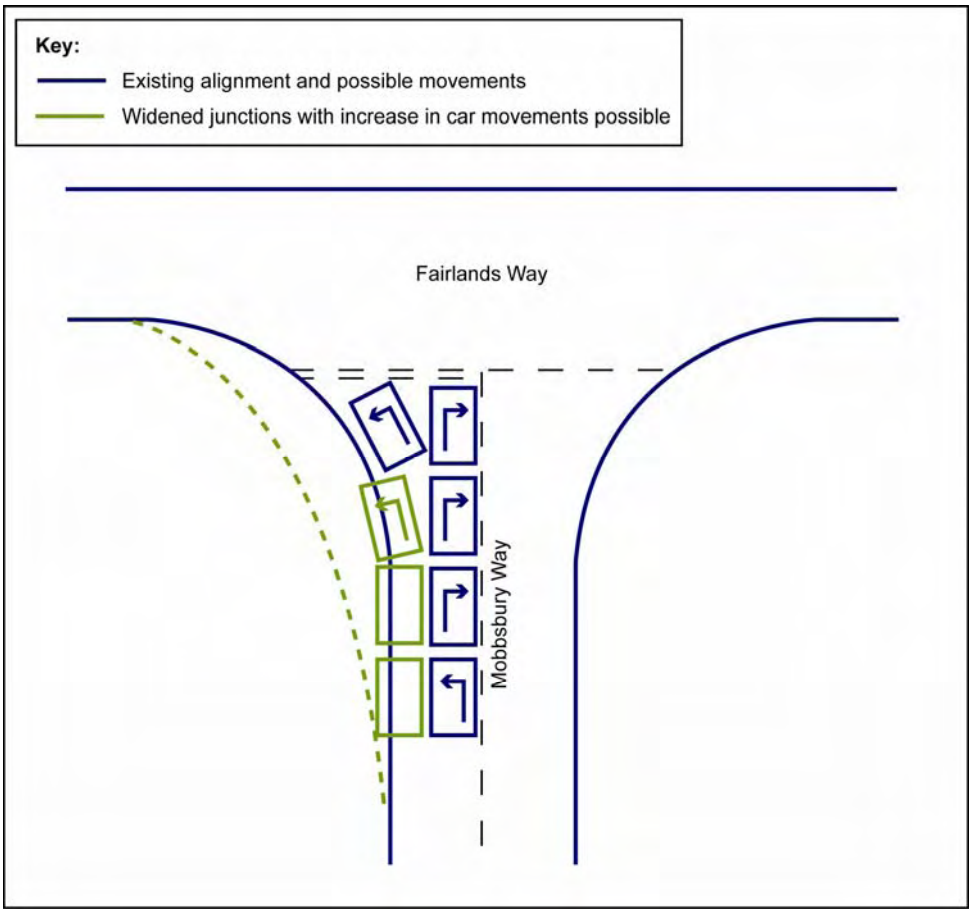
- HM28 - Widen Mobbsbury Way on Approach to Fairlands Way
- HM29 - Make it left turn only out of Mobbsbury Road on to Fairlands Way
- HM30 - Convert Mobbsbury Way/ Fairlands Way junction to a roundabout

Accident records at the junction have shown that there have been 3 accidents in the last 4 years but none have cited the sun as a contributing factor to the accident. However this does not mean that there is not potentially a safety issue at the junction.

Each of these schemes is being investigated separately, but only 1 recommendation will come forward in the UTP.

Location Plan/outline Scheme Plan

This scheme looks at an option of widening the junction at the top end of Mobbsbury to enable more cars to queue at the junction to turn right whilst also allowing enough space for vehicles to get past and continue to turn left out of the junction. This is shown in the diagram below.



Although this would increase the capacity of the junction it does not address the issue of vehicles being blinded by the sun. It is felt that the only way to address this issue would be to ban the right turn out of Mobbsbury Way, which is explained in more detail in 'HM29 - Make it left turn only out of Mobbsbury Road on to Fairlands Way'.

This option is therefore not being developed any further as part of the UTP

Supporting Photograph(s)

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Not being taken forward in the UTP		

Links to other UTP schemes:	• HM29 - Make it left turn only out of Mobbsbury Road on to Fairlands Way • HM30 - Convert Mobbsbury Way/ Fairlands Way junction to a roundabout

Contribution to Objectives / Indicators:	UTP Objectives	6) Address peak hour congestion on the highway network, both for the present and the future.
	LTP Indicators	

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
None – Scheme not being taken forward		
TOTAL COST FOR DELIVERY		

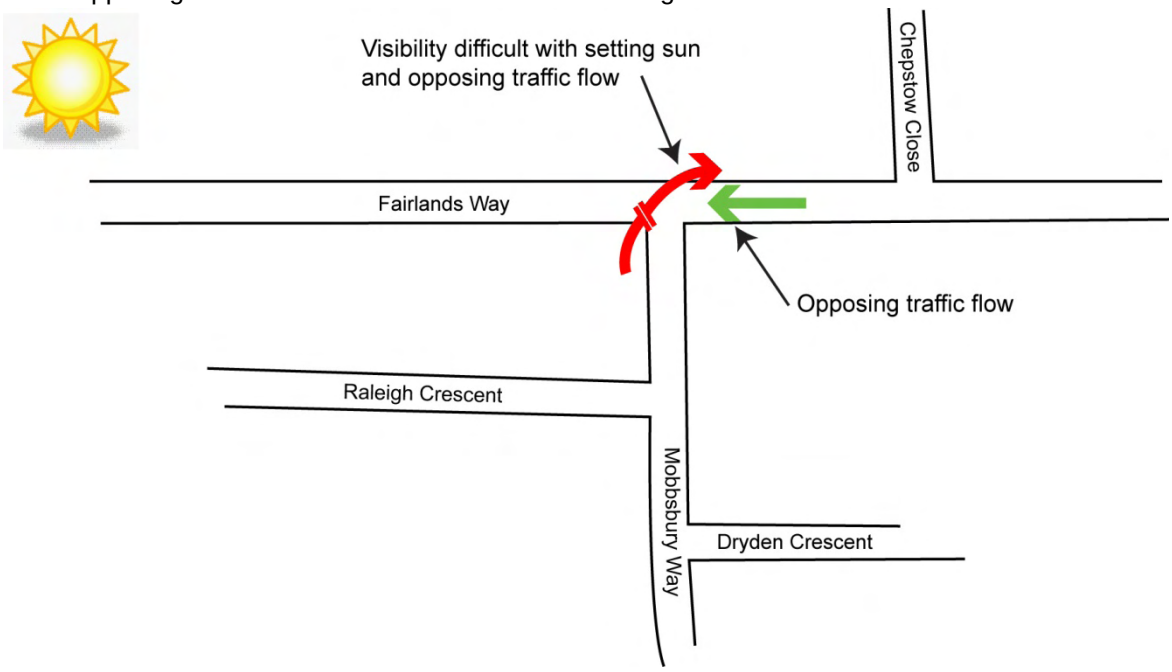
Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	N
Can the scheme be delivered without third party involvement?	Y	N
Do all elements of the scheme involve standard work processes?	Y	N
Can the scheme be delivered in the short term?	Y	N
Where 'N' details for overcoming deliverability risk:		

Other Information/Additional Notes:

Scheme Name	Make it left turn only out of Mobbsbury Road on to Fairlands Way	
Scheme Reference:	HM29	
Problem References:	H7	Vehicles queuing trying to turn right out of Mobbsbury Way in Fairlands Way
Scheme Status:	This scheme is included in the UTP	

Description of Proposals

An issue has been identified at the junction of Fairlands Way and Mobbsbury Way where traffic is queuing back up along Mobbsbury Way as it cannot turn right out on to Fairlands Way because of traffic opposing the movement. This is shown in the diagram below.



This issue is made worse by the fact that in the evening as vehicles are trying to turn right out of Mobbsbury Way are blinded by the setting sun when looking west to check for a safe gap to move out of the junction. In order to try and address this issue 3 options have been developed including:

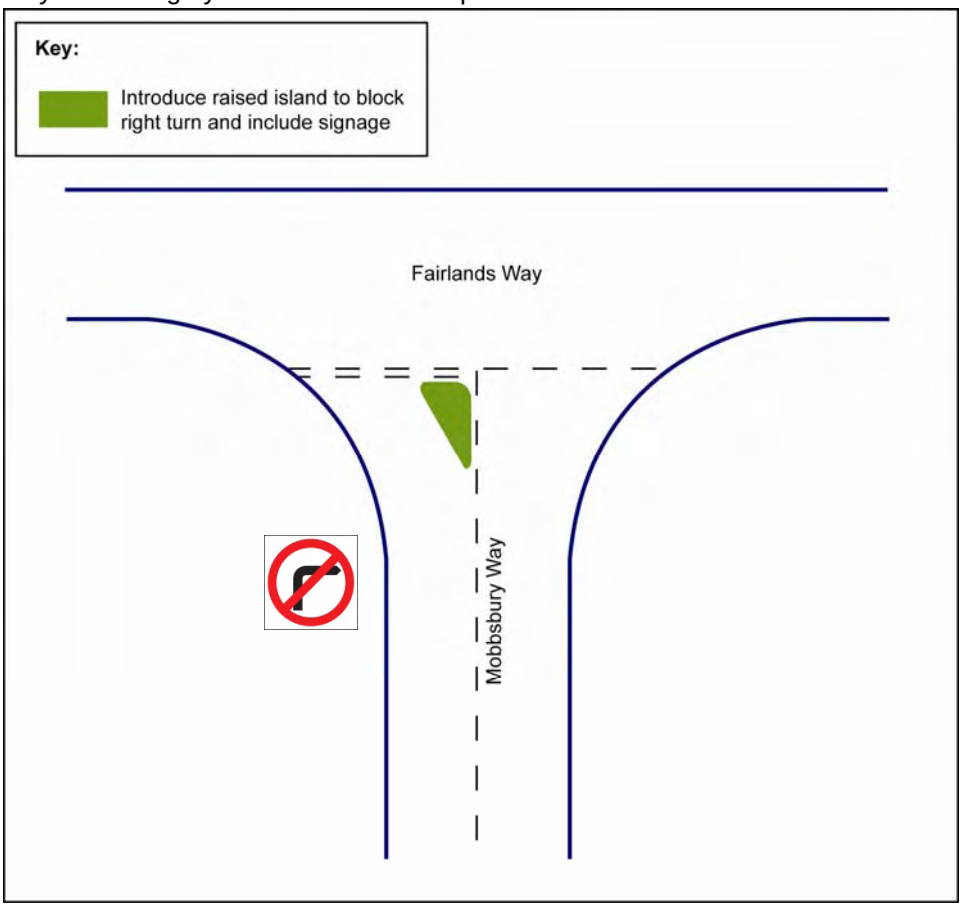
- HM28 - Widen Mobbsbury Way on Approach to Fairlands Way
- HM29 - Make it left turn only out of Mobbsbury Road on to Fairlands Way
- HM30 - Convert Mobbsbury Way/ Fairlands Way junction to a roundabout

Accident records at the junction have shown that there have been 3 accidents in the last 4 years but non have cited the sun as a contributing factor to the accident. However this does not mean that there is not potentially a safety issue at the junction.

Each of these schemes is being investigated separately, but only 1 recommendation will come forward in the UTP.

Location Plan/outline Scheme Plan

A solution to this problem could be in the introduction of right turn ban out of Mobbsbury Way. Although this may restrict some movements at the junction a model test has been carried out to determine the impact of any re-routing as a result of this ban. The Mobbsbury Way / Fairlands Way junction is only located approximately 300m east of the roundabout junction with Verity Way. This therefore means that any vehicles wanting to turn right out of Mobbsbury would need to divert and turn left out of Mobbsbury Way and double back at the roundabout with Verity Way to travel eastbound of Fairlands Way. Model testing showed that this short diversion did not create any significant problems on the network around this area with delay at the roundabout with Verity Way only increasing by 1 second in the AM peak hour.



This scheme addresses all of the issues that have been identified at the junction with delays being reduced along Mobbsbury Way, but no significant additional delay caused elsewhere. It also addresses the issue of poor visibility to the left for vehicles turning right out of Mobbsbury Way. This scheme is therefore being taken forward as part of the UTP.

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)
Measures put in place do not prevent people from turning right out of Mobbsbury Way	Detailed design work will ensure appropriate physical measures (such as traffic islands) are in place to prevent this movement.	Y
Visibility splays to the right for	Detailed design work will ensure the	Y

vehicles turning out of Mobbsbury Way need to be appropriate	appropriate visibility splays are provided	

Links to other UTP schemes:	• HM28 - Widen Mobbsbury Way on Approach to Fairlands Way • HM30 - Convert Mobbsbury Way/ Fairlands Way junction to a roundabout

Contribution to Objectives / Indicators:	UTP Objectives	7) Address peak hour congestion on the highway network, both for the present and the future.
	LTP Indicators	

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
Raised Island	£500	Assume 3m wide, 5m long, triangular
No right turn sign * 2	£1,000	Including posts, foundations and external lighting units
Electrical connections	£500	Assuming feed from street lighting (not including statutory undertakers requirements)
Design fees	£400	
Supervision	£200	
Miscellaneous costs	£1,400	Including allowances for contingencies, preliminaries and inflation
TOTAL COST FOR DELIVERY	£4,000	

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	Y	~~N~~
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk:		

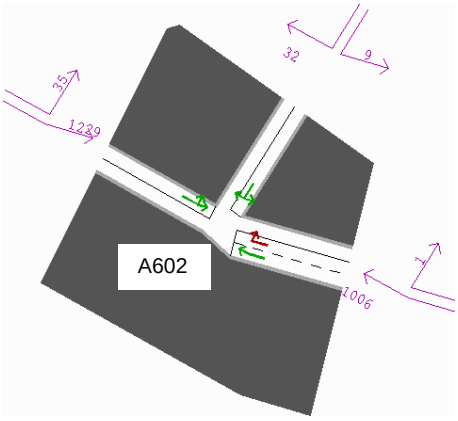
Other Information/Additional Notes:

Scheme Name	Introduce peak hour signals at the junction of Aston Lane/A602 Broadhall Way	
Scheme Reference:	PCM4	
Problem References:		No problem reference as this was suggested as a solution at the public consultation, so has not been driven by issues.
Scheme Status:	This scheme is not included in the UTP	

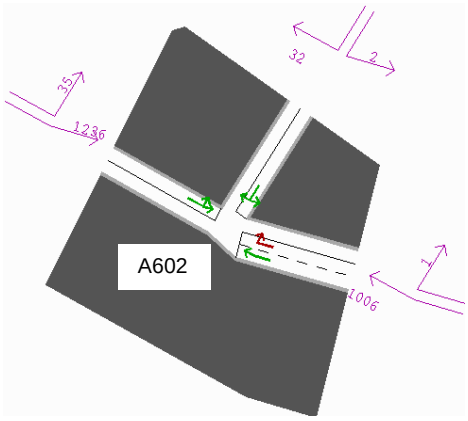
Description of Proposals

This scheme was raised at the public consultation as a solution to reducing envisaged congestion which occurs at this junction during the peak hours. The junction is currently a t-junction, with a segregated right turn from the A602 into Aston Lane. The current road layout would need to be redesigned to allow for signals which would be in operation during the peak hours. The issue of congestion at this junction was raised due to the conflict of traffic turning out of Aston Lane onto the A602. The introduction of signals would improve the priority of this movement making it easier and attempt to alleviate any congestion or delay which may exist.

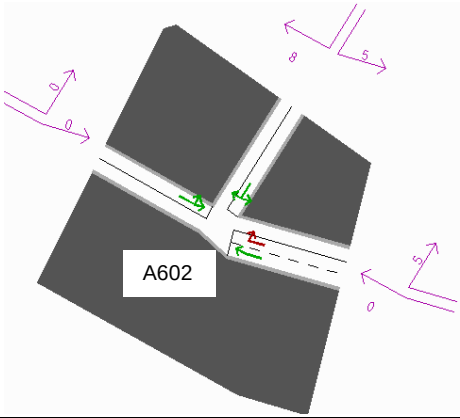
The model shows that there is a low level of demand along Aston Lane during the peak hours and there is no evidence of any congestion at this junction during the peak hours. The level of demand modelled along Aston Lane is low, fewer than 50 vehicles an hour during the AM peak and following the introduction of signals does not increase. The demand is even lower in the evening peak. The introduction of signals actually induced delay at this junction, particularly for traffic turning right from the A602 and traffic from Aston Lane.

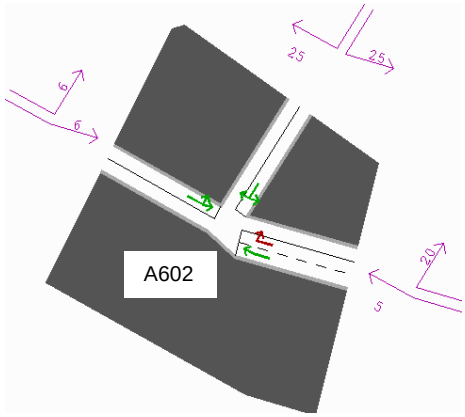


Demand without Signals (pcu/hr) – AM Peak



Demand with Signals (pcu/hr) – AM Peak





Delay without Signals (seconds) – AM Peak	Delay with Signals (seconds) – AM Peak

Therefore, given the low level of demand along Aston Lane in the morning and evening peaks, allied with the cost of redesigning the junction to accommodate signals and the ineffectiveness of the signals, it is not considered necessary to signalise this junction.

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)

Links to other UTP schemes:	

Contribution to Objectives / Indicators:	UTP Objectives	
	LTP Indicators	

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
TOTAL COST FOR DELIVERY		

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	Y	~~N~~
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk:		

Other Information/Additional Notes:

Scheme Name	Make Gresley Way part of the ring road	
Scheme Reference:	PCM17	
Problem References:		No problem reference as this was suggested as a solution at the public consultation, so has not been driven by issues.
Scheme Status:	This scheme is not included in the UTP	

Description of Proposals
This scheme was tabled at the public consultation as a means of extending the ring road however it was not clear whether this should involve dualling Gresley Way. The modelling exercises undertaken as part of the UTP have shown that this route does not need to upgraded to dual carriageway given the fact that motorists already treat it as an extension to the ring road. It is therefore considered that upgrading Gresley Way would not be beneficial or indeed cost effective. As such this specific scheme is not being progressed through the UTP.

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)

Links to other UTP schemes:	

Contribution to Objectives / Indicators:	UTP Objectives	
	LTP Indicators	

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
TOTAL COST FOR DELIVERY		

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	Y	~~N~~
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk:		

Other Information/Additional Notes:

Scheme Name	Open Hertford Road	
Scheme Reference:	PCM18	
Problem References:		No problem reference as this was suggested as a solution at the public consultation, so has not been driven by issues.
Scheme Status:	This scheme is not included in the UTP	

Description of Proposals

This scheme was raised at the public consultation and refers to the opening of the bus gate at the western end of Hertford Road at the junction with Ashdown Road, which currently does not allow private vehicles to route through this access.

Despite the narrow access, bus services route both ways, however without widening it would not be feasible to make this road two-way to all traffic. Give way priority signs could not be used because of the close proximity of the junction with Ashdown Road and possible conflicts that this could cause.

There are two options for opening Hertford Road to all traffic:

- Widening Hertford Road to the junction with Ashdown Road to allow two-way traffic;
- Opening Hertford Road as one-way to all traffic in the westbound direction and re-route the current bus services which would otherwise route against the flow of traffic.

Both options have been tested in the model in 2014, because if Hertford Road was 'opened' it is envisaged that it would be by this future year.

Current road layout of Hertford Road westbound at the approach to Ashdown Road

Current road layout of Hertford Road westbound at the approach to Ashdown Road

Widening Hertford Road to the junction with Ashdown Road to allow two-way traffic

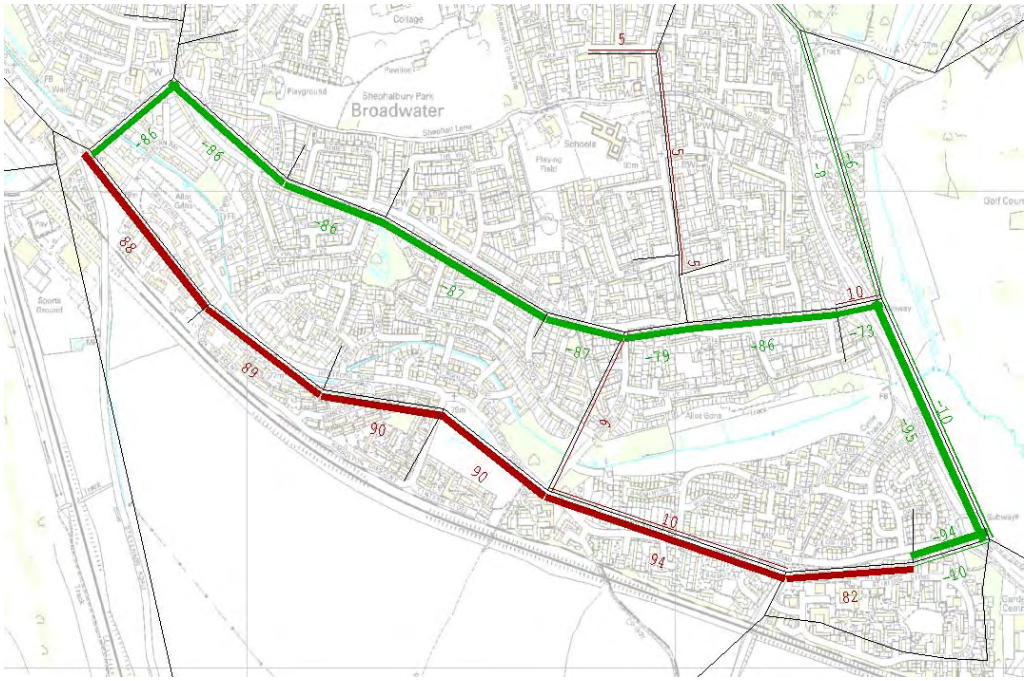
This option would require the widening of Hertford Road close to the junction with Ashdown Road to allow two-way traffic. This may prove expensive either through a compulsory purchase order to obtain land south of Hertford Road or by widening within the existing highway boundary with the removal of the existing bus shelter and build out, but neither would be feasible.

If the road was widened, the traffic impact in the area in the morning peak would be a small amount of re-routing westbound from a parallel route (Broadwater Crescent), fewer than 120 vehicle per hour. The impact in the evening peak would be slightly more widespread:

- Increase in traffic along Hertford Road in both direction (100pcus eastbound / 140pcus westbound);
- Increase northbound on Ashdown Road and Oaks Cross (70pcus and 60pcus respectively);

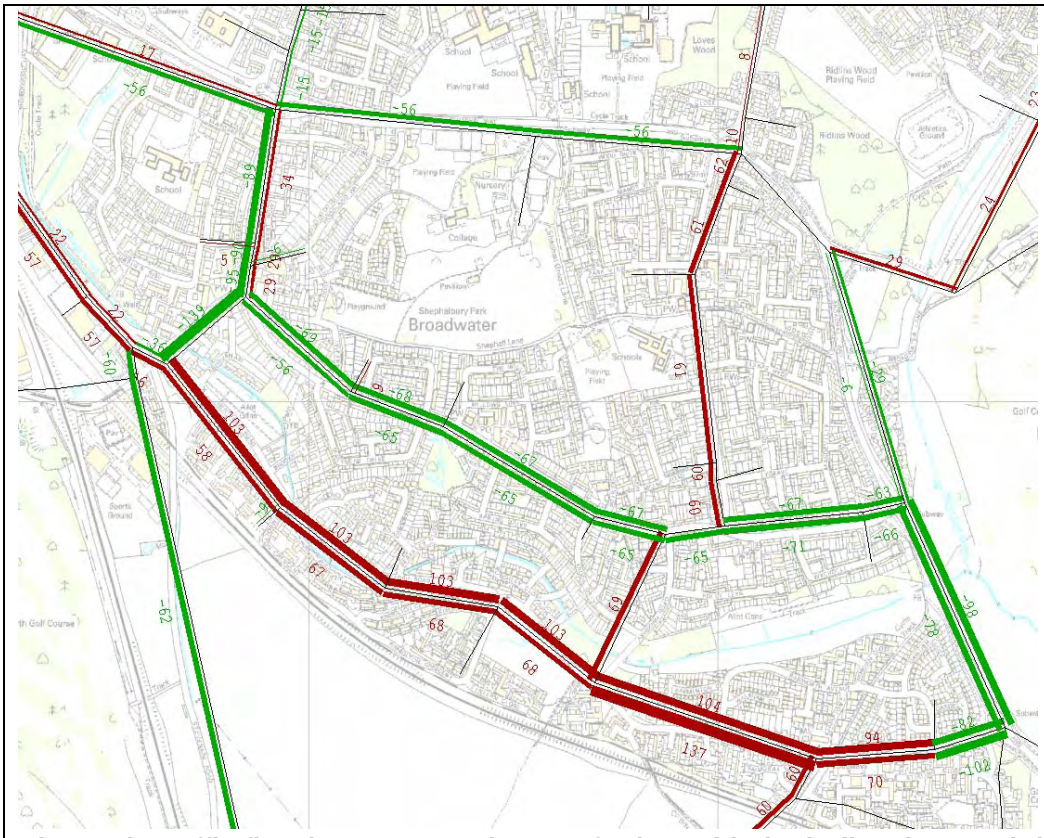
- Increase on B197 London Road (60pcus northbound / 20pcus southbound);
- Decrease in both directions along Broadwater Crescent (65pcus westbound / 70pcus eastbound);
- Decrease on A602 (60pcus in both directions).

The impact of opening Hertford Road would result in an increase in traffic on local residential roads at the expense of traffic using the main roads around Stevenage. This is unlikely to benefit the local area and could pose possible safety problems from an increase in trips through the area.



Change in traffic flow between opening Hertford Road in both directions and the current Bus Gate layout – 2014 Morning Peak

Increase in traffic as a result of the new layout is as Red, with a decrease shown as Green. Values on the diagram represent the change in flow (pcus/hr).



Change in traffic flow between opening Hertford Road in both directions and the current Bus Gate layout – 2014 Evening Peak

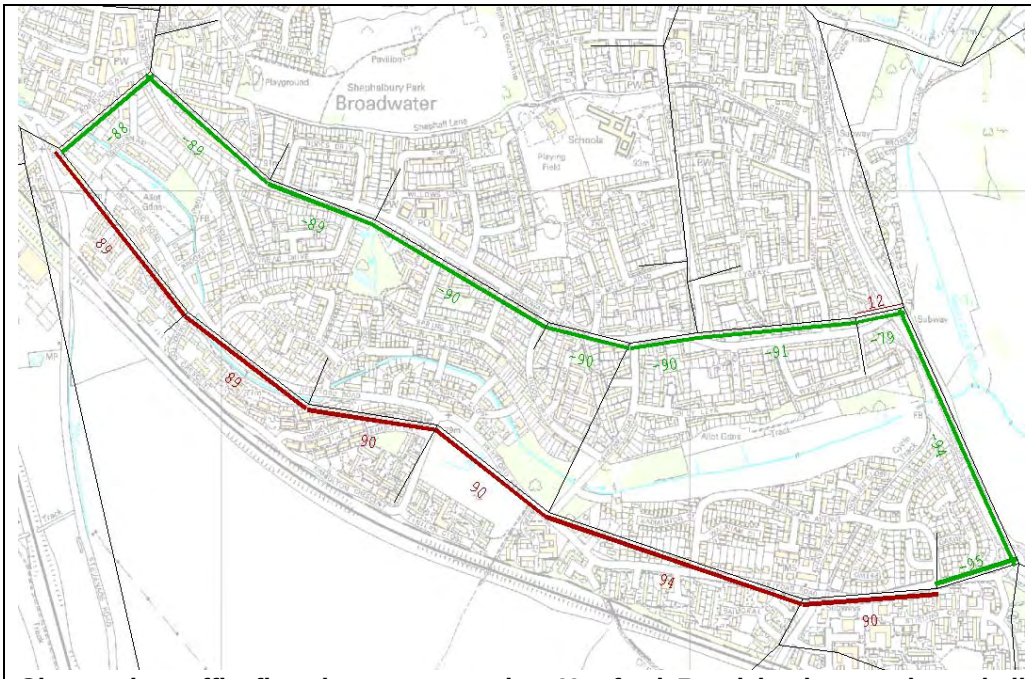
Increase in traffic as a result of the new layout is as Red, with a decrease shown as Green. Values on the diagram represent the change in flow (pcus/hr).

It can be seen that there are no tangible traffic benefits to the local area from opening Hertford Road to all traffic. It has been shown that the opening of Hertford Road could encourage more traffic to use the area as a cut through to avoid the main roads, which could pose possible safety problems to the area. The safety benefits for this option cannot be assessed but there are unlikely to be any because of the increase in traffic in the area. The opening of Hertford Road to two-way traffic is unfeasible because it does not deliver any quantifiable traffic benefits and could potentially create more problems.

Opening Hertford Road as one-way to all traffic in the westbound direction and re-route the current bus services which would route against the flow of traffic

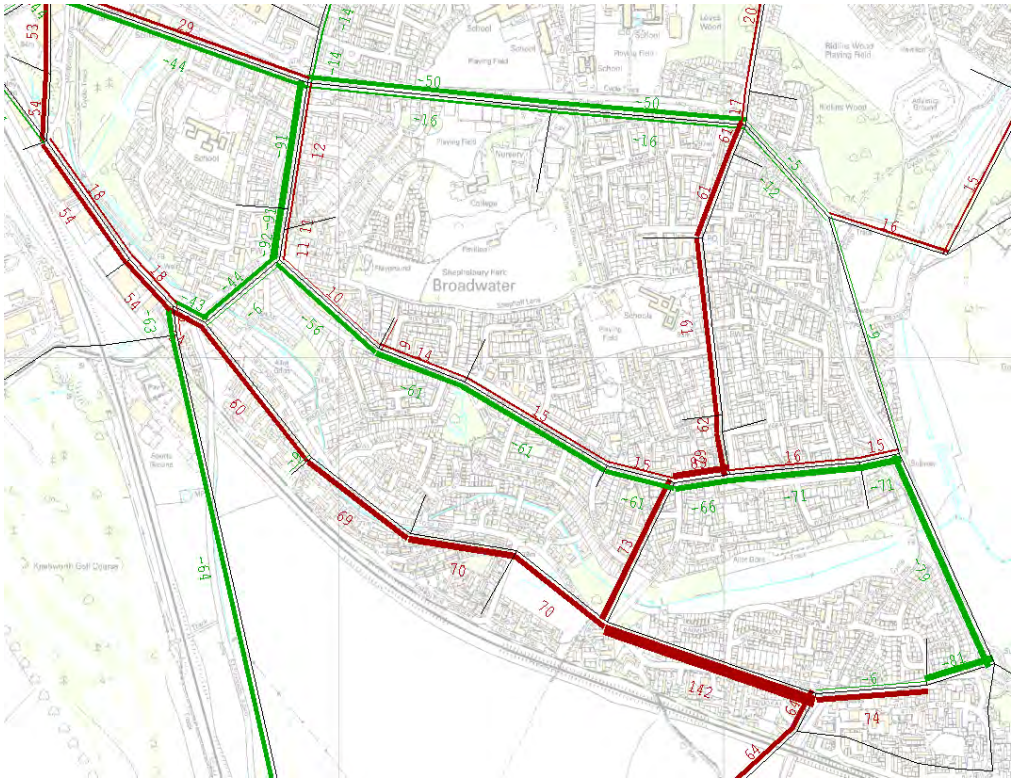
Bus services SB8 and SB16 currently use the bus gate in both directions, but if Hertford Road was opened to all traffic westbound then current services going against the flow of traffic could cause potential safety issues so would need to be re-routed. The traffic impact of opening Hertford Road in one direction in the morning peak is very similar to the opening of Hertford Road as two-way. Approximately 100pcus in the westbound direction re-route from Broadwater Crescent to Hertford Road. The impact in the evening peak is also similar to opening Hertford Road as two-way to all traffic, although generally only in the westbound direction.

- Increase on Hertford Road westbound (140pcus);
- Increase northbound on Ashdown Road and Oaks Cross (70pcus and 60cpus respectively);
- Increase on B197 London Road northbound (55pcus);
- Decrease on Broadwater Cresecent westbound (65pcus);
- Decrease on A602 westbound (45pcus) and eastbound (50pcus).



Change in traffic flow between opening Hertford Road in the westbound direction and the current Bus Gate layout – 2014 Morning Peak

Increase in traffic as a result of the new layout is as Red, with a decrease shown as Green. Values on the diagram represent the change in flow (pcus/hr).



Change in Traffic Flow between Opening Hertford Road in the Westbound Direction and the Current Bus Gate layout – 2014 Evening Peak

Increase in traffic as a result of the new layout is as Red, with a decrease shown as Green. Values on the diagram represent the change in flow (pcus/hr).

The opening of Hertford Road to all traffic in one direction has a negative impact on the area, similar to having it open in two directions, with a re-routing of traffic onto Hertford Road generally from main roads around the area. This is in addition to re-routing existing bus services which serve the area and could result in reduced accessibility for local residents. Therefore the opening of Hertford Road, even in one direction to all traffic does not deliver any reasonable traffic benefits to the local area and would be unfeasible.

Both schemes show negligible traffic benefits for the surrounding area by opening Hertford Road, either as one-way or two-way to all traffic. A small amount of re-routing occurs mainly from the parallel Broadwater Crescent route. The modelling has shown that it would be unfeasible to open the bus gate to all vehicles because it does not deliver any significant traffic benefits for the local area. In addition, opening Hertford Road as two-way could be costly and as one way could sever current public transport services.

In addition to this, consultation with Hertfordshire County Council has indicated that an understanding has been formed to resist investigations into "reopening" the Hertford Road bus gate unless it can be clearly demonstrated that the reopening will provide significant safety and traffic benefits to the local area and the majority of immediate surrounding area residents supported the move.

Design Considerations	**Proposed Solutions**	**Are solutions sufficient to overcome issues? (Y/N)**

Links to other UTP schemes:	

Contribution to Objectives / Indicators:	UTP Objectives	1) Increase the pedestrian priority and environment along key desire lines
	LTP Indicators	• Rights of Way

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
TOTAL COST FOR DELIVERY		

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	~~Y~~	N
Do all elements of the scheme involve standard work processes?	~~Y~~	N
Can the scheme be delivered in the short term?	~~Y~~	N
Where 'N' details for overcoming deliverability risk:		

Scheme Name	Provide a second access from Cavendish Road industrial area to Meadway	
Scheme Reference:	PCM19	
Problem References:		No problem reference as this was suggested as a solution at the public consultation, so has not been driven by issues.
Scheme Status:	This scheme is not included in the UTP	

Description of Proposals

This scheme relates to providing a second access to the Cavendish Road industrial area by introducing a link between Meadway and Compton Road. This scheme was raised during consultation in response to reported peak hour congestion at the existing access which is a signalised junction between Cavendish Road and Gunnells Wood Road. Due to the fact that there is only one access to the industrial area this is understood to exacerbate queuing issue for vehicles attempting to access Gunnels Wood Road.

Having carried out a site visit to assess this feasibility of this scheme it is considered possible to introduce an access between the northernmost section of Compton Road and Meadway, which at present is occupied by a car park associated with an industrial area. This route would then allow traffic from the industrial area to access the Clovelly Way/Gunnells Wood Road junction. However, further investigation of route has shown that Meadway and Redcar Drive would not be suitable roads for large amounts of traffic associated with the industrial area. Both roads are very narrow and contain blind corners which only allow for single file traffic. On street parking along Redcar Drive further exacerbates the problem of access and highlights the fact that this route was not designed to accommodate significant levels of traffic and at present is a no through road. It is therefore considered that providing a second access from Compton Road is not a practical solution due to the standard of the Meadway and Redcar Drive being unsuitable for the anticipated traffic from the industrial area. As such, this scheme will not be progressed through the UTP.

(*Source: www.google.co.uk*)

North on Meadway- this route is currently a no through road and contains several blind corners and no road markings

Redcar Drive- on road parking reduces the route to single file traffic which would not be appropriate for a second access to the industrial area.

Design Considerations	Proposed Solutions	Are solutions sufficient to overcome issues? (Y/N)

Links to other UTP schemes:	

Contribution to Objectives / Indicators:	UTP Objectives	
	LTP Indicators	• Congestion

Outline Cost Analysis		
Works Element	**Est. Cost**	**Notes**
TOTAL COST FOR DELIVERY		

Deliverability Assessment		
Can the scheme be delivered within the highway boundary?	Y	~~N~~
Can the scheme be delivered without third party involvement?	Y	~~N~~
Do all elements of the scheme involve standard work processes?	Y	~~N~~
Can the scheme be delivered in the short term?	Y	~~N~~
Where 'N' details for overcoming deliverability risk:		

Other Information/Additional Notes:

Scheme:
Reduce the need to travel through good land use planning

Scheme Reference:
HM2

Scheme Status:
This scheme is included in the UTP as a recommended policy

Purpose:
One way to assist in reducing the pollution and congestion caused by society is to effectively manage how new developments are planned and redeveloped. One way is to build residential areas at the right density, close to a mix of amenities and services thus reducing the need for people to travel.

Details:
Planning Policy Guidance 13 (Transport) details "land use planning has a key role in delivering the Governments integrated transport strategy. By shaping the pattern of development and influencing the location, scale, density, design and mix of land uses, planning can help to reduce the need to travel, reduce the length of journeys and make it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking, and cycling."

It is important that Hertfordshire County Council and Stevenage Borough Council consider the density of development and proximity of this to amenities and employment when considering future planning applications. It is important that an 'overall' approach is taken when considering future planning applications, ensuring that the overall strategic plan for the area is considered, not just the individual application itself.

It is also important to ensure that new communities are well served with appropriate transport services including cycle networks. Employers within the area can also encourage use of public transport through their travel plans.

SBC as the planning authority should also consider discouraging car usage through limiting the car parking spaces offered for new developments. By limiting the number of spaces, and implementing residents parking schemes, and car clubs it is hoped that car usage should be reduced.

Benefits:
- Reduced Congestion
- Reduced carbon emissions
- Increased public transport mode share

Risks:
- Policy not effective

Scheme:
Introduce traffic calming measures along Valley Way to reduce speeds

Scheme Reference:
HM5

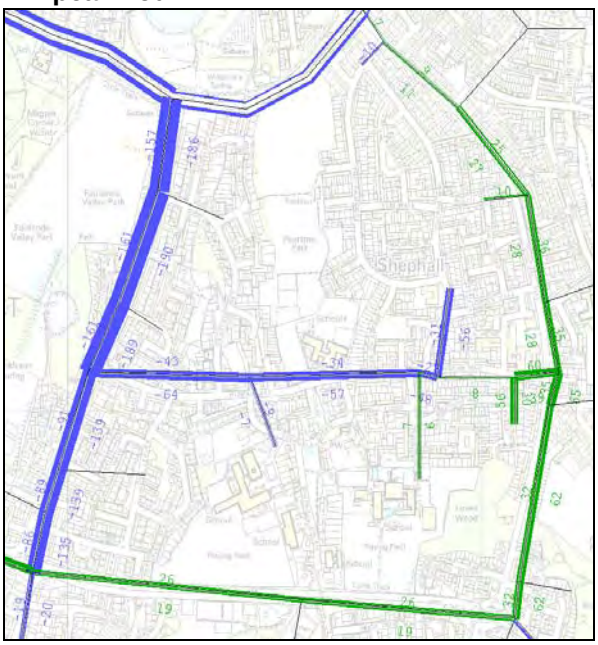
Scheme Status:
This scheme is not included in the UTP

Purpose:
This issue of speeding along Valley Way was considered to cause problems for on-street parked cars. This was raised specifically at the stakeholder consultation session. There is no data currently available to assess the vehicle speeds along this route and assessment of the accident data shows that there is no trend in accident statistics with 3 accidents along the route in the last 3 years all in the vicinity of the junction with Peartree Way.

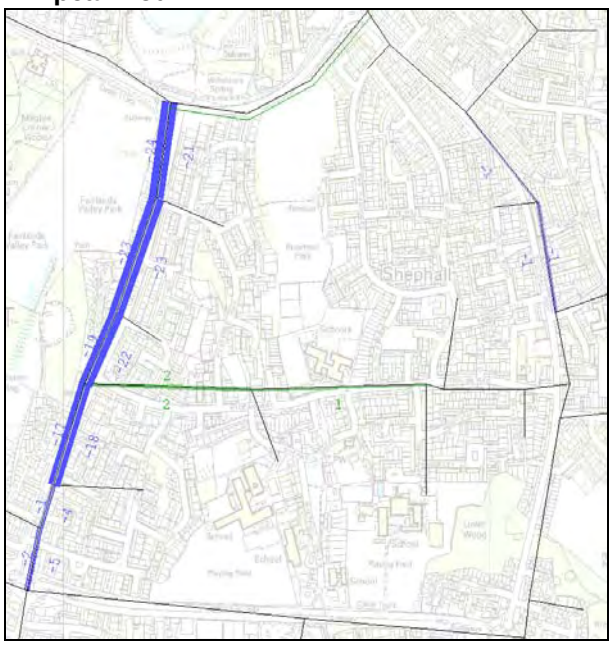
Details:
In order to test the implications of introducing traffic calming on the wider network a traffic calming scheme has been replicated within the traffic model which reduces the capacity of the road in line with the likely reductions that would be experienced if vertical and horizontal traffic calming was introduced.

Benefits:
Testing of traffic calming along Valley Way showed that the benefits are a reduction in traffic and slower speeds along the route. As a direct impact of the traffic calming, delays experienced at the junction of Valley Way / Six Hills Way are reduced along with delays at the Six Hills Way / Georges Way junction.

Change in Traffic Demand (pcus/hr)
AM peak hour



Change in Traffic Speed (km/hr)
AM peak hour



Risks:
The risks associated with implementing traffic calming is traffic re-routes away from Valley Way causing additional pressure at junctions in the local vicinity. Additional congestion and delay is experienced at the Monkswood Way / Broadhall Way roundabout and the junction of Six Hills Way / Homestead Moat. These two junctions already experience a high level of demand and subsequent delay before traffic

calming is implemented. These junctions would require significant improvements to ensure they could cope with the increase in traffic demand.

The speed on Hydean Way increases due to a reduction in traffic in the area. This route already has traffic calming in place to reduce speeds. This increase in speeds as a result of traffic calming on Valley Way is not a positive effect for the largely residential area.

Conclusion:
As a result of this model testing and the fact that there is not an identified accident problem in this location this scheme is not being considered any further within the UTP.

Scheme:
Increase the throughput of major roundabouts by using either grade separation or filter lanes

Scheme Reference:
HM8

Scheme Status:
This scheme is included in the UTP

Purpose:
The modelling has shown that in each of the future year scenario's there is an increasing need to improvements to be made to the highway network to ensure that it continues to operate satisfactorily. This will require a significant number of minor adjustments to signing and lining to try and squeeze as much capacity out of the network as possible. However as demand increases, particularly in the So Something scenario's there is a requirement to implement a number of more significant schemes including new road links and significant junction enhancements to accommodate the future demand

Details:
The packaging of options for testing in the model is discussed and explained in the Main UTP document. In line with the Route User Hierarchy all of the schemes which had been identified in the current transport in relation to disabled users, walking, cycling, and public transport were tested to develop a setoff schemes defined as 'Package A'. This provided a foundation to work from which had addressed most of the issues around the access and sustainable modes but had not necessarily dealt with the junction and congestion related issues. There congestion and highway capacity issues could have either come forward as a result exiting problems or problems that had been created through the implementation of the Package A options.

A large number of model tests were undertaken and schemes tested at a number of locations which would seek to ensure that congestion was kept to a minimum both in the base year and the future years. The series of tables below explains what has been required in terms of improvements around the network to ensure that delays are minimised and congestion reduced in the base year, 2014, 2021 and 2031 future in both the Do Minimum and Do Something scenario's. The methodology for the packaging of this in the traffic is explained in the Main UTP document.

Junctions upgraded in the 2008 Network (B Packages) (does not include A Packages of traffic calming / pedestrian signals etc):

Location	Junction type	Improvement
London Rd / Monkswood Way	RB	Improve lane definitions of southern approach to improve capacity
Fairlands Way / Gunnels Wood Road	RB	Increase capacity of northern a southern approach
Six Hills Way / St Georges Way	RB	Increase eastern approach to 2 lanes with lengthened flare
Six Hills Way / Valley Way	RB	Upgrade from mini-roundabout to a small roundabout and therefore increase capacity
Six Hills Way / Shephall Way	RB	Upgrade from mini-roundabout to a small roundabout and therefore increase capacity
Six Hills Way / Homestead Moat	RB	Upgrade from mini-roundabout to a small roundabout and therefore increase capacity
Six Hills Way / Rockingham	RB	Upgrade from mini-roundabout to a small roundabout