Traffic Calming Project, A36 Trunk Road, West Wellow

Draft Report

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1 Introduction

The A36 Trunk Road between Salisbury and Southampton has been the subject of progressive improvements to its traffic capacity and safety. One of these was to have been the West Wellow bypass which was withdrawn from the prioritised Trunk Road programme on 30 March 1994. It has therefore become necessary to consider an alternative means of improving this section of road. The study section is from the roundabout at Ower, linking to the M27, to sufficiently beyond the Wiltshire boundary to include the developed part of Plaitford; this boundary has been set to include the junction with Giles Lane.

In September 1993 Hampshire County Council commissioned a safety study of the section of the road within its boundary. The report of that accident study is regarded as a valuable introduction to this study and this report avoids excessive duplication of it. Additional accident data collected subsequently, and accident data for the Wiltshire section are presented here in a similar format. The brief summarised the accident report as highlighting "tail end" collisions, and it is worth emphasising that these are largely associated with turning traffic.

A particular problem site is the junction with Whinwhistle Road, for which Hampshire County Council have suggested improvement schemes including a right turn pocket, signalled junction and roundabout.

More generally, the object of this study is to consider the extent to which traffic calming techniques can be applied. The Highways Agency view this as perhaps being along the lines of the VISP (VIllage SPeed control) study.

This report firstly reviews objectives derived from the brief. It then reports limited observations and data related to the study section, and relates this to a discussion on the nature of traffic calming on main roads. This leads to an analysis of conflicts and issues, which are related to experience on the near continent, and to the findings of the VISP study.

It emerges that the A36 could be treated by extreme incompatible techniques or by an ineffective compromise which could all-too-easily arise from this type of study. Inevitably some difficult decisions must be made; the report aims to inform these decisions by offering a wide range of alternative measures, some of which are described in greater detail.

The conclusions suggest the need to concentrate the main thrust of the traffic calming approach on a relatively short central section.

2 Issues Arising from the Brief

2.1 Objectives

The main objective of the feasibility study is to prepare a feasibility design of traffic calming measures for the 5.6km section of the A36 to:

- Improve road safety;
- Enhance local amenity for residents;
- Embrace environmental anxieties; and
- Maintain operational traffic capacity.

Following consideration of this report, work is likely to be required subsequently to prepare final designs and contract drawings for the chosen traffic calming measures.

A subsidiary objective is for these measures to be included within the two-year research project recommended at the 12 January 1994 NMG meeting with implementation in 1995/96.

2.2 Considerations

Accident Reduction

There has already been an accident study of the A36 which presented accident data for the Hampshire section and drew conclusions from it. The report also presented findings from speed surveys at seven locations, and a brief review of daily traffic counts on the A36. Additional and more recent similar data is reviewed in the next chapter.

The primary accident pattern was found to be 'tail end' collisions, but it failed to find convincing evidence that this was due simply to following too close, excessive speed or excessive differential speed except to the extent that this was due to vehicles stopped for turning right or temporary traffic controls). However, lower speeds and greater driver awareness of the situation may reduce the incidence of such accidents.

Speed Limit

There may then be scope for reducing the existing 50 mile/hr limit to 40 or 30 mile/hr with appropriate calming measures to reinforce the limits.

The accident pattern has not revealed particular interaction with school attendance or other obvious short-term activities. Variable speed limits in the usual sense are not therefore appropriate in this section.

Road-marked speed roundels have had a mixed reception. They are worth considering here as they are used widely in the nearby New Forest and so there should not be objections over the issue of lack of consistency in markings between roads.

Calming Measures

A range of calming measures has been tested during the VISP Study and Bypass Demonstration Project. This, and ideas from continental experience, are dealt with more fully in subsequent sections of this report. Vertical deflections such as speed cushions were mentioned in the Study Brief, but could be inappropriate for both safety and environmental (noise and vibration) reasons, given the high percentage of heavy vehicles.

Amenity and Environmental Aspects

MVA's SOBETMA (SOuth Birmingham Environmental Traffic MAnagement) work for Birmingham City Council identified the importance of a strategy for roads to give due priority for pedestrians and cyclists, and shopping and leisure activities. These ideas are incorporated insofar as the relevant activities exist in the study section. Some of the measures rise in any case from the speed reducing techniques of traffic calming.

Particular attention needs to be made to ensure measures are to the standard required by a Heritage Area.

Views of the Local Community

The feasibility study does not include any consultations with the local community, statutory bodies and interested bodies; these consultations would take place at a later date. Instead the County Council has provided some indication of relevant local views.

Timescale

There may be alternative calming measures with different timescales attached to their implementation. Some measures may require land acquisition or service diversions which can cause delays. For example, an alternative to a right-turn pocket at the Whinwhistle Road junction would be a roundabout, as being considered by the County Council in a separate study. These proposals have land acquisition implications.

Consideration has therefore been given to alternative treatments of the same section, so that some immediate action can be taken whilst reserving the main thrust to a longer term measure.

Speed Enforcement Cameras

The scope for use of enforcement cameras is considered on the basis of discussion with the County Police and other information. Police staff resource is a constraint and demands that cameras be provided force-wide in the most effective manner.

General

For this report plans are provided at appropriate scales, usually related to the background plans provided by Hampshire County Council. Several measures are shown on a key location plan basis at 1:20,000, which is convenient for the report format. Some specific measures are indicated at 1:2500, comment has been made on a junction design by modifying a 1:500 plan, and sketches of innovatory measures are shown at further enlargement. The translation of these ideas into detailed drawings is expected to follow later in this year.

Costs of the measures have not at this stage been estimated. The report concludes that worthwhile measures will require some new carriageway provision, possibly outside the current highway boundary. This will inevitably increases costs and timescales, depending on the existing of underground plant and the attitudes of frontagers.

3 Data Collection and Immediate Conclusions

3.1 Site Visits

Three independent site visits have been carried out to evaluate the situation. These have included motoring the entire length from Southampton to Salisbury, repeated traversing of the route, viewing of the nearest parallel route, creation of a personal audio commentary, walking of several sections and photography of significant features. They have not included a continuous video record, a comprehensive inventory or a formal walk of the whole study section. These are available in the accident report.

The study section was found to comprise a generally straight single carriageway, with occasional bends and undulations impairing forward visibility. Limited sections were found to have frontage development, often set well back. There was generally limited space for right turning traffic, so that through traffic had to stop and wait. Outside the study area, A36 was found to be generally wider, straighter and flatter. The implications of these findings are discussed more fully in the next chapter.

The road is generally about 7m wide. It is unlit except at the junctions at Ower, Whinwhistle Road and Canada Road.

3.2 Reported Injury Accidents

The previous road safety study already has 36 months accident data for the part of the study area within Hampshire. This was presented in the form of stick diagrams and location of the accident on a key plan.

Accident printout has been provided by HCC for its section of road for a further period of 14 months. Accident printout has been provided by Wiltshire County Council for its section for the latest available period of 42 months.

This data has been reviewed and presented as tabular stick diagrams in Tables A and B. The accidents are numbered in the order of the printouts but presented in geographical order to facilitate referencing them to the road. The data has also been combined with the earlier data and presented on a single 1:20000 plan in Figure 3.1 covering the entire study area. This permits an impression to be obtained of the concentrations of accidents.

Four sections of interest can be identified, including the main clusters of accidents:

- The Wiltshire section crossing the bridge to the Shoe Inn;
- West Wellow centred on the Red Rover;

- A series of side turnings from Bellevue garage to Whinwhistle Road; and

- Side turnings near Shelley Lane.

Later in this report the idea will be developed that the first three of these sections would benefit from a form of traffic calming as opposed to a localised AIP treatment. There are however variants on this theme and either approach may have application to these sections or to some other isolated situations.

Figure 3.1 has classified the accidents in a form similar to that of the previous report. It is found that the majority are related to the presence of stopped or turning traffic. Sometimes the stopped traffic is caused by temporary traffic controls but at other times it may be attributed to right turning traffic further ahead causing temporary traffic queues. Although the contributory factors may variously refer to excessive speed, misjudging clearances or travelling too close, the underlying problem is clearly the interaction of heavy traffic having an expectation of high speed on a narrow road with significant turning traffic.

3.3 Traffic Flows

The traffic flows which are available cover:

- Classified turning flows at Slab Lane (May 1990);

- Classified automatic A36 traffic counts at Canada Road roundabout (July 1994);

- Classified manual A36 traffic counts at Canada Road roundabout (September 1993); and

- Partly classified peak hour turning count at Whinwhistle Road (authorisation June 1994).

Traffic counts have been received from Wiltshire County Council, but these are too far west or at junctions off the A36 for them to be of direct relevance to this study.

The Whinwhistle Road count is reproduced as Figure 3.2 since it concisely tells most of the story.

The key finding is that hourly traffic flows are already up to 900vph. Taking account of road improvements and underlying growth, flows are likely to rise to match the capacity of a single lane, taking into account the existence of many accesses having no specific provision for the right turning traffic. The presence of a high proportion of HGVs, up to 7.3% in the peak direction (from Salisbury) in the AM peak increases the

impact of the traffic flow, when expressed in passenger car units and provides variation in desired traffic speeds in the traffic stream.

The heaviest turning movement at Whinwhistle Road is to and from the Southampton direction. The AM and PM flows are similar indicating that traffic is not greatly deterred from making the right turn into Whinwhistle Road, which has been found to be related to tail-end collisions (see Figure 3.1). The turn towards Salisbury is lighter and unbalanced between AM and PM suggesting that up to 30vph may be deterred from emerging from Whinwhistle Road to turn right, and may appear at other junctions.

The various counts west of Canada Road generally have significantly lower traffic flows. In view of the absence of major destinations between Whinwhistle Road and these sites, it is probable that some adjustment of the figures would be appropriate. The flows in Slab Lane are under half of those in Whinwhistle Road. Further counts at sites such as New Road, Sherfield English Road, Canada Road and Maury's Lane would be useful to form a better picture of traffic movements.

It is concluded that any measures must reduce conflicts for the through traffic, so that the unsafe action of stopping a continuous traffic stream is attempted as rarely as possible. It is also concluded that the turning traffic has not been unduly diverted from carrying out difficult and potentially dangerous right turns.

3.4 Speed Surveys

As part of the accident study, speed surveys were carried out at several points along the road. Broadly these established that the 85%-ile speeds were within 6mph of the posted speed limit and were therefore as low as could be expected in accordance with the formal guidelines. This is valuable as indicating that relatively minor traffic calming techniques would be able to bring all 85%-ile speeds within this acceptable range. It also offers the prospect that somewhat more extensive measures would be able to achieve speeds appropriate to a lower posted limit of 40mph.

A further survey was commissioned by HCC, carried out on 19 July 1994, in the dip east of Whinwhistle Road. The 85%-ile speeds of 45-49mph recorded in this 50mph limit zone must be regarded as remarkably low. If properly carried out none of the recorded vehicles would have been subject to any influence from other vehicles which might cause them to have a speed other than the desired speed of the driver ie no cars would be closely following slow HGVs and traffic queues, or the anticipation of queues at the Whinwhistle turning, would not be influencing speed.

It has therefore to be concluded that speeds higher than the posted limit are not a problem. This still allows for accidents to be caused by speeds

inappropriate to the conditions, particularly low stopping sight distances such as those at the undulations. It is therefore incumbent on the highway authority to notify drivers of those conditions which would justify speed reduction. This report goes further in suggesting that the highway authority should ensure that the character of the road as perceived by drivers should be appropriate, and that it cannot rely only on signs.

4 Philosophy of Approach for Traffic Calming

Traditional concepts of the design of rural main roads have been concerned with the provision or maintenance of capacity for through traffic, and accident reduction. The basic tenets of design have been that roads should be straight rather than bent, flat rather than hilly, and wide rather than narrow. Warnings of hazards and encouragements to drivers to drive slowly at hazardous locations have relied heavily on signs rather than road or landscape design. This allows a high speed to be maintained, and/or for the adverse safety consequences of speed to be minimised. Such an approach is still unchallenged where the road's sole function is the passage of through motor traffic.

This approach characterises much of the existing A36T between Ower and Salisbury, and particularly the Wiltshire section North West of the study boundary.

Traffic Calming is not a replacement philosophy, but addresses design issues where there are conflicts between through traffic and other functions. This applies where development or activities occur on one or both sides of the through road, or where there are intersections with other roads serving localities on either side of the main road.

Such conflicts include through traffic with:

- Local access (including parking, turning traffic)
- Locally generated movement (especially ped/cycle movements)
- Bus movements and stops
- Environmental quality for residents/others
- Environmental quality for others (e.g. "view from the road" and "view of the road"). This is especially important in areas of landscape importance such as the New Forest.

The traffic calming approach is in many ways the obverse of the general approach for through roads, namely: designing the road to improve safety by reducing the speed of traffic rather than building-in margins of safety for "high" speed. Although this approach has not generally been applied for speed management purposes on "the open road", there is no technical reason why it should not be so applied. The basis of speed management (in practice the reduction of speeds below current levels) is that the driver is presented with a view and knowledge of the road ahead which persuades him or her to slow down, or not to speed up. Whether the measures used are "physical" like humps, or "visual" like gateways does not alter the fact that speed reduction in both cases results from the psychological process of drivers action on sensory information.

The A36 study section is not an "open road" on which through traffic is given unfettered priority. On the other hand it is not a road passing through a distinct or strongly-developed urban settlement. Its character lies

between the two, and this calls for some care and perhaps innovation in the resolution of its safety and other problems.

The study section has some, but not all the attributes of a village through road, in summary:

No - Pedestrian generating activity on both sides
No - Frontage development on both sides
No - Frequent pedestrian cross-flows or desires
No - Major traffic-generating activities other than residential areas of Wellow on north side

Yes - Accesses at frequent intervals (most private and infrequently used during the day)
Yes - Side roads giving access to residential and other development
Yes - Wooded and rural appearance
Yes - Pedestrian and cycle activity over parts of road
Yes - Bus stops (hourly service each direction).

Figure 4.1 shows the road with the various sections of development highlighted. This shows that they do not form a tight area through which the road passes, but rather a series of appendages to one side or the other. It is presumably this feature which causes the lack of local activity crossing the road. The same feature is illustrated diagrammatically in Figure 4.2, which demonstrates how the study section differs significantly from those described in the next chapter on which there is the greatest amount of existing experience.

(Fig 4.1 not available in this document)

5 Analysis of Conflicts and Issues

Speed is seen as the main issue for the A36. In view of the survey information this must be interpreted in terms of behavioural issues normally associated with speed. The study section is mostly posted with a 50mph limit. This may be regarded as reasonable by drivers in good weather and light conditions, especially as the section lies between other de-restricted road sections which have higher design speeds. However, 50mph is too fast given the limited dimensions of the study section, the frequency of potential hazards, and the poor visibility resulting from undulations. Fifty miles per hour is also too fast from the viewpoint of vulnerable road users and bus operators.

Speed is an issue from viewpoints:

a) Some locations are sensitive to speed because of turning movements (risk of shunts/side impacts);

b) Some sections are sensitive because of noise from fast traffic;

c) Some sections/locations are sensitive because of pedestrian/cycle activity.

The road undulations problem applies only to the study section of the A36. Our impression is that drivers are tempted to speed on account of the long views ahead, and insufficient attention being paid to the short-view restrictions on visibility brought about by the undulations. The zone subject to undulations is also shown on Figure 4.1.

The undulations cause problems in certain circumstances, not for all drivers all of the time. For example, a lorry driver can see cars in the hollow ahead, where a car driver cannot. The visibility is in almost all locations restricted only in relation to prevailing vehicle speeds. If all vehicles travelled at 30mph, the visibility would be satisfactory. One problem is that the driver has no control over the speed of oncoming vehicles. It is also difficult for a driver to travel more slowly than a following driver wishes.

Similar considerations apply to turning movements. Drivers wish to maintain the 50mph maximum as if it were also a minimum, and are not always tolerant of drivers slowing down to turn, especially if they are looking for the turning point. [A relevant issue here is the poor signing of accesses and turns, and the poor design of the turns themselves.] At slower prevailing speeds, the conflict with turning vehicles would be much less of a problem.

Noise is likely to be a significant problem for people living alongside or near the A36. Slower speeds would reduce noise levels, provided that the slower speeds were not accompanied by increased amounts of acceleration and deceleration.

Conflicts between through traffic and crossing traffic are spread along the study section. There are no locations where pedestrian crossing movements are intensive. Vehicle crossing movements are also not concentrated except at Canada Road, where the roundabout caters for this adequately. This is also the location of the only concentration of shops (Lower Common Road near A36 roundabout, 4 shops plus Post Office/greengrocer on A36 itself).

Landscape is an important consideration on the A36. The study section still has the character of a rural road, partly because of the numerous mature trees and other greenery close to the road. In places the tree canopies link across the road, creating a pleasing "tunnel" or avenue effect. Major re-modelling of the road which involved widening would result in a major change of character. The road is adjacent to the New Forest National Park at two sections, also shown on Figure 4.1.

Pedestrians are reasonably provided for with the north side footpath west of Whinwhistle Road, except where this is discontinuous near the County boundary. There are no locations where pedestrian activity is particularly intense, either alongside the road or across it. Nevertheless, there is pedestrian activity at peak times and school times, especially in Wellow itself. The proximity of fast-moving traffic, especially HGVs makes walking along the A36 an unpleasant and sometimes intimidating experience. Some of the side roads have no footpath provision.

Cyclists are found in two categories: touring cyclists using the A36 as a through route, and local cyclists using or crossing the A36 as part of a local journey. Both by survey and observation few cyclists use the A36. The few number of cyclists on the A36 is not necessarily a reflection of demand. The road is extremely dangerous for cyclists with no provision or protection whatsoever, either along the road or crossing it. A cyclist is unable to cycle safely on the A36, having no control over the speed or behaviour of drivers. There is mostly insufficient width to allow two HGVs and a cyclist to pass, certainly not at speeds above about 20mph. In the vicinity of Whinwhistle Road cyclists use devious manoeuvres to avoid traffic, including using the footway west of that point.

6 Experience From Other Countries

6.1 Introduction

The earliest traffic calming work on through roads followed on from experience in residential areas, and urban main roads. In almost all cases, however, the experience has been with roads passing through fairly distinct settlements, and/or with roads carrying much lower traffic volumes than the A36.

Comments from French, Dutch and German specialists suggests around 10,000 vpd as the maximum flow which can co-habit with village life. We would dispute this, as the Borehamwood (Hertfordshire) scheme functions well with 18,000 vpd.

Another common thread in Continental practice is that traffic calming tends to be limited to relatively short sections of through road, ie up to 1km length. The principle here seems to be that drivers are prepared to slow for a while, but may become impatient if slow speed is expected for too long.

Nevertheless, continental experience of through road design and the impact of speed reduction measures is relevant. One important common theme in all of the work is the reluctance on through roads to introduce vertical shifts. The Borehamwood scheme referred to above is one of the few examples. Most continental experience is with carriageway narrowing, lateral shifts, optical measures including tree planting and optical brakes, and gateways. Traffic lights, VMSs to indicate excessive speed and cameras are also being used, but the UK probably has as much experience in this field.

6.2 Germany

The State of Northrhine-Westfalia carried out through road projects in 28 villages during the 1980s. These were the subject of detailed research commissioned by the State and the Federal Institute for roads.

All but one of these projects avoided vertical shifts. The measures used varied but included a mix of gateways, lateral shifts, carriageway dividers, side or centre paved strips, visual and rumble devices, surface and colour changes, and electronic signs.

The measures mostly were not bold enough to produce more than marginal reductions of speed. However, where "deep" lateral shifts were introduced, speed reductions of about 10mph were achieved. Research showed positive (though not necessarily statistically significant) outcomes for accidents, and popularity of the schemes with both villagers and drivers. Noise reductions were achieved, even where textured paving was introduced.

Important lessons learnt were that gateway measures have no more than a localised effect on speeds, and that the distance between measures is important. British results from VISP have mostly duplicated the German experience.

6.3 Denmark

The Vinderup through road study is well known. Again no vertical shifts were used, but fairly effective lateral shifts, carriageway dividers etc. The intensity of village activity in Vinderup makes it less relevant for the A36,

but what is interesting is the apparent popularity of speed reduction measures with drivers.

A through road in Skaegkaer (6,000 vpd) uses dividing strip paved in granite setts, with divider islands at gateway points and turns. The speed limit was reduced from 60kph to 50kph, but speeds were reduced only from 63 to 59kph. However, the proportion of vehicles exceeding 70kph was reduced from 26% to 14%.

6.4 Netherlands

There have been some locally-undertaken schemes, but not much on heavily trafficked through roads in rural areas and not much research data. Carriageways are often narrower than in Britain (6m not uncommon on through roads), but separate cycle paths are expected.

6.5 France

Unlike the other countries, perhaps most French traffic calming experience has been with through roads. This arises from the size of the country, the rural nature of the population distribution outside Paris, the thousands of villages lying astride through roads (Routes Nationales or Departmental roads), and the rarity of by-passes due to the imperative of keeping long distance traffic on the tolled autoroutes. Of particular interest are the 50 National demonstration projects in the 1980s and associated research. Some of these projects were on Routes Nationales carrying flows up to 25,000 vpd.

Two projects which have similarities with the A36 are Doyet and Golancourt. Doyet used side strips in lighter coloured surface material to reduce the width of the main carriageway, also carriageway dividers in the built-up parts. Golancourt used central islands to create lateral shifts.

The French have been much more willing than other nations to introduce vertical shifts on through roads. Roundabouts have also rapidly become a common feature (a British export!). One example is St Andre near the Spanish border which has a roundabout to mark the entrance to the village, narrowed carriageway to protect an avenue of ancient trees, and vertical shifts within the main part of the village. The sequence of measures, becoming progressively more speed-controlling as one approaches the heart of the village, is effective.

As in the other countries, the measures have often been welcomed by drivers as well as villagers. This may reflect the acceptance of speed cameras in France in that many drivers like to be able to drive at moderate speed without being intimidated by more aggressive drivers (sounding horn, following too close, flashing lights etc). The presence of physical or other speed enforcement measures reduces the scope for such intimidation.

7 VISP and Its Applicability

7.1 The Study and its Reporting

The VIllage SPeed Control Working Group's study was announced in July 1991 by the Department of Transport in conjunction with the County Surveyors' Society. Twenty-four schemes were monitored covering a range of village sizes (in terms of population) road status and traffic level. These have been reported formally in:

- VISP - A summary; Traffic Advisory Leaflet 1/94;
- Village Speed Control Working Group Final Report; and
- Speed reduction in 24 villages: details from the VISP study; TRL Project Report 85, 1994.

Subsequent comment on the study has concentrated on the relationship between spending and the results achieved. Spending was in any case never high, the most expensive set of treatments amounting to £63,000. It is felt that the results achieved largely reflected the amount that could be spent.

The summaries indicate that the attainable speed reduction depends on whether measures are applied only at the terminal (gateway) sites, within the village or both. Depending on the significance of the treatments, gateways alone produced speed reductions of 3-7mph at the gateway and up to 3mph in the villages. For schemes relying entirely on treatments within the villages reductions were under 3mph; indeed a single pelican crossing site experienced an increased speed of this amount. With measures within the village and at the gateway speed reductions of 9-12mph were obtained.

Probing further into the VISP report itself and restricting one's attention to Trunk Roads the picture is less encouraging. Reductions at the gateway and within the village are of the order of 3mph with extremes of an increase of this amount and reductions of up to 7mph in the vicinity of the gateway for Grimond and Sanquhar.

The study reporting classified the sites according to the priority of road (for which the top category was A/Trunk), traffic flow (for which the top category of over 8000vpd is relevant to A36) and for village size, judged by population. This sizing is however of limited relevance to Wellow which as already shown has much of its population in pockets off to one side of the road.

A better guide to size, at least as perceived by motorists, would be the length of the road subject to different conditions. The VISP reporting is surprisingly silent on this. In effect the schemes seem to be of the order

of 1km. This compares with the 3.8km length of A36 currently restricted to 50mph.

A further guide to the likely acceptance of measures by motorists is given by the speed limit applicable to the study section. Most of them are subject to 30mph limits, with 6 having 40mph sections and one at 60mph. Since these posted limits reflect a degree of consensus between the aspirations of the villagers, the tolerance of the motorists and the enforcement capability of the police, they reflect a real difference in characteristics between the VISP study sites and A36.

7.2 VISP Lessons for A36

On the A36 it is considered that a correct reaction to the current problems would require a speed limit reduction to no more than 40mph. For the associated actual (85%-ile) speed reductions to be achieved would therefore require measures of the most extreme type tested in VISP and then not on high flow trunk roads. In particular physical measures incorporating a degree of visual impact would be essential.

The length of A36 under study is several times longer than the VISP study villages. It is therefore questionable whether the techniques are likely to achieve success over such a long length within which drivers would be acclimatised to the visual impact. There is therefore a case for considering a variety of treatment, with the greater impact being concentrated on those sections where it is most needed.

8 Scheme Options for Consideration

8.1 Basis of Selection

The background evidence so far presented indicates that stark decisions must be made on the length of A36 to be subjected to traffic calming and the extent of the measures to be applied. Figure 8.1, although reflecting one of the more severe possible treatments, may be used as a reference, and drawings 02/C/2850/03 to 08 show at 1:2500 scale how these measures might be achieved.

Regarding the length of section for treatment, the measures in this chapter identify possible gateway sites. At the extremities these approximate to the existing 50mph speed limit limits being displaced slightly westwards in both cases: at the west end to incorporate the turning of Giles Lane, and at the east end to be closer and more relevant to the Whinwhistle Road junction.

A shorter core section has been identified between School road and Maury's Lane. This amounts to 1.2km, which is therefore of the order of the sections in the VISP study although appearing rather short in the Wellow context. A further spot potential gateway has been identified at the county boundary where the natural road narrowing can be used to incorporate village name signing and speed limit confirmation.

Within the core section, the lowest applicable speed limit might be applied of 30mph or 40mph. It would be supplemented by extensive physical measures comprising turning pockets with speed restricting physical features, narrowing of the obvious carriageway and provision of alternative surfacing for over-running by large vehicles.

Outside the core section, some of the presented options offer a similar treatment. Alternatively it is suggested that only very limited traffic calming should be applied; the main emphasis might then be on improving the road in the traditional sense to match the appearance and traffic performance of the adjoining sections of A36. Specific treatments would then be used to deal with the accident problems; these would include turning pockets with limited widening and roundabouts.

The presentation in this chapter commences with a discussion of the opportunities for on-line major improvements and then covers traffic calming strategies broadly in the order of severity of treatment. The least severe calming strategy is based on the limited visual treatments in VISP and the most severe is an end-to-end treatment which would certainly reduce the speed along the road.

For none of these treatments would one expect any significant traffic diversion. Even the most severe treatment would still preserve speeds of 30mph to 40mph which exceeds what could conveniently be achieved on the alternative road with sharp bends incorporating Maury's Lane and Romsey Road. Specific improvements to right turning facilities from

Whinwhistle Road into A36 would probably allow some traffic (not exceeding 30vph) to re-route onto A36 from the alternative route. Further afield there is relatively little competition for the direct route which A36 provides between Southampton and Salisbury, and this directness has been emphasised over the years by road improvements in Wiltshire and now by the Totton western bypass.

8.2 On-line Major Improvement

Such an improvement would raise the standard of the road to at least match the requirements of a 50mph design speed. At the eastern end this would include widening and turning pockets at Shelley's Lane, at least to the extent shown on the appended drawing. Where there are significant activities and side turnings as at Fighting Cocks Farm the road should be widened to wide single carriageway standard and a combined footway/cycleway provided on the north side. Long (50m) laybys should be provided at all bus stops.

At Whinwhistle Road a major junction improvement would be provided. If this took the form of a roundabout, it would require adjustment as in Drawing 02/C/2850/01 to ensure that the entry from Whinwhistle Road was safe. The alternative signalled junction could also be applied but would be expected to have a higher incidence of accidents. Levels would be adjusted to provide an 85kph stopping distance which would involve eliminating the dip east of Whinwhistle Road.

Further west the road would be widened to at least provide a wide single carriageway, having a carriageway of at least 10m wide, marked with appropriate marginal strips. There would be a combined footway/cycleway on the north side. All bus stops would have long (50m) laybys. At the sites indicated on the appended drawings some additional widening would be required to provide protected right turn pockets. Throughout this section a thorough review of vertical alignment and associated stopping sight distances would be required with the likelihood of some adjustments. For School Road junction it would probably still be appropriate to ban the right turn from A36 in which case this should be enforced by a marginal strip amounting to a limited section of dual carriageway; in such a section the carriageway width in each direction should not exceed that required by a single lane of traffic.

The shops and turning to Slab Lane should have a redesigned carriageway incorporating an extended layby or service road. The Red Rover car park should have a turning pocket and the nearby bend should be realigned to provide the required sight lines.

Continuing west the wide single carriageway should have further widening and turning pockets for both sides of the road at Plaitford Village Hall and again across the county boundary starting at the Shoe Inn, as indicated on the appended drawings.

In this option it is not clear whether any further treatment is required for New Road junction, although the potential for misunderstanding the informatory one-way traffic sign in New Road itself should be addressed. The required junction design should depend on the turning traffic levels, which currently appear to be small. It is certainly necessary to address the Giles Lane turning with a protected right turning pocket and perhaps a deceleration lane from the west. The speed limit sign should be moved to cover this turning.

Clearly these measures would be relatively expensive. For some of the route the existing highway boundary provides a width of up to 15m which might just be adequate. However, at narrower points, or where the adjustments to vertical alignment required sections of cut and fill property acquisition would be necessary.

8.3 Traffic Calming Along VISP Lines

Such a technique would not be expected to produce speed reductions exceeding 5mph, which would limit the scope for changing the posted limit. It would be based on providing gateways with greater visual impact, all the relevant AIP measures including turning pockets with physical protection and deflection and intermediate gateway treatments. Laybys should be provided at all bus stops.

Immediately east of Whinwhistle Road there would be a gateway treatment. This would as a minimum incorporate a 50mph sign on a rectangular (yellow) board surmounting a village name (and twin) sign. Its location would depend on the extent to which the junction was displaced from its present position. If the junction is not displaced, then the sign should be located west of its current position, moved into the dip. A carriageway marking gateway should be incorporated, possibly the "dragons' teeth" which proved successful at the somewhat similar Crimond site in VISP.

At Whinwhistle Road a junction improvement would be provided. If this took the form of a roundabout, it would require minimum adjustment as in Drawing 02/C/2850/01 to ensure that the entry from Whinwhistle Road was safe. The design would preferably be reduced further with the entries reduced to single lanes with high profile demarcation; the additional space necessary to provide for the swept paths of large vehicles would be obtained with over-run areas. It should for example be possible to achieve such a design with a central island of internal diameter no more than half the 31m currently proposed. This would be consistent with the location of the roundabout within a 50mph limit.

The alternative signalled junction could also be applied but would be expected to have a higher incidence of accidents. Should the minimum improvement of a protected right turning pocket be adopted this should be modified along the lines of drawing 02/C/2850/02 so as to increase

the degree of carriageway deflection for inbound (NWbound) through traffic.

Further west, at the sites indicated on the appended drawings some additional widening would be required to provide protected right turn pockets.

Approaching School Road junction there should be a further gateway treatment, repeating the speed limit or, if that is the chosen option, reducing it to 40mph. It would be appropriate to continue to ban the right turn from A36. If possible this should be enforced by a marginal strip amounting to a limited section of dual carriageway; in such a section the carriageway width in each direction should not exceed that required by a single lane of traffic, which would to some extent help in avoiding property acquisition.

Ideally the Canada Road roundabout should be reduced to single lane entries with over-run strips and a smaller central island. The substantial space available to it means that good deflections would continue to be possible. A greater proportion of the adjoining space and the central island should be planted, generally with shrubs or trees which break up the forward view, but with low-growing shrubs where it is essential to retain intervisibility at drivers' eye height (1.05m).

The turning to Slab Lane and the Red Rover car park should have integrated turning pockets. For westbound traffic they should incorporate a carriageway speed repeater eg a roundel in a background patch.

The Red Rover bend should have the improved chevron signing as shown on the appended drawings. West of it, eastbound traffic should be presented with a speed limit reminder on the carriageway as a roundel in a background patch. West of Maury's Lane there should also be a speed limit reminder which should be incorporated in a further gateway treatment. This would be particularly applicable if the speed limit here changed (in this alternative it would be 50mph west of this point).

Continuing west there would be turning pockets for both sides of the road at Plaitford Village Hall and again across the county boundary starting at the Shoe Inn, as indicated on the appended drawings.

In this option there would be no specific treatment for New Road junction, although the potential for misunderstanding the informatory one-way traffic sign in New Road itself should be addressed. It is certainly necessary to address the Giles Lane turning with a protected right turning pocket. The speed limit sign should be moved to cover this turning, and converted into a gateway eg of the "dragons' teeth" style.

Few of these measures would be particularly expensive, with the exception of a possible new junction at Whinwhistle Road. For much of the route the existing highway boundary provides a width of up to 15m which would be adequate. There would be a need to review the presence of underground services to see whether they could be given sufficient protection without the expense of re-routeing.

Since the existing speeds are already within the range expected for a 50mph speed limit, it is possible that this treatment would create sufficient speed reduction to permit the introduction of a 40mph limit for some or all of the section. In particular it would be expected that a 40mph limit could be introduced between School Road and Maury's Lane. If it is proposed to lower the speed limit of the entire section from Whinwhistle Road to Giles Lane, it would be necessary to increase enforcement attention, including the provision of speed cameras at the more critical intermediate sites eg in the vicinity of Blackhills Road and Plaitford Village Hall.

8.4 Intensive Core Section Treatment

This alternative would include a very obvious change of character in the core section, currently proposed as being between School Road and Maury's Lane. The principles of design of this treatment are described and illustrated in the next section where they are applied more extensively.

Within the 40mph core section the running lanes would never exceed 3m in width and would be reduced to 2.5m or 2.75m at pinch points where turning pockets or bus laybys were being provided without property acquisition. Additional space would be provided for wider vehicles with over-run areas on the near-side. There would be a continuous median strip of at least 1m constructed as an over-run area, except where it was replaced with physical protection of the right-turning pockets and the possible physical banning of the right turns into and out of School Road. On the northeast side of the road there would be a continuous 2m wide combined footway and cycleway.

The cost of this treatment, whilst avoiding the expense of significant property acquisition, is substantially increased by the need to provide distinctive surfacing for the extensive over-run areas. Ideally this should be blockwork, but cheaper alternatives might be achievable with raised thermoplastic treatments.

8.5 Ultimate Traffic Calming

This includes a variety of measures within an overall approach. Some of the suggestions could be dropped or modified without changing the overall approach. For this reason, the overall approach is dealt with first, followed by a range of "bullet point" measures and ideas.

Overall Approach

The overall approach is:

- To reduce the speed of vehicles on the study section to reduce their adverse impact on safety and the environment;
- To achieve speed reduction by physical measures which convey to drivers the necessity for slower driving through the sensitive sections;
- To reinforce the intended maximum speeds with lower legal limits (40 and 30mph);
- To mark the beginnings of the lower-speed section(s) with "gateways" to gain the attention of drivers, and subsequently introduce progressively "tougher" measures to ensure the desired speed and behaviour;
- To incorporate within the scheme specific measures to tackle the most prevalent type of accident, namely shunts due to the presence of turning vehicles in the main through traffic stream; and
- To ensure as far as possible that traffic is smooth-flowing, albeit at lower speeds, in order to minimise the fumes and noise associated with acceleration and deceleration.

In relation to turning pockets there is a potential conflict between measures to get turning vehicles out of the traffic stream, and the desire for lower speeds. If speeds are low, then the dangers from turning are greatly reduced. This means that the crucial decisions may be about the New Road and Whinwhistle Road junctions, and whether or not they have turning pocket designs or roundabouts.

8.6 Specific Measures for Ultimate Traffic Calming

Re-Profiling of A36

Narrowed carriageway(s) over the entire speed-restricted section, as shown in Figure 8.1. Maximum width to be 2 times 3m. Minimum width to be 2 times 2.5m.

Side strips and a central strip to be provided throughout, bringing the overall width available for vehicles (2 way) to at least 7m, and up to 9m. These strips to be rough-textured to deter use by vehicles, but they can be driven over. They allow occasional use by HGVs and other large vehicles, but cars can avoid driving on them by making tighter turns (at lower speeds).

The definition of main "smooth" carriageways of limited width, while providing room for manoeuvre, allows much tighter dimensions at bends and

junctions, thus leading to reduced vehicle speeds. It is thus a design which discriminates between cars and large vehicles, and overcomes the problem of "general purpose" lane widths which encourage speeding by smaller vehicles (cars).

Although lower speeds would help cyclists, the narrow carriageway scheme will be hazardous for cyclists. Consequently, cyclists will be allowed shared use of the existing (though widened) footway and a new shared foot/cycle path provided east of Whinwhistle Road, and west of the county boundary.

A 1m (minimum) green strip will be retained adjacent to the highway boundary to allow space for plants, drains, culverts, access visibility etc.

This design assumes the availability of 13m between highway boundaries throughout, or at least for the section treated with this approach. From the OS plan deficiencies are evident at the Shoe Inn, at the Red Rover, at Palmer's Bridge and at Fighting Cocks Farm; this needs checking by survey.

Carriageway Dividers

Apart from the continuous division described above, dividers of greater prominence as shown in Figure 8.2 should be provided at all road junctions, and at the more important private accesses (eg petrol stations, nurseries). These dividers or islands should be planted. Where there is at least 2m width available, planting could include trees. Shrubs should be low-growing to maintain visibility.

These dividers will become prominent features along the road which clearly indicate to drivers that "things are happening" and that care and consideration is necessary for other road users in the locality. The road over the sensitive section is thus transformed from "an open road with hazards in it" to "a rural community through which one is allowed to pass". The overall impact is indicated in Figure 8.3.

Kerbing should respect the rural character of the road, and could be less formal than standard concrete upstands.

The dividers will protect turning pockets. They can be marked and illuminated at night with beacons, as at Maury's Lane, but the departure from the rural character of the road should be considered.

Dividers can be designed in association with re-profiling of the carriageway to introduce lateral shifts. That is, they have strips around them which can be driven over, allowing access for large vehicles, but encouraging small vehicles to turn slowly to avoid driving over them. The dividers can thus act as speed limiters in the main flow as well as protectors of turning vehicles and crossing pedestrians.

Gateways

At least two gateways are needed, one at each end of the scheme. As visual markers they should clearly be the beginning of the changed road character, ie the road should not continue beyond the gateway as before. The suggested locations are Giles Lane and somewhere east of but close to Whinwhistle Road. The re-profiled road should be between the two gateways.

The Gateways should include prominent dividers, new and existing trees, and speed limit signs. Preferably they should be over a short stretch of road (eg 40m) to create a visual "event" rather than visual "moment".

The main gateways will be supplemented with other locations where a "gateway-like" treatment can be given to help speed reduction at the approaches to junctions.

Roundabouts

At least two locations are being considered for new roundabouts, Whinwhistle Road and New Road.

New Road is the more suitable site, to the extent that the existing widening provides some space which may be adjustable to accommodate a roundabout within highway limits. Also the junction is at a bend on the brow of a slight hill, and the potential speed reduction will be of great value. Against this it would not be solving the demonstrated turning traffic problem evident at Whinwhistle Road.

The design should, however, have single lane entries, not two lane.

Whinwhistle Road could be suitable from a functional viewpoint, but will involve land purchase and the loss of a number of mature trees. It is suggested that re-profiling and approach speed-limiters could avoid the need for a roundabout. In any case, it should be single lane entry if good speed reduction is to be achieved.

Canada Road roundabout should be modified to single-lane entry as part of the re-profiling.

Landscape

Both hard and soft landscaping should enhance the character of the road.

Black-top will continue for the main carriageway, but a new material is needed for the side and centre strips. Brick is the usual building material locally, and a suitable type should be found with colouring that is subdued but noticeably different from black-top both at night and in daylight.

Kerbing of dividers etc should be done in natural stone rather than standard concrete. Vertical upstands should be avoided to create a softer

appearance more in keeping with a rural character, and allow for overtaking of broken-down vehicles.

Much of the study section of the A36 has mature trees and shrubs close to the highway boundary. This has a positive effect for limiting speeds and should be maintained. New planting can be introduced in order to further reduce the "optical width". This should be done wherever carriageway dividers are used, though trees (rather than low shrubs) should only be planted where there is sufficient space for the tree to grow without interfering with vehicles (about 2m is usually sufficient). The type of tree to be planted should be determined by the growing habit desired as well as by aesthetic considerations. The New Forest has a wide variety of species, and no single species appears to be predominant. The further views of conservation officers and landscape specialists should be sought on this issue.

Road Closures

Opportunities for resolving some conflicts by closing accesses to the A36 were considered, especially Slab Lane. However, this would cause inconvenience for residents, and would work counter to the desired speed reduction in this section.

Bus Stops

There is the possibility of using bus stops as speed reducing features if stops are located on the main carriageway, and overtaking of buses prevented by carriageway dividers. This idea was rejected because buses are infrequent (hourly), and stopped buses would interrupt the flow of traffic, the smooth running of which is one of the aims of the scheme.

However, bus laybys can double as left-turn lanes. This is already done at one or two locations. Consideration might be given at other left turn locations (eg eastbound at Red Rover car park, Slab Lane).

Journey Times

A reduction of speeds from 50mph (present average) to 40mph will result in about an extra 0.6 minute of journey time over the section with a reduced limit. Removal of right turn friction is, however, likely to increase the reliability of the journey time. Reduced variation of vehicle speeds may also in practice mean no increase in journey time.

Signs

Present signing has been the product (apparently) of ad-hoc responses to problems over time. The placing of warning signs and markings is perhaps related to existing speeds, but will certainly be inappropriate for the lower speeds now intended as the distance from sign to hazard should be shorter at lower speed.

Direction signs should be placed so that drivers are 100% clear where the turning point is, at night as well as in daylight. At present it is not always clear. Plaitford Village Hall is a good (or rather bad) example of this.

All signing should be reviewed as part of the overall design. The aim should be to achieve the intended speeds and behaviour through the design of the road rather than the use of signs.

"Patience" Signs

In Provence (France) there are experiments with novel signs designed to directly address the driver. "Bend ahead" assumes the driver knows the appropriate action to take(!), but may lose the instinctive appeal of a symbolic sign or chevrons on the actual bend. One innovative example was the use of "Patience" signs. Translated to the A36 these would say:

"PATIENCE: in 20 minutes you will reach Salisbury", or
"PATIENCE: in 10 minutes you will reach the M27".

Electronic Signs and Speed Cameras

Variable limit signs, interactive signs and similar measures are not obviously appropriate. These tend to be most effective for speed reduction at specific locations where pedestrian activity is intense, and there are no such locations within the study area. Speed cameras could be deployed, but necessity for them will indicate a failure of the scheme design.

Cycle Path

The proposed shared cycle/footpath should be wider than the present footpath, and a width of 2m is recommended. The path would be at footway height above the carriageway. The path should be marked with signs which indicate that pedestrians have priority over cyclists (ie the person logo is placed above the cycle logo on the circular blue sign). The path would be able to handle much higher pedestrian and cycle flows than exist at present, but provision of the path is likely to generate extra use.

Both pedestrians and cyclists would have to give way at side-roads, but not at other cross-overs. Consultation with the owners of property next to the path will therefore be desirable.

Pedestrian Crossing Facilities

There appears to be no real case for formal pedestrian crossings. However, the provision of carriageway dividers at junctions and other locations will help pedestrians to cross.

Soft Separation

This is a German concept whereby the road is integrated both physically and visually with the immediate surroundings. The effect is said to change the attitude of the driver towards other road users. This concept is not relevant in this sense to the study area, because there are no focal points of activity through which the road passes. However, the "soft separation" designs can help to maintain the rural character of the road. Indeed, the standard rural highway design on the A36 already employs the concept where there are no kerbs or other solid demarcations of the carriageway.

Vertical Shifts

The traffic and non-traffic characteristics of the A36 are not suited to the introduction of vertical shifts. The high flows of HGVs would be likely to increase noise at such measures, which might not be fully compensated by the noise reduction attributable to the lower speeds.

9 Conclusions

1. The study area contains a section of A36 which is out of keeping with sections on either side, in that relatively little attention has been given to upgrading it. An early decision is required as to whether to upgrade it conventionally or to take explicit steps to ensure that the traffic speed and driver awareness match the continued low profile nature of the road.

2. The length of A36 subject to study is significantly longer than that of most of the VISP study sites. Taken in conjunction with the dispersed character of the village, the heavy traffic flows and the trunk road status, this requires a different approach.

3. The accident experience has indicated some specific problems related to turning traffic which should be dealt with in any case, regardless of any initiatives on traffic calming.

4. Within the requirements to introduce some traffic calming, there is scope for its intensity and the length of treated road to be varied. A range of alternatives has been suggested.

5. A reasonable balance might be achieved by intensive traffic calming of a core section of the road between School Road and Maury's Lane; the rest of the road would have AIP treatments applied in a manner which would encourage reduction of speed ie opportunities would be taken to build in traffic calming features.

10 References

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Appendix A

Annotated Photographs of Overseas Experience

(Not available in this document)